

Personal Power: The iOS Edition

Getting the Most From iOS as a Blind User

by Michael Feir

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Acknowledgements

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forward to presenting him with the direct result of his kindness toward me and others. In the end, I find closure and peace through completing this project and making it freely available.

This guide is the direct result of the need for it, which I eventually came to perceive, plus the generosity that I've encountered in my own journey attempting to master iOS and its ecosystem. Thanks are certainly due to my parents, Dolores and Brian Feir. Whenever I've needed a pair of working eyes, time and patience, they've always been willing to step in. Also, for her tremendous patience and support as I've worked on this project, I thank my wife Sara Feir. I couldn't ask for a better sounding board for ideas and frustrations. A lifelong friend, Stephen Murgaski, was also crucial in this area especially when it came to playing devil's advocate for my various notions.

It was also useful to bounce ideas off of people who were less experienced in the use of their iOS devices. Key people who cheerfully filled that role were Paul Kitchin and Joann Hardy Laframboise. I missed the very beginning of both of their journeys with iOS devices. Joann had already figured quite a bit out on her own before we began to communicate. Paul, my father in law, had already gotten his first iPhone before my wife Sara and I had gotten together. However, in each case, I was able to

get a good sense of what they struggled with and what was easier for them to master early on.

The entire team behind the Kelly and Company show are owed my sincere gratitude for the opportunity to be a regular contributor to the show. Kelly MacDonald, Ramya Amuthan, Matt Agnew, and Jeff Ryman as well as numerous others have built something marvelous to lighten long afternoons. Providing a framework for so many community members and experts to reach blind and visually impaired Canadians in such style is no easy task. The preparation work I did for the past hundred and seventy segments has proved instrumental in building this guide and keeping the project going. Pretty much all of that exploration, enjoyment, and work is done on my iPhone.

Jonathan Mosen is a man who has worn many hats in life. He is known far and wide for writing books that help blind people make use of various technology including iOS devices. His *iOS Without the Eye* series of books, which emerged while I worked on this guide, helped me quickly become familiar with what was new in each version of iOS. Those books saved me a tremendous amount of time and explorational effort. Even more than the books, Jonathan is owed thanks for his constant willingness to share his knowledge when asked. His efforts to help others in the

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Preface

Hello everyone. I wrote this preface because I believe some of you may want a more in-depth explanation about what compelled me to create this frankly mammoth guide and then to ultimately give it away. I have a number of reasons for both decisions. Let's start with why I'm making this guide freely available. Mainly, I think we're in a situation where the people who need this guide the most literally don't know enough to perceive its value to them. This isn't at all a case of willful ignorance or laziness on their part. Rather, the basic premise puts up a huge barrier. The thought of using a touchscreen to do things competently, enjoyably, and independently as a blind person seems at best unintuitive and more likely downright absurd. For blind people who haven't tried an iOS device, it seems crazy paying to learn what might be possible using something with almost no tactile elements to orient oneself.

If you had never seen what things looked like from the top of what appears to be an incalculably high mountain, how much effort would you put into climbing it with the vague understanding that the view would be spectacular upon reaching the top? Would you pay extra for instructions that no sighted people who use these devices need to pay to become competent? I think many blind people who might benefit tremendously from

using an iOS device and accessible apps have approached things with that very naturally skeptical outlook and decided not to acquire smartphones and tablets. Even worse, they went ahead and got these devices thinking that they would be just as intuitive for blind people to master as they were for people who could see. They then grow increasingly bitter because the information they lack prevents their experience from even approaching what was advertised.

By sharing this guide with no financial strings attached, I hope to fundamentally change the equation. I'm not in any way being paid by Apple to do this. Nor am I being financially compensated by blindness organizations who I sincerely hope will help spread this guide to their clients and benefit from it. There are a great many more enjoyable ways and potentially a few more profitable ways I could have spent the considerable time and effort I've put into this guide. What has kept me going is my deep sense of how much joy and fulfillment my iPhone has allowed me to experience. I strongly believe that if more blind people can share in this enjoyment, their gains will enrich their lives greatly. Further, this will in turn increase my own enjoyment as well as that of people who already do even more with their devices than I've ever imagined was possible.

Many people don't share the blessings of family and friends who keep me as informed as I tend to be and give me a measure of safety trying out new things. If these people are going to pay money for apps that might well drastically change their lives, they will first need to be convinced that it is possible; that a flat screen is somehow the gateway to great potential for enrichment of life that is nearly inconceivable before it is experienced. They will need information about the view at the top of that mountain so they know what they strive for. Also, they'll need the start of the climb to be as gentle as possible.

I hope that by making this guide a free resource, more minds will be opened to the magnificent possibilities that I have been blessed to benefit from over these past years. While these opportunities have not, for the most part, resulted in financial gain, they have saved me a lot of money. More importantly, they have enriched my personal life with uncounted pleasures and points of meaningful interaction with others that I would never have otherwise experienced. These things have real value to me, and they'll have value to other blind people plus value to the societies they are more fully able to engage with.

I'm unemployed and on a fixed income. Counterintuitively, part of the reason for my benevolent act is the many rules surrounding this fixed income. When you introduce extra

uncertain income that fluctuates radically from month to month, there's a danger of actually losing more and falling short in a given month as the systems can't adjust quickly. I would need to report any income to two separate government agencies. One of these provides social assistance, while the other makes the apartment I inhabit affordable on that fixed income. Breaking the rules around either agency could make things much harder going forward. Frankly, there wouldn't be enough steady income realized through selling this guide to make it worth the risk. The audience for this sort of thing is mainly blind people and perhaps interested sighted developers and others. We're not dealing with a bestseller here. For all its faults, the social support provided to people with disabilities who can't find work has given me a safe and secure economic and physical space to inhabit. From this vantage point, I can contemplate and execute large projects like this without constant worry about how to survive. Unless a way is found to completely eliminate the need for social assistance, I would much rather see people benefit from my efforts and reap whatever unexpected rewards come my way while moving onto the next project. If there were a way to earn a secure living offering people this kind of help gaining the most enjoyment and fulfillment from their iOS devices and other technologies, I would indeed be very interested. Most especially

if that career didn't involve the pressure to sell products.
I've never felt comfortable in the role of salesman.

What got me started on this gigantic project? The path that led me to decide to write this guide stretches back to the unexpectedly favourable and large response I received after publishing the original *Personal Power* guide and lectures in 2009. I wrote the original *Personal Power* guide to help people who had obtained or been given computers running Microsoft Windows and powerful screen-reading software but who were left without any idea of the many things these computers could help them do to enrich their personal lives. The guide ended up helping far more people than I ever imagined. These people were a somewhat different but no less deserving group than who I wrote the guide for. I was in a South African newspaper, interviewed for several podcasts, and spoke to many online groups interested in what I had done. Add to this thousands of appreciative emails. Many of these were from countries I had never heard of. To everyone who took the time to write me, thank you very much for being the positive proof that my efforts made a real difference. It is largely because of such a response to my initial guide that I felt I could once again step up to the plate and offer something helpful and meaningful here.

By the time I made the decision to get my first iPhone, there seemed to be plenty of help for blind users already available. All my friends, both online and off, seemed to have a good grasp of what their iOS devices could do and where to find out what they didn't know. For several years, I didn't realize how blessed I was to be in a large and well-connected social circle. I don't tend to think of myself as all that special. While I believe that's a good attitude to have overall, it can lead to presumptions that others are equally as fortunate in their company and circumstances. Over time, these presumptions began to erode as I encountered people with iOS devices who were truly shocked when I spoke about a technique, capability or app I had used for years. This included things I regard as absolutely basic and essential to know to do much at all with the expensive devices they owned. For example, a lot of people were never told about the VoiceOver screen reader. Generous friends or family would give blind people iPods, iPads, or iPhones as gifts. They would show them Siri, the digital assistant that you talk to. The presumption of these well-meaning sighted people was that Siri made these devices accessible to blind people. Sadly, most sighted people are completely unaware of the VoiceOver screen reader that actually serves this purpose.

Without learning about and using VoiceOver, the built-in screen reader that Apple includes free of charge with these devices, there are a great many things blind people will not be able to do without sighted assistance. They won't be able to shop in the app store for life-changing apps that would read their mail or tell them where they were. They couldn't review their calendar or reminders. Once VoiceOver has been mastered, these same things, plus a great many more, are easily accomplished without needing any help from sighted people.

The more I looked into why these unfortunate blind owners of the same devices that had made such a powerful difference to me were left out, the less able I was to rest easy in my enjoyment. These people weren't living under a rock or anything unusual. Circumstances had simply worked against their finding out about the growing online community and resources enjoyed by those of us who had been well connected and interested in technology to begin with. It's not caused by any lack of drive or laziness. Rather, it is the same kind of genuine unawareness that results in a blind person slipping on a patch of ice or a handkerchief lying on an already smooth floor.

There is a real digital divide among blind people that seems to have several major root causes; economics is a large part of it. A statistic often tossed around is that roughly 80%

of blind people are unemployed. If money is tight, you're not as likely or able to try new technology unless you have enough experience or information to understand how helpful and/or cost-saving it will be in the long run. This information is out there, but it's still a case of being connected to the right people or organizations who are forward-thinking enough to stay informed. Sometimes, direct experience is the only way to be convinced enough to invest time, effort, and money into something new. While iOS devices are widespread, the knowledge necessary to demonstrate the VoiceOver screen reader or knowing which apps are accessible and easy to grasp for beginners is less common.

Another big reason is conceptual. At a purely intuitive gut level, it seems absurd that a device with a touchscreen would be at all useful, much less truly coveted among blind people. Knowledge of how VoiceOver and other accessibility features work isn't widely spread among sighted people who sell these devices. Everyone knows about Siri, but comparatively few know about VoiceOver, which is the built-in screen reader developed specifically for blind users. There's no widespread sense of how capable it is and how many totally different apps it makes accessible to blind users. Without such information, it's hard to make a very good case to a potential blind owner. Harder

still for that owner to conceive of the possibilities without being able to try things out.

The summer of 2016 was a pivotal one. During those hot months, my wife Sara and I attended a reunion at the W. Ross Macdonald school for the blind in Brantford, Ontario. Had it not been for her involvement with the school alumni, I might never have gone to one of these reunions. During that occasion, I had several key conversations with fellow attendees that would have far-reaching effects on what this guide has ultimately become. Later that Summer, Sara and I went on a week-long trip to visit our good friend Stephen Murgaski. I had decided to leave my laptop at home and simply bring my iPhone and accessories along. I had begun using it for writing my blog entries and was contemplating starting a more serious writing project using the Ulysses app. I didn't miss my more bulky laptop at all that week away. I could do everything I wanted to with the iPhone and a Bluetooth keyboard I still use when travelling to this day. I remarked on this to Steve during one of the marvelous conversations we always have while together. He does a splendid job at being devil's advocate. We explored the potential gains and shortcomings of using an iPhone as a computer replacement over the rest of the week. While I failed to convince him that I was right beyond my own personal use case, we discussed a broad

range of situations and areas of utility. This exploration has deeply impacted my approach to this guide. he has been a good friend and sounding board for my approaches to explanations throughout the writing process.

A couple of other pieces fell into place during that trip. One of these was listening to an audiobook by Chuck Klosterman called *But What If We're Wrong*. In this book, Chuck explores the premise that we might one day look on things we're very certain of now with the same scorn and derision as we level against notions from the past that were once certain but have been disproved. Notions like the premise that Earth was flat and stationary with the rest of the universe moving around our world. He covers a series of things such as which pop culture would ultimately stand the test of time and areas of physics that might undergo radical changes in understanding such as gravity, etc. He puts forward the idea that we can be trapped within a false sense of certainty made stronger by living in an age of so much shared information. Reading this book put me in a good frame of mind to examine all my thoughts that there was sufficient available help for blind people who had iOS devices but weren't as well connected as I was. Perhaps, I was wrong, and it wasn't due to simple indifference and apathy. Perhaps, there were other causes I hadn't considered. Maybe, my vantage

point was more skewed by a social bubble I hadn't even been conscious of as it formed around me.

The final push came through hearing from a volunteer who had read some remarks I had made about the KNFB Reader app. He wanted to put me in touch with a lady named Joann who he thought I might be able to help. She had an iPhone but had never been shown how to use VoiceOver. She had also never learned of the KNFB Reader app. Nor had the representatives of an organization helping blind people who she had contacted. Once I had returned home, Joann and I had a number of conversations over the rest of the summer. These gave me a far better grasp of how lucky I was to have the resources and friends that I do. Joann also clearly illustrated to me how tragically likely people were to remain ignorant of the very resources I had taken for granted and presumed everyone knew about. Very quickly, as I explained the various aspects of iOS to her, I sensed the need for a guide like the one I have written here. Had I never learned about or talked with Joann, this guide would never have happened. Her situation gave me the final push and radically changed the three and a half years it has taken me to bring this project to a satisfactory conclusion. She provided me the newcomer's perspective that all my experience and skill had largely robbed me of.

The scope that this guide seeks to encompass is very different from a traditional user manual. Essentially, I am attempting to present the wisdom and experience I've gained through having used an iPhone to enhance my own life over the past decade. Rather than be a manual, I want this guide to be a resourceful, encouraging friend to new blind owners of iOS devices. Much of this has been made possible through various apps created by developers from around the world who have chosen to make their apps accessible to blind people.

Apple doesn't provide a lot of starting instructions for anyone really. In a book I thoroughly enjoyed recently on my iPhone called *The One Device* by Brian Merchant, one of the creators of the iPhone, commented that the prevailing thought was that if you had to ship a user manual, you had already failed to create a compelling device. For a very large slice of the general public, this philosophy really seems to have been correct. People who can see do find these products quite intuitive once they get started. When my father bought his iPad, a helpful salesperson made certain he understood how to navigate and knew where to find the manual in the Apple Books app. Back then it was called iBooks. This didn't take longer than ten or minutes. For blind people to receive comparable assistance would, frankly, require considerably more time. I would want at

least an hour to go over basic concepts and teach enough for someone to then be able to take their device home and have a satisfactory experience exploring the capabilities of their new device on their own.

Even if a salesperson shows a blind customer how to get into Apple Books, it is doubtful they know enough about VoiceOver to give useable instructions on how to obtain, navigate, and read the user guide freely available in Apple Books using VoiceOver. A "Getting Started" card that helps sighted people know enough to learn through experimentation comes with iOS devices. However, there is no such card for blind users. This is a profoundly unfortunate situation, since neither the possibilities nor operating techniques are anywhere near as intuitive at the start.

This is particularly the case when blind people are given these devices as gifts or when they are ordered online. I've talked to blind people who heard how accessible iOS devices were supposed to be, ordered an iPhone online, and then had to find sighted help to even get it turned on and set up to the point where they could use Siri. Unless such sighted help was familiar with the Accessibility section in the Settings, they wouldn't know about VoiceOver or other accessibility tools built into iOS.

Adding to the problem, organizations supposed to help blind people simply weren't as aware of developments as I had presumed them to be. Given the many incredibly useful apps and possibilities like GPS guidance, object identification via the built-in camera, and apps capable of reading printed pages in mere seconds like KNFB Reader, it seems criminal that this was ever the case. Particularly sad and more often the case in more remote areas like northern Ontario. Even if someone is given or obtains an iOS device, there's nothing that makes certain that they are given a chance to learn about VoiceOver. There is no built-in tutorial. There really ought to be one for VoiceOver that is present on every device and waiting for customers in need of it. If, by chance, you thought to look in the VoiceOver settings found in Settings, Accessibility, you would find a very meagre explanation. This leaves blind beginners at a sharp disadvantage as they struggle to grasp the basics of making effective use of a touchscreen without being able to see it.

Thankfully, this landscape of ignorance has drastically improved since I started this project. Blindness organizations and agencies have truly awakened to the potential contained in smartphones and tablets. There are now all sorts of training initiatives and programs to help blind people obtain both the devices and the training needed to get started. I'll steer you

to some of these many resources in a section at the end of this guide.

Knowledge of communities like www.applevis.com where blind people can find out about accessible apps as well as tutorials is not very widespread among the general public. This means that even if blind people figure out enough to get online, they don't know where to go. The user guide available in Apple Books would be helpful provided that a new blind owner was aware of Apple Books and understood how to use it.

Presuming you gain knowledge of VoiceOver and the skills to use what's already on your iOS device, there's yet another uphill battle that I really hope this guide helps blind people win. The expression "There's an app for that!" has become very familiar in the sighted world. If accessible apps were as widely talked about and advertised as popular and accessible games and apps, blind people might connect the dots as many sighted people do and think to check the app store to see if there's an app that will do what they require. Outside of initiatives like Blind Cool Tech, AppleVis, and Blind Bargains, however, not a lot of attention is usually paid to apps made especially for the blind. Also, there is as yet no way to search specifically for apps that are known to be accessible to blind people and support the VoiceOver screen reader. While a collection of "apps that

support VoiceOver" can be found under the Quick Links heading in the app store, it's a small and very infrequently maintained collection.

For example, nothing was there to tell me that the app that my bank developed for people to use was accessible to me as a blind person. Given past experience, the natural assumption would be that I'd be wasting my time trying it. Yet, when I did try it, I was amazed at how very intentionally accessible it turned out to be. It's even better and more convenient than the completely audio telephone banking I used for decades. I haven't called that number in years now thanks to this banking app. The developers even responded to constructive criticism and improved the app's accessibility over time.

Sadly, people are still vastly more likely to come across inaccessible apps if they do decide to look around. The path to satisfaction and real competence is far easier to find for sighted people. I'm quite certain that if my father decided one day that he wanted to garden, fish, brew beer, or damned near anything else, he wouldn't have to try very hard to find an app that would be in some way helpful to the endeavour of his choice. For blind people attempting the same thing, they must also determine whether an app is accessible with VoiceOver. The description of an app often makes it seem like a certainty that

it would be accessible. However, after purchasing the app and running the word processor or calculator, or the text-based, story-driven game that piqued their interest and sounds like it ought to be accessible, they find that it in fact isn't at all useable for them. The new blind user may quickly stop experimenting if he or she finds too many inaccessible apps before being pointed to the thousands of fully accessible ones. Nobody who makes accessible apps has the advertising budget to make it generally known that blind people can use them. Therefore, they might never discover that their bank's app is as accessible as mine turned out to be. They might never find a writing app that suits their needs if they start with the idea that it isn't worth trying to look for accessible apps that absolutely exist. They might never delight in the extensive efforts by many developers to create welcoming, accessible experiences for blind users who dare to venture into the world of the touchscreen.

Meanwhile, for sighted newcomers, it's easy to become downright overwhelmed with information about apps that are totally useable for them. The possibilities are seen everywhere from popular TV shows to ads seen on Facebook while playing games. A major objective I have in writing this guide is to

point blind people to a great many fully accessible apps so they have positive initial experiences with their iOS device.

All of these barriers can leave blind people walking around with very powerful life-changing devices that they can barely use at all. They don't know what they're missing out on. Nor, most likely, do those who help blind people accomplish things that they, if properly equipped and informed, could easily do for themselves. This unfortunate circumstance bothers me deeply, nagging at my conscience. Especially when all that it would take to solve the problem is having the right information available. Precisely the situation I found regarding Windows computers when I wrote the original *Personal Power* guide. Sadly, history really does repeat itself.

In this case, the sense of missed opportunity is exponentially more profound. There's no outcry because the dots simply haven't been connected in the common mind. It's different for me. Those dots are very much connected. I know that there is a lot of potential for good among blind people who have thus far been left out of the growing community taking advantage of this new portable economic space. If these people are let in, everyone wins. They will have an affordable means of engaging with the online world. The more blind people there are who use these devices, the greater our engagement with the online world

and our economic leverage will become. They simply need a boost up the initially steep learning curve to a point where they're connected with the online community of helpful people and resources.

Although I've discovered a lot on my own over the years of using my iPhone, I write this guide while standing on the shoulders of generous giants. Please take the time to explore the resources I've listed in the Helpful Resources section located at the end of the guide. Many of these resources were around to help me get started on my own journey with iOS devices. A good many other friends and family helped get me out of jams my explorations got me into. You can read a little about them in the Acknowledgements. Consider this guide to be my way of passing the generosity that I experienced onward.

If this guide enables someone to connect more with the people around them, share their enthusiasm and interests online, express themselves, travel and exercise with greater confidence, or enjoy the many digital entertainments that I've been blessed to enjoy, then I will count this project a success. I will consider myself even more richly rewarded if readers of this guide choose to share their talents, personal interests, and knowledge with the online community I have hopefully enabled you to connect with. Tell us about your discoveries of accessible

apps or techniques for getting things done using iOS. Share your adventures in the form of reviews of apps and postings to blogs or social media so that others can benefit from your success. Be a positive part of the online world that I've come to appreciate. Having that world grow richer and more vibrant through your efforts and shared experiences will be reward enough for me.

In my quest to share what Apple has made it possible to equip myself with, I lack the resources and infrastructure to distribute this guide in alternative formats to those who would benefit tremendously from this being done for them. All I can really do is set this loose on the Internet in the hope that the right people will find it and pass it on to where it'll do the most good. Please pass this guide to whoever you think should read it. If I had my way, it would be on every iOS device owned by a blind person and would be as simple as possible to access and learn about. Any organization or library for the blind should feel free to post this guide in any format. All I ask is that I be given proper credit for my work and that the content not be changed beyond whatever is necessary to produce this guide in alternative formats or make it easier to navigate.

Introduction

On the first of February 2011, I took what felt like a bit of a gamble. My mother had broken her cellphone and needed a replacement that was fairly basic and easy to use. I had a phone that would suit her. It had raised number buttons on it so that I was able to dial numbers with it. That was the whole reason I had bought it. However, all of its other features were utterly inaccessible to me. She would make much better use of it presuming there was a more accessible option out there for me. I had previously been given an accessible cellphone designed for blind people that had physical buttons and synthetic speech. This had let me send and receive texts, use the address book, and perform other functions common to earlier cellphones. Unfortunately, it stopped working rather suddenly and proved impossible to get repaired. The phone I was now planning to donate to my mother had been purchased in a hurry. When your phone is what you use to let people into your apartment and you mainly shop online, having a working phone is about as essential as things get. I was happy to have something with a raised keypad. I never would have expected that two years after that frantic purchase, there would, indeed, be a more accessible phone that blind people would be raving about.

From what I had heard, the iPhone, despite having a flat buttonless touchscreen, was nonetheless the new, amazingly affordable, accessible option for blind people. On a fixed income, the only way I could afford this gadget was to sign a three-year contract with the phone carrier I still use today. Unlike other options, that contract would cost me the same as any other sighted person who bought an iPhone. I wouldn't have to pay a cent to make it accessible for me. That was an absolutely monumental selling point. Provided I could really cope with the touchscreen effectively, I'd gain some tremendous capabilities if what my friends and online acquaintances had told me was true. I had no real cause to doubt them. They're a fabulous and thoughtful bunch of people. It was just that the kind of stories they told of having wonderful experiences on a touchscreen despite being totally blind seemed so out there. Was it really possible to quickly answer a phone call on a device where you couldn't feel the right button? How on Earth would you type in a password while browsing the web? How quickly could you really do things competently when time was of the essence?

This was such a big change in how blind people did things that signing the contract was a tad scary. Before reaching this point, I had prepared as best I could. I had learned about the still new AppleVis community formed by blind people who had made

this leap of faith a year or more before me. I had also acquired a book of instructions written to help blind people start using these things effectively. I signed the contract and was handed my new iPhone 4. Lifting it, I was surprised at how light and thin yet solid it felt. It was just as I had been told it would be; a flat, thin and totally smooth rectangular slab. To people with sight, I presumed it looked somehow fancy and sophisticated. For me, it felt rather like one of those smooth small cup coasters that your drink all too easily slides off of if you don't set it down very carefully. Had I just done something beyond daft?

The salesman and my father got the initial setup completed for me. I found out later that even in those early days, I could have done this by myself and that it would have talked right from the start. I was then able to tell them how to turn on VoiceOver. This was a screen reader that Apple had included free in its iOS operating system that made it possible for blind people to use their smartphones. My father understood that the iPhone had a screen reader that would make it possible for me to use. In contrast, I don't think the salesman actually knew about VoiceOver. When I started figuring out the very basics standing at that shop counter, the realization that the iPhone was talking to me about what I was touching amazed him.

Gaining real competence took a couple of weeks of trying out various apps and learning good technique performing the various gestures. At the start, I sometimes declined calls I meant to accept and made other mistakes. However, it was apparent after less than an hour of use that I would actually be able to master this smartphone and use it efficiently. It was just a matter of practice and time. Thus began my journey to competence, unimaginable capability, and endless amusement all to be had from a small flat slab easily pocketed or held in one hand.

If you had told me ten years ago that I would one day walk around with a flat rectangular device in my pocket that could tell me where I was, identify groceries using pictures I took with a built-in camera, let me play games I never dreamed would be accessible, could read printed pages in mere seconds, and allow me to carry over a thousand books in my pocket, I would have laughed long and hard at you. The idea would have struck me as utterly preposterous. Even after a year of owning my iPhone 4, I never would have imagined that I would one day be sitting on my apartment balcony on a warm summer afternoon writing a guide using an iPhone 7 rather than the laptop sitting unused on my desk mere metres away.

Until you experience these things, it seems like something from science fiction. The last ten years have totally changed my perspective. The iPhone, which I never go anywhere without, has steadily increased in capability as new accessible apps are created to take advantage of the technology housed within. It is undeniably the most versatile and downright useful piece of technology I've ever had. Let me be your guide into a whole new paradigm of connective, powerful, and affordable accessibility. Through this free guide, I hope to make your journey to competence using iOS devices much easier, less costly, and more enjoyable than my own was. Perhaps, I can add a measure of the delight that some of my stumbles cost me as I mastered my iPhone.

Make no mistake. This is not a manual. Those valuable documents are written with people in a heaping hurry in mind. Others have already written those, and I haven't set out to reinvent the wheel. Think of this more like a traveler's journal and guidebook written for people with time to explore and make the most out of wandering through a new place. I focus just as much on giving you a sense of what's awaiting your possible interest as on explaining how to get around. I view both as being equally important. Rather than a crash course, this is more of a leisurely tour given by someone who deeply appreciates

what he's found and wants others to share in that enjoyment. Hopefully, you'll never find yourself reading through long stretches of instructions without having an idea why you might actually want to know how to do something. I want my readers to have a good sense of what's possible for them as early in the learning process as can be managed. You, my readers, should feel comfortable going in your own direction and pursuing your own interests long before reading more than a small fraction of this document.

I haven't written this thinking that people will read it all the way through like you'd read a novel. Instead, I've written this with the presumption that people will skip over what doesn't interest them at the moment and read sections out of order. Maybe you have already heard a lot about the Apple ecosystem, and someone has told you what the buttons on your device are. If this is the case, you can skip right to the section on VoiceOver and get cracking. Perhaps, you already know how to navigate the iOS operating system and simply wonder what interesting things I've found. There are hopefully some treasures here worthy of your attention too. I've included numerous lists of podcasts, apps, books, games, and even musical favourites. I don't consider such things to be fluff. They've taught me things, brightened my days, and given me motivation

and reason to use my iPhone to the fullest. I hope they will give newcomers to this digital world somewhere to start enjoying. You'll also find other meandering asides such as when I discuss social media. Rather than just giving you the bare bones of how to use various apps, I try to illuminate the perils, pleasures, and pitfalls that I've found while using social media of various sorts. When I discuss security, I tell you about the various options and also about why you should care about available options and measures taken on your behalf. I want my readers to have the best possible chance to truly thrive and become responsible considerate citizens of the online world. That requires more than just knowing how to do things with your iOS device. You need to have a sense of context to understand and choose how, why, and when you might want to engage with the online world.

Consider this guide to be your friend, teacher, and tour guide. Turn to it whenever you get stuck, curious, or confused. You might not find coverage of exactly what you're trying to do. However, you'll almost certainly find the necessary skills discussed as well as something comparable to what you're doing. Through examples drawn from my own personal experiences, I'll help you understand why blind people have made the leap and why you, too, may want to. I'll take you on the incredible journey

Apple's iPhone has allowed me to travel. You will have a far better grasp of the possibilities of your device and can determine what capabilities are worth your effort to master.

I don't presume that everyone reading this will want to do everything with their device that I have with mine. I also don't believe I've learned anywhere near everything there is to know. Hopefully, this guide can be a steppingstone allowing you, my readers, to discover new possibilities and bring them to my attention and share them with the quickly growing community of blind users. I'd like more blind people to be able to use these devices to help them live even more engaged lives than my own.

There are many areas where an iOS device may be helpful that fall outside my enthusiastic interest. I have endeavoured to go beyond my own areas of competence and interest to create a more helpful and comprehensive resource. When we come to areas where I feel it is warranted, I will explain where I feel less competent so that you may better judge what I say about apps and capacities available on iOS devices to get help from people better informed in these areas than I am.

This guide has three levels of headings to help you get where you want to go. Headings at level one divide the guide into major sections. The preface is one such major area. The next is the introduction you now read. Subsequent sections go

into greater detail about the iOS operating system and your built-in screen reader VoiceOver. There's no need to read the major sections in order. However, I recommend you read the sections about iOS and VoiceOver before going very far into the rest of the guide. There are many key concepts discussed in those sections that it helps to be familiar with right away before you start to explore the apps already on your device and those developed by people all over the world. Second-level headings divide major sections into subsections that focus more on important concepts but are still a part of the overall area of interest. For example, the "rotor gesture" has its own subsection within the major section devoted to VoiceOver. Second-level headings may also serve to denote a shift of focus onto different but similar apps within a major section. Third-level headings are used to begin shorter noteworthy items within a subsection. These items precede things like detailed descriptions of a gesture or a list of step-by-step instructions on how to perform a task within an app. Other times, third-level headings will mark places where different areas of an app or different options are discussed in detail. Things proceed in that fashion as required. The higher the level of heading, the more granular the focus will be. Those of you wanting the "how to" steps and lists should be looking for third-level headings.

The order of major sections was carefully considered to maximize the ease and enjoyment of learning. We start out with familiarizing you with the VoiceOver screen reader and iOS operating system so that you have a sense of what to do when we discuss other apps and capabilities in a more casual fashion rather than complete step by step instructions. Beyond that, I feel that it's important to convey the staggering possibilities for fun and entertainment these devices open up to us. The section on accessible games is, therefore, found in the first half of the guide rather than being tacked on at the end. These devices are as much about fun as they are about accomplishing things and connecting with people. Too often, blind people are introduced to technology as a means of work, leaving them resenting the technology rather than enjoying it. That simply won't happen on my watch. Other areas of entertainment are positioned to break up more serious groups of topics. Also, where it makes sense to do so, related major sections are placed one after another. These thoughts were all in mind as I came up with the order of presentation.

This guide attempts to make learning about the iOS operating system more manageable and less overwhelming by breaking up the experience into constituent parts. Many aspects of it such as the app store, Siri, Settings, etc., have their

own separate sections. This will hopefully allow you to focus on each aspect as you need to and not feel that you must grasp everything all at once before starting to use your device in earnest. I think that it's important to start using your device to pursue your own entertainments and interests as soon as possible. Long before I knew much about iOS, I was already buying apps, taking notes, answering phone calls, setting reminders, and checking the weather.

There is another absolutely crucial piece to the puzzle of how blind people can maximize the benefit and enjoyment they get from iOS devices. Finding the apps that are accessible to blind people among the countless apps available can be a discouraging hunt particularly for beginners. The app store has no really good mechanism for flagging apps that offer VoiceOver support. What's more, app developers often don't have much of an advertising budget or know where to spread the word they've created apps that are accessible to blind people. While I can't wave my magic wand and fix these ongoing circumstances, I can, and have, taken what actions I'm able to in this guide to mitigate them. To this end, I have used some third-party apps as examples when explaining how some concepts work where this makes sense. The use of these apps will be thoroughly described and explained. Many sections of this guide are completely about

third-party apps that are fully accessible. Games are a perfect example of this, as none are included with iOS itself to await your pleasure right from day one. If any interest you, they will be available in the app store unless they have been retired from the store since this guide was written. This absolutely will happen over time. However, any techniques discussed will be applicable to other alternative apps.

I have also incorporated app store expeditions throughout this guide at the end of major sections. These are all second-level headings found at the end of a major section. I will point my readers to apps that are known to work well with VoiceOver. The apps or other resources covered in such expeditions are somehow related to the section above. These apps or other resources are briefly reviewed and described but learning how to use them is largely left up to the reader's own initiative.

As improvements are made to iOS and various apps, the precise methods for achieving things may change. As new versions of iOS appear, overall concepts taught in this guide should remain largely valid. However, some of the specific steps and methods may no longer apply as improvements are made. More lasting than the "how-to" are the basic possibilities, capabilities, and concepts that iOS devices make use of. Those tend to remain the same. Similarly to my first *Personal Power*

guide, I hope that this also stands the test of time remaining largely useful years from when it was completed.

Not all change in the world of iOS is positive. iOS 13 has proved to contain a good many serious bugs. Despite a flurry of updates since its release, many issues remain unresolved including some that effect the VoiceOver screen reader. In this guide, I describe how features are supposed to work but often may not due to these glitches. The spellcheck rotor feature is a personally painful example as I conclude work on this guide. If you try something repeatedly and find that it doesn't work, keep in mind that you may be dealing with a bug rather than your own lack of skill or experience. Apple has taken drastic steps to improve iOS development in light of these bugs, which range far beyond accessibility issues. I have high hopes for a much smoother experience with iOS 14. Meanwhile, be patient with yourself and your device and hang in there.

I'm always keen to hear from my readers. Any thoughts or questions are most welcome. Email or Twitter are the best methods for making contact with me. On Twitter, my username is mfeir. My email address is michael.feir@gmail.com.

There are times when I get quite a lot of emails and tweets, so please be patient. Remember that I'm doing this on my own time. Nobody paid me to produce this guide or answer

questions from whoever reads it. I love to help people and will do my best to respond to everyone in timely fashion. However, there are other projects and activities in my life that also deserve my attention. As long as you remain civil and considerate of this, I'll be happy to help. However, I won't hesitate to block and report abusive behaviour. That said, I hope you enjoy the rest of this guide and look forward to encountering you online.

Quick Start

Note: This Quick Start section gives a bare minimum of instructions needed for blind owners of iOS devices to start using them effectively. The reader is strongly encouraged to read further in this guide and/or seek more instructions elsewhere to fully grasp the potential of their iOS device and learn how to optimize their experience. Three resources are mentioned later in this section. Many more can be found in the section called Helpful Resources located near the end of this guide.

Orientation

If you have an older iOS device, it may have a round concave button at the bottom of the touchscreen. This is called the Home button. Hold your device with this button nearest to you. On the left and right edges of the device, there are long thin buttons. The button on the right edge is the Power On/Off button. The shorter buttons along the left side are Volume Up/Down. Along the bottom near the Home button, there is a small port called a Lightning port. This is used for charging your device and also for connecting accessories like EarPods. More current iOS devices do not have a Home button. However, they will still have an Action button on the right side and Volume

buttons on the left. To turn on your device, find the single button along the right or top edge of your device. This is the Action/Power button. Push and hold it in for around four seconds and then release. This should activate your device presuming the battery is charged. Plugging in your device or properly placing it on a wireless charging pad is a certain way to cause your device to turn on. If your device is plugged in, there will be a small chirp when it has finished booting and is ready presuming that the mute switch on your device is set to unmuted and the volume is above minimum.

Setup

These instructions presume that sighted help is available or that you have experienced help at hand. For more detailed instructions suitable for blind beginners who need to set their device up on their own, go to the final second-level heading in this Quick Start information.

Your device has a built-in screen reader called VoiceOver that makes it useable for blind people. Presuming your device is powered on, the first thing to do is activate this feature. If you are setting up your device, it may not be connected to cellular data or WiFi. In this case:

1. Press the Home button three times very quickly. If your device doesn't have one, press the Action button on the right side three times in quick succession. This will cause VoiceOver to activate during the setup process. If you want to be able to activate and deactivate VoiceOver in this manner after setup is complete, set the Accessibility Shortcut to VoiceOver. Find it in Settings, Accessibility. This

should be done as soon as possible once setup is complete so that blind users can always restart VoiceOver regardless of connectivity circumstances.

2. During the setup process, you may hear your device begin to say "hello" in English and other languages. The easiest way of getting past this is to use the Back button found in the top left corner. This will exit the language selection process, and setup will proceed with the default language for the region your device determines itself to be in. Otherwise, you can find and double tap the button that says "hello" in the language you wish when that language is currently displayed on that button.
3. Follow the instructions to set up your device. Read them by flicking left or right with your finger to go forward and backward. Tap twice quickly on things you want to interact with. When typing, double tap on an edit field to enter it. VoiceOver should say "is editing" when ready to type. The default method of typing is called "standard typing". Feel around the onscreen keyboard until you find the letter, number, or symbol you need. Then, tap twice quickly to enter that character. Alternatively, you can hold your finger down on the item and tap with another finger anywhere on the screen. There are three alternative methods of typing to choose from as you gain proficiency.
4. When creating an Apple ID, choose carefully. You can use an email address you already have, if you prefer, and need not use iCloud for email. Choose a password that is *easy to remember*. It is your key to *everything*!
5. The same goes for a passcode, which is like a PIN number you might choose to secure your device. Choose a number you won't forget.

If you purchased this device in a store and there is help available to set things up, it is even easier to activate VoiceOver. Once you are connected to cellular data or WiFi, do the following:

1. Press and hold in the Home or Action button until a beep is heard.
2. Say: "turn on VoiceOver".
3. The device should then say "OK. I turned on VoiceOver".
4. Press the Home button to return to the home screen. If your device has no Home button, touch the bottom of the screen. Hold your finger down once you've heard a short low beep or tick. You'll also feel a slight bump. Slide your finger upwards until you hear a higher short beep, and then lift it from the screen to return to the home screen.

Now that VoiceOver is on, your device will behave in a manner more suitable for sightless exploration and operation. Be aware that this will make it harder for sighted people, since they are used to different gestures and behaviour. Touching

anywhere on the screen will read what is directly beneath your finger. Unlike other screen readers, VoiceOver doesn't simplify screen layout. Instead, it facilitates blind navigation and exploration.

Basic VoiceOver Gestures

Tapping twice quickly with four fingers spaced slightly apart will activate VoiceOver Help mode. This mode lets you practice gestures and announces what they will do when performed outside of Help mode. When you're finished with Help mode, a four-finger double tap will exit. Pressing the Home button also exits Help mode but also exits whatever app you might be working in, bringing you to your current home screen. VoiceOver should speak short instructions such as "double tap to open" as you move around the screen. If you don't hear such advice, go to the Verbosity section in the settings for VoiceOver and enable Hints.

Touching anywhere on the screen will speak what is displayed. To activate an item or choice, tap twice quickly on it with one finger. This is called a one-finger double tap, since you are performing two quick taps with one finger. Alternatively, you can examine the screen with one finger and select or activate things by holding your exploration finger on the desired object and then tapping anywhere on the screen with

another finger. This is called a split tap. Another very useful gesture to know right away is called a two-finger double tap. This involves tapping twice quickly using two fingers at the same time. This answers and ends phone calls or causes audio such as music to pause or resume.

You can explore the screen by flicking your finger left or right. VoiceOver will move to each element starting at the top left and moving across and downward to the bottom right row by row. Flicking downward with two fingers causes VoiceOver to read continuously from the currently selected position. This allows continuous reading of books with automatic page turning. During such reading, a single tap using two fingers will pause and resume progress. Flicking with three fingers left or right will scroll one page in the opposite direction of your motion. Flicking left or right with four fingers will switch between apps you currently have open.

The Rotor

This gesture is essential for efficient use of VoiceOver. Take two fingers and imagine there is a small knob on the screen. Place the tips of your fingers on the screen as if you were grasping a knob. Rotate your fingers clockwise or counterclockwise as if you turned a knob. This will bring

different settings and options into focus. An alternative method for turning the rotor is as follows:

1. Place a finger from your left hand anywhere along the left side of the screen and a finger from your right hand across from it on the right edge. Your two fingertips should be pointing at each other.
2. Move one finger upwards while moving the other downwards. For example, move your left finger upwards towards the top of the screen while your right finger moves downwards towards the bottom. Both fingers should move at the same time. This will turn the rotor one selection to the right. Moving your right finger upwards while the left moves downwards will turn the rotor to the left.
3. To interact with the option selected by the rotor, flick up or downward with one finger. This will change the value of the option. For example, if speech rate is selected, flicking upwards will increase the speed, while flicking downwards will slow speech.
4. While learning how to use your device, remember to leave the rotor on a safe option such as Characters or Words. This will prevent accidentally disabling Hints or changing volume or speech rate. Be aware that in an effort to be helpful, the rotor will automatically set itself to the Actions setting if you move onto an element that has options available.

Settings

The Settings icon is on your home screen. Double tapping it takes you to where you can configure all aspects of your device. Many settings are found within subsections of the main collection of Settings. Flicking left or right will navigate through Settings. Double tapping on a desired item will activate it. Should you wish to back out of a setting or subsection, find the Back button located at the top left of the screen, and double tap this with one finger. Many settings are toggles that can be on or off. Double tapping on these changes their state. If a setting says "button" after its value is stated, double tapping on it won't deactivate the setting. One such example is

the settings for VoiceOver found within the Accessibility subsection of Settings. To get there:

1. Flick right through Settings until you reach Accessibility.
2. Double tap the Accessibility option.
3. Flick right through these settings until you reach the VoiceOver option. It should say "VoiceOver on button". This indicates that VoiceOver is activated and that double tapping its option will move you into VoiceOver settings rather than deactivating it. Other major settings work similarly.
4. When finished making adjustments, you can exit the Settings area by pressing the Home button or invoking the equivalent gesture on current devices with no Home button. This returns you to your home screen. The next time you enter the Settings app, you will be placed where you were when you used the Home button to exit or will simply find yourself in the top menu of Settings.

The App Switcher

Pressing the Home button twice in quick succession puts you in an area called the "app switcher". To reach this area on devices with no Home button, place your finger at the very bottom of the screen and slide it upward until a third high-pitched beep is heard. At that point, lift your finger and you will arrive at the app switcher. Flicking left and right will scroll through any apps you may have used and left open. Double tapping on the name of an app will take you into that app. Flicking upwards with three fingers will cause an app to close, and the app will no longer be active. The next time you open the app, you will start in a default position rather than where you were in the app when last you used it. Note that your place in books will be automatically preserved. When you return to a book, you are placed at the point where you stopped reading it.

Obtaining Further Instructions

There are many different sources of help for blind users of iOS devices. One of the best starting places is www.applevis.com. This website is home to a thriving community of blind users keen to share their discoveries and expertise. Check out the tutorials, podcasts, and directories of apps.

Another excellent free and thorough tutorial website is www.hadley.edu. There you'll find instructional videos and tutorials to help get you started with your iOS device.

Finally, Apple Inc. has produced electronic user guides for all of its products. You can get the appropriate guide for your device free of charge and then read it using an app called Apple Books. This app is found on your home screen and serves as both bookstore and personal library.

How to Get and Read Your User Guide

Find the icon called Books on your home screen. Double tap it with one finger to cause Apple Books to open. You start out in the Reading Now tab, which is empty until you obtain books. In all of Apple's store apps, there are tabs across the bottom, which, when double tapped, expose different areas. In this case from left to right, they are: Reading Now, Library, Book Store, Audiobooks, and Search. At the top of the screen, there is an

action area whose content changes based on the tab you have selected.

There are two approaches to finding specific books:

The first is to look in the Book Store tab. Turn the rotor to where it says Headings and flick down to advance through sections. The Top Charts section always contains one or more of these guides. Specifically, you want to find the Top Charts Free heading. Next, flick right to have the available books read out to you. You'll likely come to a See All button before finding the guide. Double tap this and then flick right through the revealed expanded chart of the most popular free books. You will almost certainly come across the *iPhone User Guide* or the guide for your iPad or iPod Touch. Apple is very consistent with its book names for these. When you find the correct user guide, double tap on that button to bring up the entry for that particular book. The entry will include title, price, author, and other information including a book description. To acquire the book, start at the top left of the screen and continue to flick right. Listen for a button that will say "get". This guide is free, so there is no price. Double tap on the Get button to signal your intention to get the book. It will then require you to double tap the button a second time to confirm you want the book. Next, you will be asked for your Apple ID password. If you

have enabled Touch or Face ID, this may also be used to authorize purchases. Even acquiring free items are treated exactly the same as purchases, but no money is necessary.

A second approach is to choose the Search tab. After double tapping the Search tab, touch the top left of the screen and flick right. You'll come to an edit field where you can input one or more terms to search for. Double tap this to indicate your intention to type in that area. VoiceOver will say "is editing". A keyboard has now appeared on the screen, and you may type text into it. Feel for the desired letters and enter your device name such as iPhone, followed by a space, followed by the words "user guide". When finished, find the Search button at the very bottom right corner of the screen. Because you're in an edit field, the tabs are not shown. Once you double tap the Search button, your device will execute the search. Touch the top left of the screen and flick right. You should quickly come to the appropriate user guide. As before, double tap the title to go to the book entry. Find and double tap the Get button. Follow the rest of the purchase procedure to acquire the guide. It will then be downloaded into your library.

To read your guide, find and double tap on the Library tab. Touch the top left of your screen, and then flick right until you come to the title of the user guide. It will be the only

book in your collection. Double tap on the title to open the book itself. You are now in "book-reading mode". The action area at the top left of the screen below the status bar has buttons to help you navigate your book. The button at the top left is Library, and it will exit your book returning you to your library. Flicking right once gets you to the Table of Contents button. Double tap this to browse through the sections, flicking right to scroll through them in order. Double tap on the section of the guide that interests you. Had you kept flicking right, the Search button would let you search for key words to quickly find areas of particular interest. Once you've selected a section, double tap on its link to be taken to it. Feel slowly downward from the top of the screen until you come to text such as the name of the section you've chosen. At that point, using two fingers slightly spaced apart, flick them downward together on the screen to start your book reading continuously. Use a two-finger single tap anywhere on the screen to pause or resume continuous reading. Using the rotor, you can also read by character, word, line, etc. This can be useful to determine how things are spelled.

Setting Up Your Device

In an ideal world, there will be someone who is trusted, knowledgeable, and helpful to make setting up your device

easier. Entering information correctly is important during the process, and this can be nerve-wracking. However, there is an increasingly likely possibility that you will have to set up your device from scratch by yourself. As I revisit this section in March of 2020, this has become a distinctly more likely scenario due to the rapid and deadly spread of the Coronavirus. Retail stores and Apple stores are closed down as I write this, so online shopping is the only way to go these days unless you receive a device as a gift from a charitable organization, friend, or family member. Provided that you remain calm and exercise patience, it is absolutely possible to set up your device right out of the box all by yourself without the need for eyesight. While writing this section, I did this with my iPad to make certain I would walk you through the process correctly. Posthumous thanks to John Morgan are definitely in order. Having a device available that I can initialize and set up repeatedly while writing about the process on my iPhone was incredibly useful.

Make yourself comfortable. It is very helpful if you can be within range of a WiFi network you are allowed to make use of. Presuming you have cellular data capability, a cellular network is another option, but WiFi is strongly recommended in case you need to install operating system updates or any such thing. Sit

somewhere close enough to a power outlet so that you can use your device while it is charging. Before we begin, plug the device into the power brick. For some devices, you will find the power brick has its prongs folded into itself. The prongs need to pivot into their open position, which you can accomplish easily with a finger. Next, attach the cable to the power brick. You'll find a small port on the power brick opposite to where the extended prongs are. Plug the larger end of the cable that came with your device into this port. Next, plug the other end into the very small port on your device. It's a small slot typically located on the bottom edge at the very centre of its length. You're now ready to plug the power brick into your electrical outlet as you would any other appliance. Once you've plugged it in, be patient as it should now be turning on and booting up. Assuming you're in a quiet place, you'll hear a short "bing" sound. If your device supports haptic feedback, you'll also feel a small pulse of vibration at the same time you hear the sound. This means the device is on and knows that it's charging. You may need to wait a short while longer, perhaps half a minute, before the device is ready. It may start saying "hello" in different languages. Either way, after this wait, it should be ready for you to begin the setup process.

Now that you're physically ready, let's prepare you mentally. You should be ready to spend at least half an hour, possibly as much as an hour, but certainly no more than that. Don't do this when you're in any kind of a hurry. Also, it's important that you don't panic if you make a mistake. You can always use the Back button at the top left of the screen to go back to the prior step. Also, there is a Delete key on the onscreen keyboard. Feel around the bottom right of the screen until you find it. Keep your finger on it and then tap anywhere on the screen with another finger to remove a character you didn't intend to enter. There are around fifteen steps, but some of them are just to read and then continue past screens containing important information. You are allowed to skip steps including those related to security measures. However, barring special circumstances, I strongly recommend that people go through all steps. You will then end up in the most secure and best possible starting position. There may be additional steps specific to the features and capabilities of your specific device that I haven't covered. These will be explained by your device during the process. For more details on security features such as Face ID, see the section on security later in this guide. You should also read the Quick Start section so you

understand typing basics, etc. Are you ready? Then let's get started.

1. Turn on VoiceOver. To do this, find the Action button located on its own along the edge opposite or above the two volume buttons. Quickly click this small sliver-like button three times. You should then hear something spoken, most likely the Back button or the currently active language.
2. You should now be at the point where you need to select the language, country, and region you wish to operate in. It will likely default to the most common language wherever you are. In my case, this is thankfully English, as I know only halting French. To select an option, tap it twice quickly or hold a finger on the option while tapping once elsewhere on the screen with another finger. Do this for any further options as we proceed. Once the language is set, flick right and you should either come to a place to select your country, or else find a Continue button that will take you to where that is. Once you've told your device where you are, proceed to the next step.
3. The next order of business is to join a WiFi network. Flick right through the list of detectable networks and tap twice quickly on the one you want. You will then be asked for the password to join that network presuming one is needed. Type this in.
4. You should then come to an information screen all about Apple's stance on privacy. It explains what Apple uses your information for and allows you to access further information about this if you desire. Read this by flicking right to proceed through sections. When finished, find the Continue button.
5. Next, you will be asked to set up whatever biometric security option your device has. In the case of my iPad, this was Touch ID. Meanwhile, on my iPhone XR, it was Face ID. Go through the process and keep in mind that you can always do it again later once you're finished setting up your device. If you feel nervous, you can always skip this step. Flick right and you'll find an option to do this.
6. You will now be asked to create a passcode to keep your device secure. This is typically a six-digit number. You will need to enter in your chosen number twice, which makes certain that it is what you intend. Choose a number that you will remember, since you'll need it to unlock your device among other things. Think of it like the key to your house.
7. Next, it's time to create your Apple ID. Simply fill in the form providing all of the information requested here. If you prefer, you need not use an email address specially created for you by Apple. If you prefer, you can use an email address you already have. Any information from Apple will be sent there. I use my Gmail address. When you choose a password, pick one that you will remember, rather than one that's impossible to guess. You need to be able to remember this and enter it whenever you're asked. Keep it written down in a handy location if you need to.
8. Now that you've created your Apple ID, it's time to select some preferred settings. These involve such things as using Siri. Don't forget that you can always change your mind about any decision you make. After setup is complete, go into Settings, and you'll be able to make different choices if you wish.
9. It will now be time to set up Apple Pay. If you wish, you can skip this step. However, setting up Apple Pay by adding a credit or bank card will then allow you to obtain apps from the app store among many other things.

10. At this point, you'll be asked whether to allow sharing of audio recording to improve Siri. This lets Apple employees hear your commands and teach Siri how to respond better.
11. The next step explains about screen time. You need not worry about this for the time being, so find the Continue button and proceed.
12. You will now be asked if you want to share information with app developers and Apple. This is not personal information, but is information gathered about how an app is used to improve its functionality.
13. You must now choose whether you want a light or dark appearance. Choosing "dark" may extend battery life but will make no difference to a totally blind user beyond that.
14. At this point, you will go through a series of screens that each explain gestures needed on devices without Home buttons. These gestures are vital, and you should pay close attention to the information here. Proceed through these screens until you reach the final step.
15. You have now reached a screen that welcomes you to your device. Double tap the Get Started button. You will be taken to the home screen. Congratulations! You have completed the setup process.

Your iOS Device and Accessories: Choosing and Examining Your Ticket to Ride

Perhaps, you've ordered a device from Apple, and the sturdy cardboard box is in your hands. If so, enjoy that unique smell that will waft out when you open it. I enjoyed this experience somewhat sooner than I had planned on during the late summer of 2019 when I upgraded to an iPhone XR. Maybe you're holding an already-used device given to you by a friend, family member, or charitable organization who think it will enrich your life as a blind person. If so, explore that flat glass surface and feel the port and sliver-like buttons found along the edges of the device. Lift it up in your hands and get a sense of its weight and balance.

We begin our journey focusing on the range of hardware that runs the iOS operating system. Any iOS device is going to be a smooth flat rectangular slab with minimal buttons and switches on the side, and a connecting port on the bottom edge. Past this common idea of the screen, which can become anything necessary to the moment, the similarities are less certain. Things differ depending on the processor and storage capacity, biometric security features, and other things housed within that technological sandwich of glass and aluminum you now hold.

Right from the start, your choice of device will have potentially major ramifications on what you ultimately choose to use your iOS device for and what apps you decide to acquire for it. For many people, this section's first part will be useful right away to help choose your device and understand its basic layout. Later in this section, we'll look at some accessories you may choose to acquire to maximize the usefulness of your device. Thanks to the Bluetooth capabilities built into your iPhone, iPad, or iPod, there's a lot of choice in that space. In fact, there's so much choice that we'll spend more time in the section discussing these accessories than we'll spend discussing iOS devices. This is mainly because iOS devices are so very similar to each other in terms of design and overall function. From speakers to headphones to protective cases, Bluetooth keyboards, and external batteries, there's bound to be something affordable and useful to you that will enhance your overall experience.

I have written this section hoping to help people better understand the implications of the device they might already have, or else help prospective purchasers figure out which device would best suit their needs and budget. For a more thorough grasp of what you're getting into, please also read the section that immediately follows this one called The iOS

Ecosystem. The hardware is the foundation of your experience. The digital home you build on that foundation will better suit you if you understand the economics and philosophy behind the services and software developed for this particular hardware.

Increasingly, people are having their first experience with the constantly evolving iOS ecosystem on older second-hand devices. These are quite often still fully functional at the point when their initial owners wish to upgrade to newer devices. This further increases the uncertainty I must try to accommodate when discussing the hardware you may encounter. Recently, the CNIB has launched an initiative called Phone It Forward to encourage donating older iOS devices for blind people so they can take advantage of the many accessible apps available. This is a tremendously good thing, since it gives those who can't otherwise afford it a way into the iOS ecosystem and access to all of the many benefits this confers. I absolutely applaud this and other similar initiatives that may exist in the world. However, I am concerned that people might not understand the ramifications of being unable to update their version of the iOS operating system to the latest release once the processor chip in their device becomes too old to be supported. Past this point, your device will certainly still function. However, being unable to receive iOS updates has

serious implications. Apple fixes security flaws and offers improvements to the VoiceOver screen reader along with other improvements in successive updates to the operating system. There is no way to update the capabilities of VoiceOver separately from other aspects of iOS. Moreover, app developers stop supporting older versions of iOS, since doing so takes effort and resources better spent in other ways.

Being an owner and user of an iOS device puts you on a kind of economic treadmill. Presuming you like what iOS has to offer, there will eventually come a point when you'll need to upgrade to a more modern device. Quite often, people upgrade their devices long before they're at the tail end of being useful. Blind recipients of donated devices will very much benefit from this tendency. Just be aware that, eventually, you'll either be tempted to upgrade your device to gain new capabilities or be forced to upgrade to a newer device when the one you have ages. More on this later.

Processor and Storage

Before we discuss each kind of device, there are two crucial factors common to all of them that will have the most drastic consequences to your overall experience as a blind user. These are the processor your device contains as well as how much storage capacity is built in. There is no way of upgrading

either of these aspects of your device short of upgrading to a newer more capable one. You're essentially stuck with what you have onboard until you're ready and willing to upgrade to a newer device. Let's examine each of these important aspects in turn.

The Processor

The processor or "chip" inside your iOS device is what gives it computational power and speed. Don't think of it as a single component. These are systems on a chip and include a tremendous array of very small components that allow your device to function. These include multiple processor cores that allow your device to do many different things at once, often in the background, while you attend to other things. With each new model of device, Apple introduces substantially more capable chips. Beyond being simply faster and more efficient, these new processors may have new components that introduce capabilities that older chips simply won't have. For example, the A10 Fusion chip contained in the iPhone 7 introduced a multiple core approach with two high-performance cores and two high-efficiency cores that use far less power for tasks that aren't processor intensive. When I upgraded to the iPhone 7 on which this guide was begun, I certainly noticed how much faster it was and how more capable of handling multiple tasks at once without freezes

and lockups it was. When I upgraded to my current iPhone XR, I once again noticed speed improvements as well as much better power management. The battery charge lasted substantially longer, and things happened a lot more speedily.

As blind people, we won't notice the visual improvements that the graphics processing components facilitate. However, graphics are still happening on our screens or virtually as apps run. The more efficiently this can happen, the less of a strain the system and battery will be under. Responsiveness is something we will most certainly notice as we go about our various tasks. The A13 chips in the 2019 series of iPhones and iPads give these devices speed and power equivalent to modern game consoles, which are some of the most capable consumer-oriented computing devices available. This facilitates augmented reality and artificial intelligence applications that are quickly emerging. The artificial intelligence capabilities have far-reaching implications when it comes to how your device responds to you with suggestions and recommendations as it learns more about your preferences and interests. These capabilities may also aid in object identification and character recognition among many other things of use to blind users.

Most of the time, the improvements to speed and other capabilities gained when you upgrade a single generation of

processor won't bowl you over. That's because most users aren't doing things that truly push the chips in their devices to their limits. However, these changes do add up over time. When my wife Sara upgraded from her iPhone 5S to the XR she currently uses, she remarked on how much faster it was. It also didn't freeze up or have apps crash anywhere near as frequently even when many apps were running in the background. Usually, improvements to the processor are felt over time in small ways. Some apps really need the capabilities of a certain generation of chip as a minimum. People with older devices simply won't be able to use these apps at all. Games and other apps designed to perform intense tasks like audio or video editing are prime candidates for this. Most apps will merely take a little more time to work on older devices. Such lag will be especially noticeable when you're doing a lot at once on older devices.

The more modern the chip in your device is, the longer it will enable you to receive new updates and versions of the iOS operating system. Generally speaking, this will give you more time before you'll need to invest in a newer device. You pay up front for peace of mind going forward. Most major updates to iOS will make you thankful to get them as improvements to accessibility, and improvements in other areas can be quite substantial.

Storage Capacity

Your iOS device will come equipped with a "solid-state drive" that lets you store apps and other data that you create or obtain. Any information stored on this drive will be available regardless of whether you are connected to the Internet via cellular data or WiFi. Solid-state drives have no moving parts and are, therefore, more resistant to impact or shock damage than conventional hard drives. They also require less power. Solid-state drives are capable of finding, reading, and writing information nearly instantaneously. All of these traits make them the best choice currently available for devices like tablets and smartphones.

There is no slot in your device for its solid-state drive. They are built in and cannot be replaced except possibly by Apple should the need arise. The customer must choose the amount of storage at the time of purchase and live with the consequences of this choice thereafter. As of late 2019, the highest possible capacity available is 512 gigabytes (GB) on the latest most expensive iPhones, or 1 terabyte on the most expensive iPad Pro. The minimum is 32 GB, which is found on older devices. Upgrading to the next level of storage typically adds around \$100 US to the cost of a new device. On modern iOS devices, the minimum available storage has been set at 64 GB.

That may not sound like a lot compared to the storage available on even the cheapest laptops. However, you'll be surprised how far this will go when combined with Cloud-based services. Particularly with smartphones, the whole idea is that you're always connected to inexpensive Cloud storage and the Internet. You may therefore simply retrieve information when needed.

In practice, due to the cost of cellular data, it is wise to have more storage onboard your device than the minimum possible. Many people I know started thinking they would only use their device for checking emails or browsing the web. Within the first month, they were doing far more than that and having to delete music or take other measures to manage the space on their devices. Personally, I much prefer to have music, audio dramas, books, and other digital possessions stored on my device ready for use. Due to this, I often had to pick and choose what took up space on my iPhone 7 with its 128 GB of storage capacity. I could certainly cope with less capacity but wouldn't enjoy having less storage on a future device. In fact, I invested the extra money to have the next higher level of storage, which effectively doubles the amount to 256 GB on my iPhone XR. I have already put most of this capacity to good use. I'm now able to keep more audiobooks, music, and other resources onboard and ready at all times. I've escaped having to really

decide what kind of overall use I put my iPhone versus other devices towards. Those who have less than 64 GB of storage will have to consider whether they want to do most of their audiobook reading on their device or whether they want their music collection on tap ready to go. While using her iPhone 5S, Sara frequently found that she didn't have enough storage space for everything she wanted onboard such as apps and audiobooks. Thankfully, she has plenty of space on her iPhone XR and shouldn't need to worry about storage capacity very often at all.

A major upgrade that comes with iOS 13 is a far more robust capability to handle files and use external storage with your iOS device. These include flash drives, SD cards, file servers, etc. It is possible now to integrate these external file repositories into the Files app, where they'll act similarly to iCloud drive storage. This is similar to how Windows computers can access files on SD cards, flash drives, etc. and treat them all the same allowing for easy copying and movement. These external storage methods can relieve some of the issues around not having enough onboard storage.

Common Aspects of iOS Devices

All of these devices are rectangular in shape. Some have a round indented button near the bottom of the touchscreen called

a Home button. These buttons are actually sensitive small round button-like areas that don't press in. However, tactile feedback is given through a vibration motor in the device that gives the sensation of pressing a button. It can take a bit of getting used to.

Devices that lack one of these virtual buttons will make use of cameras and sensors located behind the top of your device's touchscreen to scan your face. This is how they will verify who you are to unlock or approve purchases among other uses.

iOS devices are all quite thin but rigid structures composed mainly of special glass and metal. They can break if dropped. The first thing I obtain for a new iOS device is a case to protect it from accidental falls. The very first day my father owned an iPad, he stood in the driveway of my brother's house and tried to take a picture of his grandchildren. He accidentally dropped the iPad on the driveway, and it cracked. It was the first time they saw their grandfather cry. Thankfully, Apple was wonderfully kind and replaced the broken iPad at no cost. It could have been a very expensive object lesson. I recount the story above so others may learn from it. Your iOS device will find its way into your daily life in countless ways. Protect your investment.

Along their edges, iOS devices have short Volume buttons right near each other on one side. Above these is usually a switch that allows you to mute the device. Along the top or the opposite side of the volume buttons, you'll find another similar sliver-like button called the Action button that is used to shut off, lock your device, or perform other operations not done via the touchscreen. These buttons feel like thick slivers that protrude ever so slightly outward from the edges. The bottom edge of your device features a small slot where a charging cable is plugged in. On older devices, there will also be a jack for EarPods or other headsets or microphones. Other than that, the rest of your device will be a flat featureless surface. It is a touchscreen. Tiny sensors under the surface can tell where one or more fingers are touching it. This lets you do a surprising number of things.

iPods, iPhones, and iPads: What's the Difference

It all comes down to capabilities and physical size. iPhones are a range of smaller, more portable and in some ways, such as having built-in cellular data and GPS, more capable devices. They can fit comfortably inside a pocket. iPads, on the other hand, are larger tablets whose main attraction is a substantially larger touchscreen display. The Pro line of iPads offer significantly more computing power than iPhones. However,

the cheaper kind of iPad, simply called "iPad," offers a slightly less powerful chip than comes in mid-range iPhones.

Being connected to the Internet is a major strength of these devices. If you choose the iPhone, you will be able to connect using your cellular data. iPads may be equipped with cellular capability for a higher price. However, they can't then be used as overly large cellular phones. You would pay for a data plan and use the data for working online while out of range of WiFi connections. Having the capability to connect to cellular networks is simply built into every model of iPhone from the start. Some people will buy iPhones and then only use them while connected to WiFi. This is certainly a more portable approach and adds the benefit of built-in GPS. However, the abilities you gain by investing in a data and phone plan are substantial. Being able to communicate and use apps that leverage online services and artificial intelligence from wherever you are is absolutely revolutionary and of immense benefit to blind people.

Overall, any kind of iOS device will allow you to use the same apps. Newer devices without Home buttons have some different gestures and uses for the Action button that you'll need to master. There should be no major cause for concern that your choice will disallow you from using apps. However, there

are cases where a special version of the app was developed for the iPad to fully take advantage of its additional resources or display size. A case in point is Fantastical 3, the calendar and reminder app I particularly like. The majority of available apps are universal, meaning they'll work on either device, but they may change how information is displayed depending on which device is used. Which option is best for you will depend on what your abilities and needs are. Let's explore the differences and advantages of each kind of device.

iPods: These devices are the least expensive and least capable, all things being equal. They are for people who don't need a phone, don't require the latest and greatest processor, and don't want a larger tablet that won't fit in their pocket. People have often described iPods as being iPhones without the phone. However catchy and succinct this may sound, it doesn't really do the situation proper justice. They are less costly than iPhones, because many different corners are cut to keep the cost as low as possible. Depending on your needs, these missing capabilities might prove troublesome enough to be dealbreakers. On the other hand, they don't come with the costs associated with cellular contracts and data plans. You could purchase an iPod and use it in libraries or other places where WiFi is made available to the public. Think of an iPod as the bottom rung of

the iOS ladder. The brand-new iPod released on May 28 of 2019 features the same A10 Fusion processor that powers the iPhone 7 released in September of 2016. This puts the latest iPod around four years behind the latest generation of iPhones that run on A13 chips. They connect to the Internet via WiFi only. iPods do not have GPS chips, so if you wanted that capability, you'd need a Bluetooth GPS receiver. Another thing iPods lack is any biometric security measures. This means they lack some capabilities such as Apple Pay that require the security provided by Face or Touch ID.

iPhones: These devices are by far the most famous. They are fully featured pocket computers that also happen to be cellular phones. In addition to WiFi, they can also access the Internet using cellular data. They have GPS and other sensors built in such as accelerometers. They are also equipped with very capable front and rear cameras. There is currently a wide array of iPhones available from Apple ranging in price from around \$300 Canadian to over \$1,000 for an absolutely cutting-edge, top end iPhone. Many people acquire their iPhones through different cellular carrier companies that subsidize the up-front cost by offering contracts. In Canada, these typically span two years and spread the payment for the device out over that time. While this ultimately costs more money than purchasing an unlocked

device outright, it can prove easier for people on tighter budgets who find it hard to have enough money at one time. It's very much like buying a house.

iPads: The basic idea behind an iPad or other tablet is that it's a sheet of glass that can be whatever you need it to be. It can show you the page of a book you want to read, become a word processor, display photos, let you watch movies, or be your portable game system. Anything you might want. Rather than paying a bill each month for cellular service and data, blind people wanting to use iOS apps might choose to pay for an iPad or iPod and use it with WiFi in their homes or elsewhere. This is certainly a less-costly option, as the only expense incurred is when you eventually wish to upgrade to a newer device. However, you give up a degree of portability and gain a larger display that won't be as advantageous as it can be for sighted people. This is particularly true if you have spatial intelligence difficulties like I do. For me, it is far easier to conceptualize where everything is and develop a good degree of muscle memory using my iPhone's much smaller display surface. Sound produced from the speakers on higher end iPads will sound substantially better than from the speakers built into smaller iPhones and iPods. However, people who want high quality sound

will hear precisely the same thing on any kind of device if they use Bluetooth headsets, earbuds, or speakers.

While you can use the same apps, the experience will differ more than might be anticipated. The operating system and gestures are the same, but the app layouts and position of the keys is very different on iPads versus iPhones or iPods. I have spatial difficulties, and this has made using an iPad substantially harder for me. There's more space to have gestures go crooked and be misinterpreted. I'll try to do a three-finger swipe and have it misunderstood unless I manage to do it very straight. I've also found that double taps with two fingers may be interpreted as a tap with one finger if they're too close together. Also, more things are in the same screen, since the surface area is so much larger. For sighted people, this means a lot fewer taps and swipes to get where they want to be. For blind people, it means figuring out where more things are crammed into the same space. With good spatial awareness and mental mapping skills, this will be a possibly large advantage much as it is for people who can see. For me, it's proving to be very frustrating. I've used an iPhone for about eight years and often don't have to consciously think about where things are due to muscle memory. On my iPad, everything seems in a different place. It's like switching to a new Bluetooth keyboard. It's

still a QWERTY layout, but the shift keys are different or the spacebar is small. Old habits are hard to break, and things are so similar that the differences throw you all the more. Had I been using an iPad since day one, I might perhaps not feel quite the same frustration. I would presume that people who choose an iPad will eventually gain a similar competence to what I have on my iPhone. It's a matter of developing muscle memory and an understanding of how apps are typically laid out to take full advantage of the substantially larger screen. Past a certain point of competence, you won't have to put as much effort into learning how to use apps efficiently, since you'll have absorbed the basic conventions on where controls and interface elements tend to be.

A good example of this sort of different layout is the Settings app. On the iPhone, things are neatly separated into different areas. You double tap to go into Bluetooth settings, for instance, and those Bluetooth-related settings will be all that remain on the screen. You'd then use the Back button to get out of that area and back to the main settings. On the iPad, it's set up like a tree with all Settings branches visible on the left side of the screen and areas of focus opening up on the right side as you double tap a branch to select it. Flicking over the screen becomes a much less efficient means of

navigation on an iPad's larger display. You need to think spatially a whole lot more to get anything done quickly. Flicking left and right is still useful, though, since you can touch near what you want and then flick over to it.

The larger size of an iPad may prove to be a real boon for Braille users. They will be able to use something called Braille Screen Input far more comfortably than on any iPhone. This basically lets you position your fingers on the touchscreen like you would on a Braille writer and enter Braille characters rather than using the normal onscreen keyboard. Instead of learning where all the normal keys are, you can place your fingers comfortably on the edge of the screen and enter Braille characters. I find this especially good with the iPad in landscape mode. This gives you the maximum length to find a comfortable position for your hands and quickly enter Braille characters. No iPhone will give you as long a side to work with as an iPad. I'd never use Braille screen input on my iPhone because my hands are too large to get them comfortably positioned on my much shorter iPhone 7. On my slightly longer iPhone XR, the spacing of my fingers is somewhat closer to what I remember typing on a Perkins Braille writer, and I'm somewhat faster. The longer edge of an iPad allows me to truly find a comfortable hand position for Braille input as suitable as

possible to my particular hands and finger spacing. My wife Sara has smaller hands and finds Braille Screen Input very useful on her iPhone XR. I haven't written in Braille seriously since my days in secondary school. For me, it's faster than using the onscreen keyboard but way slower than using my Bluetooth keyboard. However, I can appreciate what a big advantage this is for people who write in Braille all the time.

When choosing your iOS device, here's something else to think carefully over. iPhones have GPS receivers built into them. If you go the iPad route, you will need to purchase an external GPS receiver to use navigation apps like BlindSquare or Nearby Explorer. These apps will use data to supplement GPS information with up-to-date maps and points of interest drawn from online sources. An iPad won't be able to do this without cellular data available. You'd have to preload any information while on WiFi before you started to travel. Also, it's much easier using an iPhone while on the move than trying to use an iPad while walking. On the other hand, maps have a larger display area on an iPad and may be easier to comprehend. Presuming they can be obtained or explored while in range of WiFi connectivity, this may prove a workable solution for iPad users. The Nearby Explorer app stores maps and points of interest on your device, so provided you had a GPS receiver,

this would be a robust if battery-draining approach to navigating with an iPad. An iPhone has everything built in, so there wouldn't be the extra device to carry and worry about its own battery charge.

The cameras on iPads are quite good, but it's harder to position them when doing OCR on a sheet. Apple didn't think that cameras on iPads would be used like those on iPhones. The iPad throws a shadow over the page, and the camera is in the top left corner of the large rectangular slab of an iPad you're trying to wield. An iPhone is far easier to hold in one hand over or near an object or page. If identifying objects and reading print pages is important to you, I strongly recommend an iPhone over an iPad. It's certainly possible to use an iPad for this kind of thing. Apps like Seeing AI and KNFB Reader will absolutely work, but you have to put more thought into positioning the camera and light conditions to get good results.

One aspect often seen as a major advantage of iPads is the ability to have multiple apps open and working on the same screen. The size of iPads means that there is enough room to display more than one app at once in a useful manner. This can be used in countless ways. You might work on a document while having your notes open and available in a separate app. Perhaps, you want to write an email while still keeping an eye on a show

you're watching. That's very easy to accomplish for users with sight. Blind people can also make use of this kind of multitasking. However, they had better have more spatial skills than I do. I've never been successful at using this capability. It's far easier for me to switch between apps displayed one at a time.

Device Longevity

I like my digital home to last a long time. I get comfortable with my computer or iOS device and don't relish the prospect of changing to a new one just for the sake of having the latest and greatest. Provided you remember your Apple ID and password, you need not worry about losing anything. Once you purchase an app, ebook, album, etc., it can be downloaded onto a new device with ease. The lifespan of these devices depends on how careful their owners are with them. Setting that aside, I have found that they typically last and perform quite satisfactorily around four to five years. Having no moving parts aside from a very few buttons, there's not much to really break given appropriate care. During that time, you will receive free iOS upgrades that will improve how your device functions. They can work longer than this, especially now that Apple has increased its focus on having iOS support older devices for a longer time than previously. However, they will eventually be

unable to keep up with advances in iOS, which is the operating system that runs them. When this happens, you won't be able to update to current releases of iOS. Apple supports older devices going back at least a few generations, so if you're happy with what you have, you can keep using it and updating your version of iOS until Apple eventually stops supporting it.

To give you a sense of possible longevity, Apple released the iPhone 4S in 2012. It began its life using iOS 5.02, and people were able to upgrade to the latest version of iOS until iOS 9.36, which was released in 2016. When devices reach the end of their useful cycle, they will become more sluggish and have a harder time using the current iOS version. Long before this point, most users would be tempted to upgrade to newer devices due to rapid improvements in their capabilities. These include everything from longer battery life, faster processors, better displays, better cameras, audio improvements, and cellular data improvements among many other possibilities.

I expect that my iPhone XR will serve my needs quite adequately for a good four or five years without difficulty. Eventually, I expect that I will need to have the battery replaced, since they wear out over hundreds of charging cycles. It is possible that other components such as the storage drive will wear out. However, it is far more likely that my iPhone

will suffer physical damage, and that this would occur before I wanted to upgrade anyhow due to capability advancements.

Sometimes, features that are introduced take a long time to be widely adopted. One example of this is something called Apple Pay. This is a system taking advantage of a kind of transmitter in newer iPhones and other iOS devices that can transfer payment information to equipment in restaurants and other places supporting the system. You authorize payment with your fingerprint or face when you want to pay for something. No more digging out your credit card and using those little inaccessible payment machines. Very nice for blind people provided the system is actually supported where you want to do business. It took quite a while before Apple Pay was widely adopted in Canada. I have only made use of it on a few occasions partially due to how long it took to be widely supported by restaurants and shops. This is one example of why it is sometimes better to wait while new features mature before upgrading. Another is the new 5G wireless network upgrade set to arrive soon. I suspect that integrating and fully exploring the capabilities such a major network upgrade will make possible may take a generation or two of iPhones as Apple learns to maximize its utility. Meanwhile, my XR should continue to meet my needs barring disaster.

Accessories

Included with your device, you will find a cable and power brick for charging the built-in battery. The small end of the cable fits into the Lightning port on the bottom of your device. It's a kind of small slot. When properly inserted, it will noticeably click into place. The other end of the cable can either be plugged into the USB port of a computer or charging hub or into the port on the small charging brick. The brick is a good option, because it contains technology to help make certain your iOS device doesn't overcharge. Many other third-party chargers also have this facility.

You may also find a set of EarPods. These are Apple's improved version of earbuds that are sculpted to better fit in the ears of most people. They also have a microphone housed in the tiny control set that you'll find hanging below your right ear when wearing them. There are three buttons on the controls. The control set feels like a thin cylinder with a flattened section in the middle. The top and bottom buttons flank the flat central portion and will raise or lower the volume when pressed. The flat central button has a number of functions. Pressing it will pause or resume playback. Should you receive a call, you can use that button to answer or end it quickly. Clicking it twice rapidly will skip to the next music track or audio file

you may be listening to. Holding it in will invoke Siri, a digital assistant available to owners of iOS devices.

This small group of accessories will prove more than sufficient for getting started. Indeed, some people never feel the need to equip themselves further in terms of accessories for their devices. It all depends on what you choose to do with your iOS device. Should any of these accessories break or wear out, you can easily obtain replacements from the Apple store. You can download the Apple Store app onto your device and order replacements or spares using that app. There are many alternative sources for these accessories such as Target, Amazon, and local retail stores. I would recommend that at the very least, you get a spare charging brick and Lightning cable as well as a spare set of EarPods. Cables do fray or break if they become snagged on things.

Accessories Beyond the Basics: Leaving Your Laptop Behind

As iOS devices and apps have improved, the notion of leaving the laptop behind and using your iOS device plus portable accessories grows more tempting. As I finish off this section in early 2020, I have long ago crossed over that line. For over two years now, my laptop is used only at home while my iPhone XR and a small light bag of accessories comes along with me nearly everywhere I go. Generally speaking, I don't miss the

laptop at all. However, part of the reason for this is that I'm very familiar with how to do things on iOS. If you're just learning the basics, keep the laptop handy until you've grown comfortable with iOS and any accessories you choose. To achieve the same speed as when using a laptop, you need to know VoiceOver gestures as well as what your options are in terms of the ideal apps for what you want to do. This isn't a transition made overnight. You will initially take longer to do things until you become more proficient with the iOS environment.

There are an overwhelming number of accessories and plenty of choices in all categories. These include different cases, external batteries [often called power banks], speakers, headsets, earbuds, keyboards, etc. Accessibility for blind people is not often a consideration when these are designed. However, there are devices that are more accessible than others by sheer accident. Especially when it comes to headsets and speakers, there are increasingly good chances that you'll end up with something that has voice guidance and talks to you. Also, more Bluetooth accessories are able to report their battery charge level to the battery widget you can have in the Today view on your iOS device. Below, we'll look at some accessory choices I've made and how I approached them. Your travel kit will likely differ from mine depending on your specific needs,

budget, and priorities. Never presume that I've found the one and only option or, indeed, even the "best" option available. I have plenty of unused souvenirs that I once had high hopes for.

Adding to the difficulty of selecting the best possible gear, it's hard to try before you buy when it comes to physical accessories. Sometimes, you can go to a store and find demo units available. However, most often, there won't be that option as stores don't want to open items and then not be able to sell them. This is especially true for less expensive items. Perhaps, you'll be lucky enough to have a family member or friend who has taken the risk before you and has an accessory he or she is happy with. Often, there will be information making its way around the blind community about particularly accessible or affordable accessories that are workable by blind people. Following in the footsteps of others is certainly a relatively safer choice. However, don't make the mistake of thinking that all possible options have been explored. You might very well take a chance and come away with the next smash hit accessory unheard of in the blind community.

Much of the time, you'll be ordering accessories online and relying completely on reviews and descriptions found there. This is especially true if you include devices that are being crowd funded on Kickstarter or Indiegogo. You can come across some

very innovative ideas there. For instance, one idea that came up during the writing of this guide was called a Power Cap. Funded on Kickstarter, it was a hat outfitted with solar panels and small rechargeable battery. A good thought in theory. Just because a large company hasn't thought of exactly what you might want, that doesn't mean someone with the skills and resources isn't trying to fund production and get started. Crowd funding has proved to be a very effective way of funding products aimed at niche markets and devices that are sometimes more accessible to blind users. You also have the opportunity to ask questions of the creators and backers who are able to see any pictures or videos about the product you're backing. Just be aware that things don't always turn out as well as might be wished. I'm typing this paragraph on a perfect case in point. It is a well-constructed mechanical keyboard called a Hexgears X1. It has a tactile on/off switch, reports its battery status to my iPhone, and is physically about as well designed as I could want. The only problem is that every so often, such as when I typed the "i" in "its" earlier, a keystroke fails to register. This seems to have something to do with how the Bluetooth connectivity works. I don't have this problem on my smaller Microsoft Universal Mobile keyboard I talk about later in this section. I still use the X1 here at my desk as a keyboard for my laptop. I

wasn't so lucky with a pair of small round Bluetooth speakers I backed on Kickstarter. Those are now buried in a desk drawer due to the creators implementing a power-saving mode that puts the speakers to sleep whenever no sound is playing through them. This means that they must awaken each time VoiceOver starts speaking if no other sound is coming from them. You therefore miss the first part of words while the speakers wake up again. For pure listening, they're perfectly fine, as one very happy niece of mine will attest.

Thankfully, there are reviews and descriptions of pretty much everything on the web. Mine them for the info you need to make the most informed choices possible when selecting your gear. Written reviews, podcasts, and video reviews are all very useful tools. Even if you can't see the video, reviewers tend to describe important tactile aspects in passing. You might also hear any sounds made by accessories such as how keys or buttons sound when pressed or voice prompts spoken by accessories. Look beyond what the manufacturers say. Chances are good that someone has tried what you're interested in. Learn from their experience whenever possible.

Why not a Notetaker or Laptop

Inevitably, people will ask why you'd go through all the bother of acquiring accessories to overcome shortcomings of your

iOS device rather than just taking a laptop or notetaker. It all comes down to portability, ease of repair, and economics. If something goes wrong with your laptop, you're completely out of action digitally speaking. It's a single unit that, if it needs repair, you'll have to do without any of its capabilities in the meantime. If your keyboard is damaged, you could certainly attach a Bluetooth or USB keyboard. However, if you want the one built into the laptop to work properly, you'll have to spend some time without the whole thing while it's fixed. Meanwhile, your iOS device is already a powerful enough computer for most student or travel needs. The iPhone further gives you a fully accessible smartphone plus GPS capability in a single pocket-sized device. Information is stored in the Cloud, so the risk of information loss is very minimal should disaster strike your iOS device. The accessories are individually far less expensive to replace if necessary. If you send a broken Bluetooth keyboard away for repair, you aren't missing the rest of the capabilities of your iOS device while it's being worked on. Also, there are usually inexpensive accessories like the AmazonBasics Bluetooth keyboard, for instance, that you could purchase if desperate.

Once you've found the gear you really love, it will likely last as long or longer than your iOS device. Accessories such as batteries, speakers, and keyboards typically last a long time so

need not be replaced when you upgrade to a new iOS device. When it's time to upgrade a laptop or notetaker, you're generally replacing the entire device, paying a substantial amount of cash to do this. Having external accessories last potentially long enough to be used with several iOS devices maximizes economic efficiency, so you can pick your moments when it comes to upgrading various components of your overall system. Very good for people on tight budgets. For example, I'm waiting for improvements promised by Bluetooth version 5 to make their way into the next generation of speakers. Once that happens, I'll think about replacing the speaker I currently carry. Otherwise, I have confidence that the Fugoo Tough speaker in question will last as long as I need it to.

The iOS ecosystem is far more economical than others. Apps are often far less expensive and take advantage of the work Apple has done adding accessibility features to the operating system. You can make use of many of the same apps everyone else does. They need not be specially produced for blind people. That lowers the cost of adding capabilities to your iOS device like you wouldn't believe. It also makes relating to sighted people who use the same iOS devices easier. Sharing information, communicating, and tapping into the same markets for digital goods like books, music, and apps as everyone else are huge

advantages blind people simply haven't experienced before iOS devices became accessible.

Bluetooth Keyboards

For me, finding a really good and affordable Bluetooth keyboard has become an ongoing obsession. On a laptop, you will in all likelihood stick to the keyboard already built into it. This is especially the case while travelling. However, when you want a physical keyboard to use with an iOS device, you're starting from scratch and the options are endless. Typing fast enough to take class notes on an iPhone or iPad is pretty much impossible for most of us. People with very good muscle memory might possibly manage. Feeling around making certain you have the right character slows me down considerably. Don't even think about trying to use Siri to dictate your notes in a classroom setting. Touchscreen keyboards are good for writing short emails, notes, and contact info, but for serious rapid sustained writing, a tactile keyboard is a must.

Finding the perfect keyboard for your specific preferences can be a quest worthy of an epic poem. The pitfalls are plentiful. I've now tried numerous keyboards that can be found stashed away around my apartment. One question I get asked all too often by stunned and horrified friends and family is: "You're getting another keyboard?" There are just so many

factors to consider and promises of typing perfection to be found just over the next financial hill. Perhaps, the key switches aren't quite perfect. Maybe, there are no multimedia keys allowing for easy switching of music tracks while working. Or else, there's no way to find out how charged the keyboard is without sighted assistance, since the battery status isn't reported to your iOS device. Sometimes, it can be hard to tell whether the keyboard is even on or off due to there not being a physical power switch. Blind people aren't typically in mind when these keyboards are designed. However, there are usually ways to cope barring abject imperfections like the sad case of the Hexgears X1 keyboard I briefly mentioned earlier. There comes a point where you simply need to take the plunge and hope for the best. However, there are ways to go about this pursuit that can minimize the chance of utter defeat.

Step 1: Think about what your ideal keyboard would be like. Have a firm grasp on what you're after. You won't likely get exactly what you want, but it gives you a starting point. My ideal keyboard would be rigid enough to use on my lap when necessary. It wouldn't be too compact and would stick as closely as possible to a QWERTY08 design. Good tactile key travel and multimedia function buttons were important. I didn't want situations where I accidentally invoked a function like muting

sound that was controlled by a flat pad I couldn't quickly distinguish by touch.

Step 2: Pick one or two characteristics and start looking for keyboards that have them. Alternatively, think of what kind of person might want a keyboard like your ideal one. For me, that was authors. It had to be comfortable to do serious lengthy writing on. That comfort clearly trumped smaller size. It also had to be rugged so it would withstand bumping against things. Sadly, that's just part and parcel of a blind man's lot in life. All the more so when said blind man requires hearing aids. If I go through the trouble of getting used to a keyboard, it had better last a long time. This thought exercise gives you plenty of good ideas for words to include in online searches. Google is very good at dishing out meaningful results from a few well-chosen keywords or phrases separated by commas. For instance, "rugged, Bluetooth keyboard, writers".

Step 3: Go through reviews that your initial criteria pointed you to and narrow down the prospects by what you read about them. If a particular item seems especially promising, take the time to search on YouTube and your search engine of choice for more reviews specifically about that particular item. Think long-term satisfaction here. It's worth paying a little extra if you plan on living with your decisions for as long as

possible like I do most of the time. I would even go so far as waiting until I had the money to obtain a really critical part of your kit like a good comfortable keyboard. Hopefully, you'll do better than I have at measuring twice and cutting once.

Result: The first such keyboard I chose was a Microsoft Universal Mobile keyboard. I read reviews and descriptions of many different Bluetooth keyboards. However, the Microsoft one kept coming up as being the closest thing to what I wanted. Video reviews let me hear the sound of the keys in use and also described aspects like the power button on the side. It had a rigid magnetic cover that folded open like a book and could be removed to be used as a stand. It would also serve as a tray to put my iPhone on while typing with it on my lap. Reviewers praised its comfortable size of 85% of a full keyboard and good tactile feedback. Battery life was excellent, letting people go at least a week of average use without charging. Closing the cover turned the keyboard off automatically. It was still one of my more expensive investments, but I found it on sale and pounced.

When the keyboard arrived, it turned out to be somewhat shorter than I had envisioned. My spatial difficulties made themselves known as the keyboard proved to be too short for totally comfortable use on my lap. It was perfectly possible

with my knees close together but not as comfortable as I had hoped. The keys felt good, and it was nice and sturdy. It was somewhat cramped when compared to a full-sized keyboard, but I had expected that. The function buttons turned out to be an even more valuable addition while using AirPods. I've been very happy overall with this purchase especially while travelling. For increased comfort and efficiency, I later acquired a Grifiti lap desk designed for tablets and small keyboards. This let me set my iPhone in portrait mode beside the keyboard with both items being very stable and comfortable in my lap. A very nice combination that fits into a small shoulder bag along with other items.

For home use, I wanted something with higher-profile keys more akin to a computer keyboard but not a mushy membrane kind. The answer was to look for affordable Bluetooth mechanical keyboards. One lesson I had learned from the Hexgears board was that I preferred linear mechanical switches. There are many choices of switches typically named by colour. For instance, red switches are linear and travel smoothly up and down. On the other hand, brown switches have a tactile bump and create an audible click at the point where your keystroke is actually registered. I must say that it was a strange experience, having never actually seen colour, to have meaningful consequences and

differences attached to words that had been devoid of such real visceral meaning throughout my life. Skilled light-fingered typists using a keyboard with brown switches can lift their fingers once this bump is felt or the click is heard and not press the key all the way down. I'm a heavy-fingered typist, so my keystrokes always bottom out with a definitive noisy clack. There is a widely used solution to cut down on this noise. Basically, it involves you taking the time to remove each keycap from the board and put an O-Ring around the stalk of each key before putting the keycap back on the switch. This does help with reducing the clack of bottoming out but introduces some of that mushy feeling common to membrane keyboards back into the equation.

My second attempt at a good keyboard for home and travel resulted in what I'm typing this on now. It's from a company called Kemoove and is what is known as a 60% keyboard. It's a mechanical keyboard with red linear switches. Priced at around \$50 Canadian, it's one of my more affordable and successful keyboard gambles that I bought on Amazon. As usual, there are pluses and minuses. One of the reasons that it's so affordable is that there are only 63 keys on it. There's no number pad or function keys. There is a key called FN that allows for extra capabilities such as adjusting the lighting on the keyboard and

switching between connected devices. I had hoped this would allow me to use the number keys as multimedia control keys while holding the FN key down, but this didn't pan out. The keyboard is solidly built and has a physical on/off switch. Even better, it reports the battery charge level to my iPhone. Unfortunately, it's somewhat noisy to type on, so I don't use it while travelling as I had hoped to. Cramped though it is, the Microsoft Universal Mobile keyboard still serves me while out and about and does so quietly. This makes incurring the wrath of others nearby when I choose to type much less likely.

I have recently backed a keyboard from a company called Keychron as they're launching it on Kickstarter. This is their fourth keyboard, and previous ones have received a lot of extremely positive reviews. It is a 65% keyboard with two separate FN keys. One of these deals with keyboard functions such as lighting. Thankfully, I'll be able to turn that fully off, thereby greatly maximizing the battery charge. The second FN key will let me use the numbers as multimedia controls, which I keenly look forward to having on my keyboard again. While it won't report the battery charge to my iPhone, it does have a large 4,000 milliamp (mA) battery, as well as a physical on/off switch. I can live with this compromise. There is the danger of lag given its use of Bluetooth version 3. I opted for more

expensive optical red switches in hopes of minimizing this, presuming it's an issue at all. I discuss lag in the next subsection.

I would say that it's a good idea to have a backup keyboard around. Should something happen, you'll keenly feel the lack of a keyboard while using the touchscreen for typing. There's simply no comparison even with apps like FlickType or the new QuickPath typing method Apple has introduced. Physical keyboards are simply always going to offer better speed provided you're a skilled typist to begin with.

Sadly, accidents do happen to keyboards. I spilled water on my Microsoft keyboard while it was open, and I was certain it had been ruined. So certain, in fact, that I bought a cheaper Bluetooth keyboard, which sadly exhibited too much lag to be used very well. Thankfully, the Microsoft keyboard stopped turning my typing into gibberish after around a week of being left lying open to hopefully dry up the water. It seems to be in full working order, but I can't quite trust it as I once could.

I wish everyone the best of good fortune in your quest for a good keyboard. There's endless choice out there. Even mechanical Bluetooth keyboards are becoming quite affordable. There are some keyboards that connect via the Lightning port on your device and don't require batteries. I have yet to try one

of these. iPad owners can find cases that have keyboards built into them. This pretty much turns an iPad into a basic laptop. For people who struggle with touchscreen typing, having a physical keyboard can make a world of difference.

Beware the Lag

When it comes to keyboards, speakers, earbuds, and headsets, blind people have a major concern that supersedes all others. That is to minimize or completely avoid Bluetooth lag. Lag results from the time it takes data to be sent via Bluetooth between devices. Bluetooth uses radio waves to transmit data. Techniques are used to eliminate interference from other devices and check for any errors introduced in transmission and maintain connectivity between devices. A lot is happening behind the scenes to provide basic connectivity. Blind people require VoiceOver's responses to their actions to be as close to instant as possible. Even a split-second delay can be very frustrating and lessen your ability to competently control your device. If you're sighted, imagine having to wait a half second before the character you typed appeared on screen.

Lag matters more in some contexts than others. Sound delay doesn't matter as much for listening to music, podcasts or audiobooks. You're not interacting much with your device while this happens, and the sound can simply play. However, lag

becomes bothersome and even a serious concern when you rely exclusively on sound to actually control your device. Enough lag might result in you thinking that you're on one control while you're actually on another. Instead of pausing your book, you might skip back a whole chapter. You could accidentally hang up an important conference call rather than muting your microphone while attending to something private. It's vital that VoiceOver reports the current status or the result of a gesture as soon after it is made as possible.

To avoid lag, look for a high Bluetooth version number. Don't get anything using Bluetooth 4. Bluetooth 4.1 is as low as you should be willing to go with the exception of keyboards. Higher is better. Bluetooth 5 is ready, and products that use it have entered the market. This will give better speed, and more reliable connectivity and range. Bluetooth 5 should make dealing with lag a thing of the past. Apple uses its W1 chip to enhance Bluetooth connectivity solving many problems.

Audio Accessories

My second generation AirPods have almost no lag, are dirt simple to pair, and have good battery life. At the time of this writing in early 2020, Apple has released a second generation of AirPods that are Bluetooth 5 capable and use a greatly improved H1 chip. Reports are very favourable, indicating absolutely no

lag and increased talk time. Having acquired a pair of these, I can testify to this. For me, lack of volume and other control on the AirPods was a small price to pay for completely wireless operation and extreme portability. I don't mind using my iPhone to perform these functions. Also, when I'm using my Microsoft Bluetooth keyboard, it has those volume and playback functions built in. AirPods work wonderfully for me along with my hearing aids and combine unexpectedly good sound with extreme portability. However, I wouldn't use AirPods while walking outdoors. They are tiny, and it would be too easy to lose them if they ever fell out of your ears. Also, earbuds block too much of your ability to hear your surroundings. Concern is growing even for sighted people about this constant quest for sound isolation. For blind people, it's vital to hear what's happening around us.

These concerns led me to seek a good outdoor alternative. Aftershokz offers wired and Bluetooth bone conduction headsets. Basically, transducers positioned in front of your ears send sound through your bones leaving ears free to hear what's around you. These have tactile controls, voice guidance, and don't block your ears leaving them free to hear your surroundings. They also are very unlikely to fall off. You lose some sound quality compared to other headsets or AirPods, but it's worth

the trade when outdoors or while your ears are wet after swimming or taking a shower.

The shopping procedure is the same for audio accessories as with the keyboard. Think about what you want and then look for options that give you as much of what you're after as possible. Think long-term. Many accessories can get updated firmware. This allows manufacturers to make improvements after products are in the field. AirPods can receive such updates so that Apple can improve them, taking customer feedback into consideration. I expected my AirPods to last years and made my choice with long-term satisfaction in mind. After a little over three years, my original AirPods were showing their age with decreased battery life and connection dropouts. Overall, though, they were a very good investment, and I had no hesitation about getting a second-generation pair. Apple has now released AirPods Pro that offer noise cancellation and a mode letting you hear your surroundings despite having buds that seal your ear canals. These are quite a bit more expensive than regular AirPods, and I also hesitated with these due to my hearing aids that need to be inside my ear canal.

Be mindful of power required by these accessories. Apple AirPods last around five hours but have a charging case that contains enough for multiple charges. I likely won't have to use

an external battery to recharge them between opportunities to plug in most of the time. You can use and charge them separately, charging one while using the other. That won't be an option with headsets. While they're charging up, you're out of action unless you have a backup plan like using Lightning EarPods that come with iOS devices or a spare Bluetooth headset or earbuds.

I got curious one morning and decided to chase down the actual mA capacity of my original AirPods. Thanks to a site called www.ifixit.com. I found my answers. These people take products apart to see how easy they are for people to repair. In that process, they find out some nifty stuff. In their teardown of Apple AirPods, they determined that the tiny batteries in each AirPod hold a charge of 93 mA. The case holds a charge of 398 mA. Theoretically, you could fully charge both AirPods at least twice. Presuming you fully charge everything before starting your day, that gives you the initial five hours plus enough charge for ten hours of both AirPods plus some extra charge.

Sometimes, you can find devices with nice extra features. For instance, there are Bluetooth speakers with built-in FM radio capability. The USB charging cable that comes with these devices often serves as an antenna allowing for good FM

reception, in addition to providing a method for recharging the batteries. Read reviews carefully to help determine how easy to operate and how tactile the controls on devices are. If devices use touchscreen controls or buttons that are hard to feel, you may not be able to use them. Also, there are companies who are more aware of accessibility issues. Aftershokz are a good example, as they equip their headsets with voice prompts and have tactile controls.

The Fugoo line of Bluetooth speakers come equipped with built-in voice guidance. A radio announcer voice can inform you of the battery level, connection status, and which mode the speaker is operating in. For instance, there is a loud volume mode for outdoor use and a power saving mode. The controls are all tactile buttons located on the top and at the ends under the top edges of the speaker jacket. The sound is quite good, and there is very little lag. Other speakers may also feature built-in digital assistants such as Alexa that are voice operated.

Extra Power

Blind people can put heavy demands on the batteries in iOS devices. Setting the Screen Brightness to 0% helps conserve power, so blind people should do this. You can always increase the screen brightness when you require sighted assistance with your device. The VoiceOver Screen Curtain feature doesn't

actually turn off the screen. It merely obscures the contents. Setting Screen Brightness to 0% saves a nice bit of power. However, GPS, Bluetooth, cellular and WiFi connectivity, and constantly producing audio drains power. You can turn off things like WiFi if you're not using it. Airplane mode shuts down all transmission of any kind from your iOS device and is helpful when you want to recharge your device rapidly. However, if you turn off Bluetooth, AirPods and other Bluetooth audio accessories won't work. You'll likely need Bluetooth on all the time. The more connectivity you turn off, the less potentially useful your iOS device is. You can't receive a phone call or text message while in Airplane mode unless you specifically turn on the needed capabilities. The same goes for handy apps like Seeing AI that need Internet connectivity. These devices are so helpful that we want them to be ready whenever we need them. Extra portable power doesn't cost a fortune and just makes sense.

Apple sells cases that contain additional battery power for their products. For people likely to forget extra gear like external batteries, this can be a very good idea. They offer an additional advantage of communicating their level of charge to your iOS device so you can know how much you have remaining. However, cases built for your current iOS device might not be

useable on future ones. Changes in size and the position of ports can easily render a case useless once you trade in your old iPhone for a nice new one. Presuming you'll be using an iOS device for two or more years, battery cases designed specifically for your device can absolutely prove a worthwhile investment.

Going with external batteries, you will almost certainly be able to use them on future iOS devices for as long as the batteries can keep recharging. All rechargeable batteries will eventually wear out. However, they are relatively inexpensive to replace when that's necessary. I have yet to hear of a talking external battery or one that communicates its charge level to your iOS device. Short of asking a sighted person with you or using an app like Be My Eyes, there's no way to know how much charge your external battery has. Therefore, you need to get into the habit of charging them up regularly. Get more power than you need so that if you forget to charge the battery or are away from power sources for longer than expected, you'll be ready to cope.

There is currently one accessible power bank that I'm a happy owner of. It's made by a company called Energrid and is designed specifically for blind people. With two USB ports and a capacity of 15,000 mA, it could charge an iPhone four or five

times with power to spare. It is available at www.atguys.com and is also for sale to Canadians at www.cnib.ca. Look in the CNIB online shop. Originally, I got my Energrid battery from an online store in the US and had to pay an import charge. Going through the CNIB store will eliminate that additional cost for Canadians. The battery costs around \$100 Canadian. Compared to other regular power banks, this is expensive. You can obtain power banks with a lot more capacity for far less than this price. These power banks will almost certainly be lighter and may be smaller in physical size. Dimensions of the Energrid battery are 14 centimetres long, 6.5 centimetres wide, and 2 centimetres thick. This is about 5½ inches long, 2¾ inches wide, and just a tad under an inch thick; 13/16 of an inch to be exact. It will fit into a pocket or quite easily into a purse or pack. However, people may find it a little heavy in the pocket. As far as I'm aware, it's the only truly accessible power bank in North America currently available.

I've found the charging speed quite good but not the fastest I've experienced. Clearly, safety has come first in the design of this power bank. The battery doesn't get very hot when charging or while giving power to devices even when charging two things at once. You could comfortably charge things with the battery in your pocket.

Though relatively expensive for a power bank of its capacity, you avoid the problems encountered with normal power banks. For one thing, since it was designed for blind people, there's no flashlight to get inadvertently activated, draining power for weeks as it shines uselessly. Ports have tactile dots that match up to sound and vibration cues. When you plug the battery in to charge, a single beep and vibration happens. This matches with the single dot above the port used for charging the battery. Two beeps and vibrations happen when you plug something into the USB ports on the battery to charge it. This matches with the two dots found near the two USB ports on the battery. You'll know for certain when you're charging things and when the battery is charging. You'll also be alerted when the battery is fully charged. It will emit a long continuous beep and vibration to let you know. This also happens if you plug in the charging cord and the battery is already fully charged. This will help to prevent overcharging the power bank

To find out how much charge is in the battery, press the button on the battery. It will give four short vibrations and beeps if it has from 100% to 75% power. Three vibrations and beeps indicate the battery has between 75% down to 50% power. Two vibrations/beeps indicate 50-25%, and one beep is 25% or less. Hold the button in and it switches from sounds and

vibrations to just vibrations. This is useful when you don't want to disturb others but need an idea how much power you have.

All of these features will help you take better care of the power bank itself as well as avoid any nasty surprises.

Recently, I took an ordinary power bank to an event only to find that it had no charge in it at all despite my thinking that I had left it properly plugged in the day before. With the Energrid accessible battery, I've never once been caught unawares with a dead battery. Also, I can always be certain that I've successfully plugged accessories in. While your iOS device will let you know via a sound when it is charging, other accessories don't tend to do this.

Another thing to remember is that most of these batteries can serve as relatively powerful flashlights. This usually involves pressing a button located on the battery. A handy feature for sighted people, but a liability for blind people who can't tell when they've accidentally activated the flashlight. One way for blind people to deal with this independently is to have a light detector app and use your iOS device's camera, moving it near where the flashlight in the battery is. This is usually on the top near the power ports. The Seeing AI app from Microsoft is free and includes this capability. Select the Light

Detector channel. A higher-pitched tone indicates an increased level of light.

Batteries have a capacity measured in mA. An iPhone 7 has an internal battery that holds roughly 2,000 mA when fully charged. An iPhone 10 holds 2,900 mA. An iPad Air 2 holds around 8,000 mA. An iPad Pro has a 10,300 mA battery. The general premise is that these batteries should last a day of typical use. In practice, this pretty much never happens. Talk of people running out of charge during their day is constant. Accessories are also prone to this need for additional power. My Aftershokz Trekz Titanium headset has around 830 mA and lasts around six hours of continuous use. Were I to use that for a full day, I'd have to recharge the headset at least once. The iPhone would need at least a full charge and possibly more presuming heavy constant use. If you're using it as a laptop replacement, reading audiobooks, navigating with GPS, and actually (gasp) talking on the phone, that qualifies as heavy use. You would easily burn through around 2,500 to 3,000 mA or thereabouts over a long busy day.

The tradeoff is normally power available versus weight and size of a given external battery. You can get batteries holding around 27,000 mA that weigh perhaps as much as a couple of pounds and easily fit in a purse or bag. However, they're too

large to fit easily into a pocket. At the other end of the spectrum, you can get batteries the size of credit cards that offer around 2,000 mA of charge. Most of the time, you'll have opportunities to charge daily. Given that, I recommend a 10,000 mA capacity battery. These should easily fit in a pocket along with your iPhone and AirPods. Anker makes good reliable light and portable batteries. You'll find a lot of competing companies in this space, so look around for what suits you. They also produce other charging equipment like durable Apple-certified Lightning cables. Most external batteries don't automatically come with a Lightning cable included, so keep that in mind. Use the one that came with your device, plugging the USB end into the battery and the Lightning end into your device. Spare cables are quite inexpensive. I recommend you obtain one to be kept with your external battery at all times.

Going farther off the grid, there are accessories that allow you to charge your batteries via solar energy or via pedal or crank power. These accessories often combine several features suitable for emergencies. Eton is a company who makes well-known, respected emergency gear like radios which offer USB crank charging capability.

Cases

It's generally a good idea to get a case to protect your iOS device. You will eventually drop it, knock it off a desk, or worse. Considering how much you'll come to rely on your device, investing in a case is a no-brainer. Picking the right one requires some care. Shape matters. The battery case for iPhones has a hump on the bottom where the battery is. The extra power is certainly handy; however, the hump protruding from the bottom might slightly destabilize the phone when it's on a flat surface. Some cases are thicker than others. There are cases designed to be extra rugged for adventure travel. Others offer built-in, collapsible Bluetooth keyboards. Many offer extra battery capacity. Some offer extra data storage operating like flash drives for computers.

Keep in mind that unlike other accessories, cases are likely not going to be useable when you eventually upgrade to a new iOS device. The thickness, port positions, and size and shape of iPhones and iPads have changed enough to render many cases totally useless on more current iOS devices. That makes me stick with rugged simplicity. I use cases for protection only and find other external accessories that I can continue to use after upgrading. Originally, I chose an Otterbox Defender case. It's thin and flat and offers reasonable protection. However, in

recent years, I've instead chosen to go with Life proof cases. These are cases which are waterproof, drop-proof, dust-proof, and shock-proof. They are more expensive than Otterbox cases but offer even better protection. However, they had a reputation for muffling the sound coming from the speakers of your device. Personally, I haven't found this to be a major problem, although it is certainly noticeable. This might be an issue for some people when not using headsets or other audio accessories. Some cases have slots for Lightning cables that are less forgiving of cable ends with thicker material surrounding the Lightning end of the cable, which might prevent you from using some Lightning-connected accessories or docks without first removing your iOS device from its case. Most good cases these days have built-in screen protectors. If the case you're looking at doesn't have that, don't even consider it. Sticking on screen protectors is annoying and utterly unnecessary given the affordable protective cases available.

Conclusion

There are plenty of choices in your approach to accessorizing your iOS device. For starters, though, don't forget the basics. You should obtain a spare Lightning cable and power brick from Apple so you're never without the ability to charge your device. A spare set of EarPods is also a good idea.

These are very inexpensive items and are widely available. You can put together a travel bag that is slung over a shoulder and weighs far less than ten pounds. This weight could even include an external battery that could keep your system fully charged for a week's activity. This kind of easy portability and reliability is incredibly liberating. Particularly since most of the actual core capability can fit in a pocket presuming you use an iPhone or iPod as your computing power. iPads are larger but are very light and thin devices. Their larger screen size can be tremendously helpful to people with useable vision.

Going beyond these basics, have a clear idea of what capabilities you want. If you're planning on doing a lot of adventure travel, you may want to look into ways of keeping your devices powered while off the grid. There are external batteries capable of hand-crank or solar recharging. If you attend parties, you may want a Bluetooth speaker capable of allowing multiple users to easily pair and play songs. Such speakers absolutely exist. Most Braille displays can pair with your iOS device over Bluetooth and work with VoiceOver. Should you live with other disabilities, there are all sorts of switch controls and other accessories that may be helpful. There are even game controllers for hardcore players. New and better accessories appear all the time.

Manufacturers of accessories are quick to advertise if they work with iOS devices. As long as you take the time to read descriptions carefully, you won't end up with something that is completely incompatible. For blind people, it's very important to pay attention to details of interface. How easy is it to operate a given accessory strictly by touch and hearing? That's where it can really pay off to check out reviews from people who have used the devices you're considering. A good place to start is www.applevis.com. They have a growing number of accessory reviews in addition to their extensive information about apps. Often, there are even podcasts available where people discuss various accessories. In addition to AppleVis, check out www.blindbargains.com and www.coolblindtech.com.

The Apple Ecosystem: What You're Getting Into

When I got my first iPhone, I thought of it as a kind of separate device that was more capable than an ordinary phone but still basically a phone. It started out with some included functions. I could find out what the weather was like, call, text and email contacts, record voice memos, and use the built-in calendar for example. All of this worked very well with VoiceOver. This was fabulous! Just the idea of being able to buy a mainstream device you heard about on radio and TV shows and have it work out of the box for blind people was intensely thrilling to me. Even more thrilling was the prospect of being able to purchase and download many apps that everyone else used and have them all just work. I had simply never been in a situation before where economics of scale could work so powerfully for me rather than against me. Prior to this, I had actually spent less money for the computer than I spent on the screen reader that let my computer say what happened on the screen. And then, one day in 2011, I walked out of the same store as the sighted people I passed on the street having paid the same as they did for a device I could use just as well as they could.

That was the myth that prevailed in the exuberant and eager blind online community I found myself to be a new part of. I knew this wasn't strictly true. There were tens of thousands of apps that were completely inaccessible to blind people, and always would be, since they were just too visual in nature. They didn't employ the accessibility tools Apple had created. It was more like being invited into a playground where you could make use of a smaller selection of really fun installations. For a while, you're so captivated by the swings and slides available to you that you don't care that you can't do everything.

Unlike so many other slices of life where disability can prevent people from inclusion, you're at least in the same playground as everyone else. Due to accessibility tools built into the design, you can often use the same equipment and know enough to be able to help fully sighted newcomers get to know the ins and outs of the place. What's more, Apple, the owner of this playground, did all it could short of force to encourage developers to make their installations as accessible as possible. That's the very important truth behind the myth. If enough stuff is useable, it's still absolutely worth going to the playground. You'll still have a good time. It simply might be a different kind of good time than others are able to have. You might have to be more creative and adaptive, but you take an

important step that can really help when it comes to relating to others who use the same thing. That can really help break the ice when someone notices you're using an iPhone doing something that they themselves have done or might want to do.

All the apps that came with the phone initially were made fully accessible by Apple. Also, Apple had designed its accessibility tools to be useable by developers who wished to make their apps accessible. Provided developers used standard interface elements, many apps would therefore be fully accessible even if developers had made no efforts in that direction.

Slowly, as I got more apps, music, games, and books, it became easier to understand the overblown enthusiastic joy radiating from the blind people who, braver than I had been, got into the iPhone earlier. I also slowly began to appreciate the far-reaching effects of the choice I had made that fateful day when I chose to get an iPhone. The following section discusses The Larger Picture, which is the full Apple ecosystem. As the owner of an iPhone, iPad or iPod, you are now operating within this larger economic setting. I'll explain to you what being a part of this ecosystem will mean to you as a user and consumer. If you're more interested in how to use the app store, Apple Books, iTunes etc., feel free to skip to the appropriate section

of the guide. This section is for people who want to understand the large-scale implications of choosing an Apple device rather than one based on Android or other ecosystems like Microsoft or Linux. I'll tell you the reasons why I've chosen to use Apple products, and why I'll stick with them barring some catastrophic change in circumstances. My main reason is still the excellent work they've done making their products accessible. It was an easy choice at the time I made it. Pretty much a no-brainer. These days, Android is catching up in this area. It's nowhere near as clear cut in terms of accessibility as it used to be. Hopefully, I can help people make a somewhat more informed decision at least on the Apple side of the equation.

The Larger Picture

Apple didn't start out making iOS devices. The company's history extends back to the beginning of home computing in the 1970s and '80s. For a time early in my school years, I owned an Apple IIe that I did a lot of my schoolwork on. These days, Apple has branched out in a number of interrelated directions. It now makes computers as well as watches, TVs, and many other devices. They now also produce shows, sell books, and offer a number of services. All of these are designed to complement each other as much as possible. Ideally, Apple hopes that you'll choose to use their products and services rather than the

competition. Decisions made by Apple are made in that much larger overall context.

When you decide to purchase a smartphone or tablet, that choice has broader applications than are immediately apparent. You are deciding to invest in a carefully constructed ecosystem. I discussed this briefly earlier. Now, we will delve more deeply into the ramifications of Apple's ecosystem of interconnected software, hardware, and digital goods and services. I hope this enables people to go in with a better understanding of the tremendous economic forces at play shaping what you experience as owner of an iOS device. There's a prayer by Reinhold Niebuhr that says: "God grant me the serenity to accept what I cannot change, the courage to change what I can, and the wisdom to know the difference." Such qualities will serve you well as you learn to appreciate the advantages and deal with the disadvantages of the world that Apple has built and gone to great lengths to invite blind people into.

First of all, lets spend some time looking at the overall philosophies behind Apple's iOS ecosystem. One of its main premises is that to provide the best possible customer experience requires proprietary control over and integration of hardware and software. Apple built the iOS operating system to exclusively run products that they themselves created. That

sounds more complicated and technical than it actually is. Basically, no third parties can do anything to either the hardware such as iPhones and iPads, nor can they alter the iOS operating system without permission from Apple. Any developers of apps or other companies must play by Apple's rules and with Apple's approval. They are gatekeepers and guardians of their walled garden and strongly believe that this guardianship benefits their customers. This philosophical stance has some pretty profound implications.

Understand that not all of these implications are purely there to benefit the consumer. Never forget that Apple is a business and seeks to make a profit at every possible turn. Some decisions Apple makes actually limit what is possible to accomplish on their devices to garner more businesses. For example, Apple makes it impossible or harder for people to copy music or books they purchased to sell or give to friends. This decision made it possible for book publishers to make money along with Apple by offering content through their own apps or Apple's. It also decided not to allow the sale of pornographic apps or other content on its platform. These sorts of restrictions turn away people who wish to partake in such things but garner increased trust and support from parents who feel safer giving their children iPads and iPhones rather than

similar often much cheaper equipment from other companies. The same holds true for all of Apple's extensive and laudable efforts in being environmentally responsible. Good will and trust equal more sales and more overall satisfaction.

For Apple, security and safety for both users and businesses who participate in its ecosystem has always been highly important. Apple can protect its users from malicious software far better than has yet been achieved on more open platforms like Android. It can enforce rules making certain that apps with adult content respect parental controls built into the operating system. This has resulted in parents feeling safe giving these products to very young children. Educators have also gravitated to using iPads in the classroom due to Apple's choices when it comes to security. Google has made strong inroads into this space mainly through price of equipment as opposed to other factors.

Keeping things simple is another core philosophy for Apple. You will find that the options presented in Settings and other areas are kept quite easy to understand. A complaint that is often levelled against Apple by proponents of the Android operating system, the most notable competitor to iOS, is that users are prevented from doing things simply because Apple has decided not to provide the option. In other words, the hardware

in an Apple device might be able to adjust its broadcasting frequency or power level, but there's no option presented to users letting them do so. An example of this is that users of Android phones have been able to change elements of how their phones look to more precisely suit their wishes. They can also exert more control over the hardware in their phones such as the radios enabling Bluetooth and WiFi capabilities. In the interests of safety and keeping things simple for less-technically minded users, Apple has kept such options far more limited in scope.

For a lot of people, myself included, this is a far more positive thing than not. I appreciate that Apple is guarding the gate and have yet to be hindered from doing anything I've actually wanted to do with my iPhone. However, for some people, having any possible action denied them for any reason is fundamentally disturbing and unacceptable. That's something you'll have to decide for yourself. If you can't find happiness within Apple's ecosystem, there are other options available. Although I still think Apple offers a superior experience, especially in terms of accessibility, those other options are now far better than they once were. Apple must actually work to stay ahead these days.

When it comes to developing apps and testing them for accessibility, Apple has dominated and is only now beginning to truly be chased by Android. Apple's product range is relatively small when compared to the myriad number of different systems that a version of Android might find itself running on. Therefore, developers can know for certain what hardware their apps might be running on within a very limited and well-defined range of possibilities. This makes testing and quality control a much easier and less expensive process. Also, the cost of features like VoiceOver and other accessibility tools are spread out and carried by everyone who purchases an Apple product. The days of paying nearly as much to make your smartphone tell you what's on the screen as you paid for the actual phone are a thing of the past, thanks largely to Apple. Rather than have other companies develop apps like screen readers, Apple takes on the work itself, fully integrating these features into the operating system. As long as your device supports the latest version of iOS, you need not worry that its screen-reading capabilities will suddenly be out of date. It's that simple. The same holds true for all of the many accessibility features that come built into iOS. Also, it's easier for developers to make certain that apps will be accessible. There's only one screen reader to worry about. Just like anybody else, developers can

use accessibility features themselves at no cost to make certain things work as they expect. A central interface for accessibility means that work done to help users with one disability can also help others.

One less than positive implication of having accessibility tools made by the same company that does everything else is that issues might not be addressed as speedily as one would like them to be. Blind people comprise a very small fraction of Apple's overall customer base. There are all sorts of pressures to release major operating system updates as soon as possible. It takes something truly show-stopping that would affect practically every iOS user to delay a major iOS release. Even by that standard, we've seen some truly hideous bugs get through every so often; bugs that you'd have thought were serious enough to warrant a delay until they were dealt with. Examples include a major iOS update that prevented iPhones from actually answering and making calls. Another release caused serious battery drain issues. Apple really scrambled to release a fix for that "no phone call" problem in a heaping hurry, having a patch ready within a couple of days. The battery drain took a lot longer to figure out. Still another release turned new expensive state-of-the-art iPads into nothing more than inert flat slabs of tech needing to be taken to an Apple store to be

reanimated. Issues like that can shake people's confidence badly. Apple tries very hard to avoid such things and really has to scramble when they fail to do so.

And yet, it's still somehow clearly better from an overall business perspective to have new iPhones and operating system versions released before such issues are resolved. Otherwise, by this stage in the maturity of tablets and smartphones, we would no longer be prone to experiencing these sharp regressions in functionality.

Compounding the problem, No official warnings of such difficulties are ever issued prior to a release. People who test versions of iOS are under strict non-disclosure agreements and shouldn't report on any such problems prior to release without Apple's permission. They could get into legal trouble. This helps Apple control when their competitors learn about what they're doing, which is very important in maintaining their place in the increasingly competitive market they helped to create. This need for secrecy has also resulted in some nasty surprises for customers every so often.

Nobody actually wants these bumps in the road for their consumers. Least of all, Apple. However, business pressures to get products out and have newly developed features in the market often clearly trumps the need for more careful testing and

quality control with the software that makes everything work. It seems hard to believe that Apple was completely unaware of at least the potential for widespread trouble in the above cases. It can seem absolutely ludicrous thirteen generations of software into the iOS journey. Even more so if people don't understand how mind-bogglingly complex the device they hold in their hands actually is. The software that makes your experience feel so simple is anything but. Many different departments of very skilled people work on different aspects of the software that is iOS. Each team has a good grasp of their area of expertise but might not understand how a decision they made affects everything else. In fact, there may not be anyone alive who fully understands how it all works. Sadly, this can result in decisions that perhaps were made at the last minute after testing was complete going into the ultimate public release and causing trouble. Even worse, issues that are known about may simply be ignored until a future update cycle has time to address them. Things that wreck your day may not bother enough others to warrant speedy resolution.

I took the time to give these examples because there are those in the blind community who have a tendency to feel that they're not much more than an afterthought. This really isn't the case at Apple. Time after time, there has been panic that

Apple was making changes that would leave blind people out. In every case, this has proved to be utterly misplaced fear. At Apple, accessibility is one of many very important but sometimes competing objectives. All of them are taken quite seriously. Apple does a great deal to promote inclusion and accessibility. Much of this happens at events like their WWDC. This is a Worldwide Developer Conference for people who make the apps everyone uses. At these events, they award developers who have made their apps accessible. There are videos produced to promote including people with disabilities and making apps accessible right from the start. New accessibility tools and features are demonstrated and taught so developers can make use of them. Sessions about various accessibility matters are in the schedule. Guest speakers have included the famous blind singer Stevie Wonder, and Haben Girma, a deaf-blind lawyer who graduated from Harvard. These people make use of apps in everyday working life.

I'll never forget one year when they included a video at the start of a product launch event that was all about the importance of accessibility. It had a blind photographer being told how many faces were in the family picture he was attempting to take. It had a man using hearing aids connected to his iPhone to hear the leader of a hiking group he was a part of. At the

end of the video, the audience learns that it has been edited by a lady overcoming her paralysis using her head to control film editing software as well as things like the shutters on her house windows.

None of these talented people feel like Apple is just a whim away from cutting them out of their equation. Apple has earned their trust. For all its faults and missteps, I submit that Apple has earned a level of patience and faith from those of us in the blind community that they don't always receive. They might very well make decisions less favourable to our specific ideal use. At the moment in early 2020, I'm contending with the ongoing annoyance of having the "misspelled words" rotor action being broken. This function used to work positively brilliantly! Having it not fully workable until Apple decides to fix it makes spellchecking my 250,000 word guide a good deal harder and more frustrating than it ought to be. I must confess to being somewhat peeved about this. Furthermore, I'll be even more annoyed should the next update to iOS, (13.4,) fail to fix this, especially since I took the time to report the problem to Apple Accessibility. Update: I am! They didn't fix it! However, I know that sometime soon they will address my issue along with many others awaiting action. I know they aren't going to simply leave us hanging and abandon all work on accessibility. That

being said, it does seem like disabled people are somewhat more vulnerable to significant lapses in capability especially when a major new version of iOS is released.

Preserving a degree of secrecy about what they're developing so that others don't beat them to the punch is one of the things in Apple's big picture that can prove troublesome. When Apple announced the iPhone X, it made a big deal of the new face-recognition technology and the removal of the Home button with its Touch ID sensor. Many blind people wondered how it would be possible to cope with these changes and presumed wrongly that Apple simply didn't care that it was ditching disabled people who couldn't look properly at a camera. Once again, these concerns quickly proved unfounded. Apple had made certain that gestures replaced the functionality of the Home button and that guidance was given via VoiceOver when blind people set up and used face ID. Everything was still possible to accomplish without sight. The methods had simply changed to accommodate new technology. Unfortunately, Apple didn't make that publicly clear right away. This secrecy allowed these fears to grow largely unchallenged except by people who had faith in Apple but initially had no actual information to counter the concerns of doubters.

Unfortunately, the bit of truth behind these recurring fears of being abandoned as a market is that even serious accessibility problems simply aren't ever going to trump market pressures to release on schedule or to include some shiny new feature that isn't yet fully accessible. This can have some very serious and even potentially dangerous consequences especially for new users who aren't well prepared to handle complications. A drastic example of this kind of pitfall happened with the release of iOS 11. It featured a lot of enhancements to how Braille was handled. However, these changes were rendered useless for people who relied on their Braille display keyboards for input. If all you did was read on a Braille display, that worked quite well. However, you couldn't type at more than a very slow speed or you'd find that whole words were simply lost and not entered into the system. Something had gone wrong with how input from Braille displays was processed by iOS. This was very bad news if you were deaf-blind and relied on a Braille display to do everything on your iOS device. You were also in deep trouble if you used a Braille display or iPad in the classroom or to take notes in a meeting. In those situations, it's pretty important to be able to type rapidly. There was a lot of bitter anger about this in the blind community, and questions were raised as to how dedicated Apple really was to

accessibility if they let idiocy like this happen. The only solution for those effected was to downgrade back to the previous iOS and wait until the issue was resolved.

The Apple accessibility department isn't known for raising any alarms prior to a major iOS release. Unless somebody breaks ranks and raises the alarm, people can get caught by surprise. Many people therefore choose to wait and see how others do before updating to the latest iOS version themselves. I highly recommend this practice to beginners. The AppleVis website has been given special permission to post information a little before the release of a new iOS version so that people can find out if there are known bugs that would adversely affect them. As far as I'm aware, nobody else has been given such dispensation.

On a Windows computer with a third-party screen reader, you would at least have gotten warned well in advance that there was trouble and that you shouldn't upgrade yet. The release of Windows 10 is a case in point here. Screen reader companies got the word out very quickly that users might want to wait and not upgrade right away. Also, Microsoft extended their offer of a free upgrade to Windows 10 by over a year to accommodate users who relied on screen readers that simply weren't ready in time. Meanwhile, users of iOS were reminded constantly to get the latest iOS version despite the difficulty they'd face if they

did so. What's more, after a short while, it became impossible to downgrade to the prior operating system to avoid problems introduced and not known about until it was too late.

News spread quickly as people found out the hard way about issues with Braille. However, it was too little too late to allow people to forego updating to what should by all rights have been a better experience. Mistakes like that do cost Apple in terms of bad publicity. It took around three months and two or three further small iOS updates before the problems with Braille displays were largely fixed, and people really started enjoying all of the other tremendous improvements to the Braille iOS experience.

Meanwhile, Smaller updates were pushed out rapidly to deal with security and other issues that effected a larger portion of Apple's user base. Each time one of these appeared, you'd wonder whether the Braille display issue would be fixed and discover that yet again, it hadn't. This can be very frustrating, and it's tough even for me to keep from losing my generally patient and largely grateful outlook.

Not being a frequent Braille user, the display problem discussed above didn't affect me in the slightest. Had I been a deaf-blind user who relied on his Braille display working reliably to communicate with others, it would have been a

showstopper. The more special your case is, the more vulnerable you'll be to this kind of thing. For me, this didn't represent a big concern other than to warn people about the problem quickly. I type far faster on a standard QWERTY Bluetooth keyboard than I ever could in Braille. My display was only ever used for reading. I had to go out of my way just to experience the problem firsthand. However, I cringed at the thought of being a student who had to contend with his or her Braille display becoming suddenly impractical in the classroom for pretty much a whole term of school. These drastic situations are infrequent but can happen from time to time. In such cases, there may be workarounds. For example, ordinary Bluetooth keyboards worked just fine. Presuming they could type, students could have obtained a cheap keyboard and used it along with their display. Not ideal but doable. Similarly, people affected by this more recent voice call bug could obtain a cheaper dumb phone for making actual phone calls presuming it was workable by blind people. They could then still use their iPhones for other activities until the bug was resolved. Not at all what one should have to do when you've invested in a premium product like an iPhone. Blind people pay just as much as sighted customers. Frankly, they shouldn't have to worry about really drastic bugs

like these appearing in what ought to be a well polished and tested iOS update.

Another example of this kind of thing was when Apple decided to remove the headphone jack from their latest devices and use the recovered internal space for other purposes including making their products thinner and more water resistant. This was a very controversial decision even outside the blind community. People would have to get Bluetooth headsets or earbuds or use Apple's proprietary EarPods that then took up the Lightning port on their iOS devices. This Lightning port was the only means by which they could charge their devices, so they'd have to juggle the need to keep their batteries charged with the desire to listen privately to anything while they were doing so. With the introduction of wireless charging, this has become a good deal less annoying to the general public, since the Lightning port is no longer necessary for charging. However, this change was even more of a blow to blind people who required hearing aids. Transmitting audio to a streaming device and then on to the hearing aid via Bluetooth introduced a significant latency that was quite annoying when you relied on VoiceOver to tell you what was happening on the device. You might make a gesture and then not hear the result of it for a quarter of a second or longer. I had an older but great-sounding Logitech

Bluetooth speaker that had this problem. When listening to music or reading a book, there was no issue. However, if you tried to answer a call or type something, that delay might throw off your perception of where the cursor was on the screen enough so you'd hang up on your caller rather than receive it as you intended. For anything other than passive listening, such a delay rendered VoiceOver itself pretty impractical. For sighted people who might find this hard to understand, imagine you're driving down the road in a car. This car responds instantly to what you do, but your perceptions of this are delayed by half a second. You turn to avoid an oncoming car but have no sense that you have in fact begun to turn until half a second after you spin the steering wheel. How safe would you feel in a car like that? How fast would you be willing to go?

Eventually, issues of latency will disappear as Bluetooth technology improves. I'm writing this while wearing AirPods, which are essentially Bluetooth earbuds. While there is still a minuscule amount of latency, I only become aware of it if I switch to using my pair of Lightning-powered wired EarPods or just use the iPhone's speaker. Things seem a smidgeon more snappy at that point. Otherwise, it's such a tiny latency that I'm simply not even conscious of it. I use hearing aids but don't require the audio from my iPhone to go directly to them

via a streamer. I can put EarPods or AirPods in and have them fit along with the tiny buds of my hearing aids. The batteries don't last as long, since I need to have the volume higher than people with average hearing would. Alternatively, I can use bone conduction headsets. If people require bone conduction hearing aids or use a kind that fully blocks their ear canal, they won't be able to do what I've been doing. Instead, they'll have to use an adapter Apple sells that lets you use a 3.5 millimetre (mm) earphone cord that can then connect directly to a streamer. These adapters are tiny, easily broken, and highly prone to getting lost. You'd be compelled to buy and keep spare ones around. I feel the same way about batteries for my hearing aids. You always want a ready supply of those handy.

Not needing these adapters, I was only a little perturbed at the thought of losing the headphone jack. It wasn't a major crisis for me. I eventually got the pair of AirPods I'm now using to hear music, nature sounds, and what I'm writing. While I love not having a wire to snag on things as I move around, it's not a perfect situation. I wish the battery life on the AirPods was longer, since I either need to charge them one at a time for brief periods while I'm working or simply switch to wired EarPods when the AirPods get too low. These days, I often hear such little grievances collectively referred to as "first

world problems" by younger smart-mouthed whippersnappers than yours truly happens to be. To use another of their expressions, "I believe I can deal just fine."

Once Apple makes a decision such as removing the headphone jack from its devices, people shouldn't hold out hope that such a decision will be reversed. Apple typically considers major changes pretty carefully. Reversals are perfectly possible, though. As I write this, it appears that the feature known as 3D Touch is on the way out due to it being too costly to build into the newer touchscreens of current and future iOS devices. A less costly tactile feedback system will take its place offering most of the same benefits. I don't make any use of the 3D Touch feature, so I certainly won't miss it. However, there are those who quite liked the shortcuts that it allowed developers to incorporate into their apps. They will miss it and much like those who miss the headphone jack, simply don't have enough economic pull to change Apple's mind. I actually think the folks wanting the jack to stay had a far greater chance and failed to affect the reprieve they hoped for. Just as apps may disappear, hardware features you quite like may also disappear. What's more, it'll be hard to simply walk away if that happens, since only Apple can make iOS devices. You're stuck with what they decide is economical going forward. With the Android ecosystem,

anybody can make a phone or tablet that incorporates a headphone jack or their equivalent of 3D Touch. You're not tied into one company's judgement on what's economical to produce.

Having control of everything helps you run a safe and tidy ship. That can help you and your passengers get more bang for your buck. However, it also means that Apple can charge more for its hardware, which is your ticket onboard. Barring unusual circumstances such as sales, you'll pay more for an Apple product than you will for an Android equivalent. Apple makes a good deal of its money selling hardware. Over time, it has begun making more money through its app store and other services that you need Apple products to use. Apple takes a cut from profits made by developers of apps in its app store. In exchange, it maintains the store that handles the transactional side of things, making it easy and safe for people to buy or increasingly subscribe to apps. Developers don't have to do more than maintain pages for apps in the already constructed, well-run store that uses artificial intelligence to hone in on what customers like, and then recommend apps to them. You can't get apps for your iOS device anywhere else. There's just the one app store. It's Apple's way or ... not even the highway. People can be confident that Apple staff have looked at any app they purchase and deemed it safe to use. It's not a foolproof system.

Criminals have made concerted efforts to sneak in malicious software and have had some very brief successes. However, there has yet to be any widely devastating breaches. I've felt much safer on my iPhone than I ever have on my Windows computer.

Another area where Apple flexes its muscle rather carefully is when it comes to using services that compete with those it provides. You are never stopped outright from using such services; however, it's just a bit less convenient to do so. Books have always been near and dear to my heart, so I'll use them to illustrate this key to Apple's success. To obtain a book on your iOS device using Apple's marketplace, the procedure is short and simple. Just open the Books app, find the book you want, double tap on the button with the book's price or the word "get" if the book is free, and then complete the payment process. Presuming you've set up your Apple ID, this is as easy as touching the Home button or looking at your device and clicking the Action button on the side of your device twice. People have often bought things they didn't intend to, because the process is so easy. After you've bought the book, you just go to the Library tab, or simply use the Read button that has just now surreptitiously replaced the Get button to enter and begin enjoying your new acquisition. It's all very frictionless.

To break free from Apple Books and enjoy Amazon's often far lower prices for the same books, there are things you'll need to master. You'll need to know how to use a web browser to sign up for your Amazon account, search for, and purchase books. It can take some effort to learn the Safari, Chrome or Firefox browser well enough to feel comfortable using it for shopping. Of course, you can also use any computer you're more familiar with to sign up, search for, and buy Kindle books. You can then just use the Kindle iOS app to actually download and read the books. Browsing the web on your iOS device is absolutely worth your time to learn how to do, but you'll first need to get somewhat comfortable with VoiceOver. Also, you'd better keep track of your Amazon credentials. Keep a file somewhere with any digital identification like passwords or usernames in case you forget them. There's one more thing you'll need to learn, and that's how to use the Kindle app. The Kindle app provides an absolutely wonderful reading experience. However, it is built quite differently than Apple Books in terms of its interface, so you'll need to learn your way around that. For veterans like me with years experience handling an iPhone, this wasn't very difficult. However, it's very different from Apple Books and the app store. Beginners might find mastering all these elements somewhat daunting at first. They could go through all that

trouble, or they could just stick to using Apple Books, having their audio and ebooks all available in one app.

Is it worth jumping through those extra hoops? That depends on what you want and how much of a reader you are. If you only occasionally buy books, it very well might not be worth your while. You might appreciate having your collection all in one very accessible app on your device. Now that Apple Books lets you purchase and listen to audiobooks, the convenience becomes yet more compelling. You could have your entire book collection in one app using the Apple ID and password for any purchases. It's even less painful when you can use Touch or Face ID and only rarely have to type in that password. Apple is banking on people being more willing to spend extra money to get what they want rather than extra time. If people choose to prove Apple is right in this thinking, I feel better if that choice is made from a position of awareness rather than having my readers discover years later that they would have done things differently had they only known.

This kind of situation is part and parcel of the iOS experience. You can always make use of competitive services. You can use Netflix for watching shows or movies rather than using Apple's TV Plus service. You can stream music with Amazon or Spotify rather than subscribing to Apple Music. All of this is

perfectly possible. Apple doesn't want its customers feeling really boxed in. They simply want there to be just a little more friction when you go outside Apple's well-manicured walled garden. Most of the time, you'll just need to purchase or subscribe to these third-party services on their own sites using their own apps and create personal accounts for whatever online stores you'll use that fall outside of services offered by Apple. If people are able to find what they want and get it easily, they won't feel the need to go through the effort of looking for alternatives. If they ultimately insist, better to let them enjoy what they bring back in style on their Apple device. The only point of mild friction is when you want to actually purchase from a third party offering a competitive alternative.

If Apple offers such convenience, why would you want to look elsewhere? Let me put it to you this way. I have under two hundred Apple Books after around eight years using my iPhone as my main device for reading books. This is despite having experienced my first taste of true literary liberty thanks to Apple Books. In contrast, I have well over twenty-five hundred Kindle books. Most of those books were bought while on sale for well under \$5. Without Amazon's economy of scale, I could never have assembled anywhere near that large a collection of books.

That's the kind of advantage blind people have simply been deprived of until now.

Apple does a lot of things well but can't do everything as well as companies who specialize in one area. When it comes to Amazon, that area is making books and other things available as cheaply as possible on a truly mind-blowing scale. For me, it's absolutely worth putting in the extra time to learn what's possible. Learning how to browse the Web or use different apps is something you get better at over time the more you do it. In the case of ebooks, it has quite literally paid off for me. In other areas such as music, I've been more than content to stay in Apple's walled garden. This satisfaction has only increased since I subscribed to the Apple Music service and no longer need to buy albums I'm interested in hearing.

When it comes to technology and a delightfully powerful but reasonably simple experience, Apple has consistently impressed me. I've never needed sighted help to set up an iPhone other than the very first time I did it in the store with the help of the salesman. The iOS operating system is a cost that Apple builds into the hardware price. You never have to pay for iOS or updates to it. Provided your hardware is current or even a few years old, you'll still be able to get the latest updates free of charge. Contrast this with Android where you might not be

able to run the latest version of the operating system until the manufacturer of your device produces a special version for your specific model. That could leave you stranded years behind the latest version of Android presuming they ever bother to do it.

In effect, when you pay a higher price for an Apple device, you're paying for curation, convenience, safety, high quality, and simplicity. That's really what Apple is trying to sell you. In exchange for those, you give up money and a degree of control. For instance, Apple pretty much forces you to take a device needing service such as battery replacement to their stores or send it in to have repairs made. This sort of thing is by no means unique to Apple, but they get called on the carpet about how hard it is for consumers to affect any repairs themselves. As with so many other things, after nearly a decade, Apple is slowly opening up to the possibility of third-party repairs that don't automatically void one's warranty.

We all pay for one or more things in an Apple device that we may have little or no use for. That was initially how I felt about the camera. Back when I got it, there weren't nearly so many apps designed specifically to put the camera on my iPhone to good use given my blindness. I could have, and sometimes did, use that camera and the FaceTime app to have someone sighted tell me what something was or read printed instructions. Other

than that, I had no other use for the camera until the advent of light detector, object identification, and print reading apps. That camera is now one of the most useful bits of my iPhone. Meanwhile, people with no disabilities are paying for maintenance of a screen reader and other accessibility tools that most of them will never need during the time they use a given device. Presuming they are even aware of that, they have decided that the Apple ecosystem is worth the higher cost of entry.

Similarly, people who choose to pay for an Android tablet or phone have decided that they can take care of themselves and don't value Apple's sense of what's right. In practice, this has given Apple the edge when it comes to accessibility, which Android is only now catching up to as I write this in 2020. By the time Android was anywhere near as blind-friendly, Apple had achieved massive penetration into the blind market. Due to this fast adoption and the tools built into the operating system, the number of accessible apps had grown very quickly. Unlike the AppleVis online community, there was no real central point for blind Android users to rally around. To the best of my knowledge, that's still the case today.

There are certainly things that might push me out of Apple's ecosystem. They could decide to start charging prices

for things that were simply entirely beyond my means. They could stop investing in accessibility improvements, thereby stranding people with disabilities. These decisions would certainly be possible for a large company to make. However, these aren't decisions Apple would make lightly and without warning. The public relations cost would be exceedingly high. People would very much care. Apple is extremely unlikely to abandon the middle-class consumer. Nor do I think the community of people with disabilities that Apple has invested heavily in courting onto its platform will be suddenly left out in the cold. Whenever Apple makes big changes, there's a current of fear that things will start to get worse. There are certainly bumps in the road, but anyone who would argue that Apple doesn't care about people with disabilities doesn't have a good grasp of the big picture.

App Store Economics: Money Behind the Magic

Apple maintains very tight control over what software is allowed to be installed on your device through its management of the app store. You can't obtain apps for your device anywhere else, so developers need to satisfy Apple's rules and policies to have a crack at satisfying you and me. For instance, apps that offer adult content must respect parental controls that Apple's operating systems make available to parents. App

developers are not allowed to do anything criminal or sneaky such as charge payments to their users without the knowledge and consent of customers. This is the area where we will most often feel the effects of decisions Apple makes in its efforts to maintain safety and maximize profits. How much we spend on apps and how well they are maintained over time are of tremendous importance.

Unfortunately, there are many people who don't take the time to understand how things look from a developer's point of view. There is a widespread myth that once you produce an app, you can then just sit back and rake in the money. This is patently false for many reasons. The most obvious of these reasons is that Apple charges developers simply to have their apps available in the store. If people don't purchase the app in sufficient numbers to offset this cost, the developer loses money unless the app is pulled from the store. Also, Apple takes a 30% cut from every sale of an app. As Apple improves its operating systems, apps must be maintained to accommodate such changes. This takes time, skill, and effort.

Even since I started working on this guide, the economics of developing apps has undergone substantial changes. For years, apps were sold at incredibly low prices. Many were available for less than a dollar. Competing apps would race each other to the

absolute minimum price in an effort to attract more sales. The days of extremely cheap and capable apps have proved to be unsustainable for developers of all but the most popular apps. Consumers have paid dearly for their insistence on rock-bottom prices. A number of app developers have found that once fresh sales have dried up, there were ongoing costs to keep an app in the store, maintaining and improving it hoping for more new sales. This lack of a more reliable steady income has resulted in developers choosing to pull their often brilliant apps from the store or leave them to degrade while they desperately tried to create new apps drawing in fresh sales. Remember that Apple takes a 30% cut from each sale, plus charges developers a regular fee simply to keep an app available in the store. This leaves developers to continue to upgrade and maintain an app for years, in some cases, without any economic incentive other than through having a good reputation among users. That is an important motivation to be sure. However, for it to be of any use, more apps must be created constantly or there's no income. Make no mistake. While apps may often feel magically simple to use, it takes a lot of skill, dedication, and sustained effort to create them.

In an effort to tip the scales more in favour of sustaining developers and the apps they create, Apple has introduced a few

different economic models for developers to choose from. They can still offer their apps for a one-time fee as they've always been able to right from day one. This approach is still chosen by many developers. However, those one-time costs are increasing. It's no longer uncommon to pay above \$10 for a given app. Back in 2013/14, prices of \$10 or higher were rarely encountered and shocking. I paid a one-time fee for the Voice Dream Reader app and have enjoyed the ability to read all kinds of electronic documents and audiobooks ever since.

Another model involves in-app purchases. These have become famous through their heavy use in games. Examples in that area might include extra levels or advantages for players such as special powers or currency, etc. For other kinds of apps, in-app purchases let developers charge for extra features above those offered initially. I have an app called Ferrite Recording Studio that follows this model. I was able to choose from a few different sets of features or pay a one-time price to unlock everything. To cover any recording needs I might have going forward, I chose that latter option.

This also allows for developers to offer an app for free in the app store, letting people try it with no commitment. If they like the app, they can then pay to unlock the app or pay for something that improves the experience. An app called Nature

Space is a good example of this. It makes a large collection of recorded nature soundscapes available. Each of them may be purchased for around \$2 as in-app purchases. The app itself is free, so you only pay for the sounds that you actually want. It comes with a small number of these soundscapes that can be used at no cost, indefinitely.

For a long time, once you had purchased an app, you basically got any future updates for free. All very nice for the consumer but not good for developers who had to constantly maintain their apps and try to add features that attracted new sales. Now Apple has made it easier for developers to charge subscriptions or charge for upgrades. This will hopefully prove more sustainable for developers so we don't see so many great apps disappear for lack of new sales rather than a loyal and appreciative user base.

Paying a subscription for an app like you would for access to a streaming service has proved to be an increasingly popular financial model for developers. This has a number of advantages for people who like an app enough to pay a subscription. For one thing, people can try an app before they commit and make certain it works for them. This is wonderful for people who wish to see if apps are accessible, since they won't potentially be out any money if they find an app to be inaccessible. Additionally, app

developers will be far more economically motivated to keep current users happy and keep a steady income from a popular app going. They can spend more time improving and maintaining an app more sensibly rather than always chasing new sales just to keep afloat.

There is, needless to say, a degree of pushback from people who don't want to have to keep paying for apps along with other services they might subscribe to. This is popularly known as "subscription fatigue". As someone who had nearly a decade of not having to subscribe to apps I valued, I absolutely sympathize with these annoyed consumers having to adjust to this swiftly changing economic reality. However, I've seen too many brilliant apps and games that I only had to pay for once disappear from the app store or simply stop working as iOS changed around them. People are often genuinely unaware of the cost involved in simply keeping an app in the app store. Apple extracts a fee for this as well as taking a 30% cut from each sale. Also, there is the ongoing effort required to improve and maintain an app as the iOS operating system changes how things work. I believe this shift is ultimately a healthy one for people interested in apps that will last a long time and remain stable. The ongoing relationship with developers offers far more incentive to keep a good thing going and getting better.

Of course, subscriptions don't make good sense in all cases. Many apps are created with an idea of being used for a shorter while. Others are created with the hope of raising the profile of an app developer. Others are supported by advertising revenue. There are many apps that I would never think of paying a subscription for. If I'm to do so, there must be a compelling reason for that deeper relationship. I expect greater value for that commitment. Recently, I came across Castro. It's a podcast app that offers its core capabilities for free. This is good, since there are many alternative podcast apps including the one Apple provides with iOS. It takes a very different approach to organizing podcasts, and it also offers other features that make me feel that I'll get my money's worth by subscribing. The same holds true for the other apps that I subscribe to, namely Twitterrific, Ulysses, and MindNode. In each case, the apps and their developers have provided something that I value enough to support beyond a one-time purchase.

There's an outcry of worry that people will find themselves nicked and dined to death as developers switch on mass to a subscription model. I know better than to worry. Having something over three hundred apps and games, I currently only pay subscriptions for four apps that aren't content providers like Netflix. In each case, I could have found other

alternatives. I haven't been forced to pay subscriptions to accomplish anything. These have been choices I've made freely, because the approach taken by the particular apps is more suitable to my current needs. People are still figuring out the conventions of which economic model is best for different kinds of apps. Apple has gradually opened up to more possibilities. The basic problem is that many excellent apps are only useful to a smaller subset of users. They don't generate the kind of sales needed to remain viable and disappear after a while. Consumers were living in ignorance of the economic stresses the people who tried making a living through creating apps were going through. Now developers have more room to find their economic feet.

Taking Stock

What does it mean when I say that I'm very invested in the Apple ecosystem? Quite simply, I would lose a lot of built up assets if Apple were to suddenly shut down or make decisions I truly couldn't live with. Take my happy arrangement regarding Apple Music. I have crafted a library of nearly ten thousand tracks. This grows as I try out new albums and decide they're worth adding. It also shrinks slowly as I decide I don't like a particular track and remove it from my library. I also built playlists as I added albums or songs so that I have one list with actual songs and another with instrumental music that I

have playing while I write. Furthermore, I have a smaller selection of music that I have deemed worthy of keeping on my iPhone so I can hear it without using data while not connected to WiFi. If Apple ever decided to pull the plug on the Apple Music service, all of that work and most of that music would simply vanish on me. This would also happen if I stopped paying Apple around \$10 per month to have access to the Apple Music service. At best, I might be able to export the playlists for my own keeping, and then use them with another streaming service or slowly purchase the albums I truly valued. It would be painful. However, I don't believe there's any near-term danger of this happening, so I remain happy. I have enough faith in how Apple has handled things so far.

There are many other ways that I have become deeply invested over the years. There are the hundreds of apps and games I've purchased. They won't run on anything that isn't an iOS device and only Apple designs those. I have taken the time to master VoiceOver and become versed in all aspects of the iOS user experience. I pay for extra iCloud storage. There are all sorts of things both financial and mental. Over the years, Apple has earned my trust, admiration, affection, and appreciation. I feel won over fair and square. Even if someone came out with a truly better more affordable system tomorrow, I would be very

hesitant to jump ship at this point. If you use an iOS device to anywhere near its full potential, you'll quite possibly feel similarly to me. Users of Android devices develop similar attachment to their chosen ecosystem, which has its own advantages and pitfalls.

I felt that it was very important to write about this aspect of ownership. In my experience, it presents a long-term economic choice of a kind that blind people have never been able to contemplate before. iOS devices offer blind consumers the chance to really leverage large-scale marketing to our advantage rather than have niche marketing force us to pay more for far less capability. At the same time, I hope I've made the potential pitfalls that come with those economics clear enough. I would much rather have people read this and decide not to enter the Apple ecosystem than have people who end up bitterly disappointed and feeling trapped wishing they understood the implications better earlier. It was only very slowly, long after I had purchased my first iPhone, that many of the implications of this choice became clear. I have no regrets at all and am convinced I've made the best choice possible for me given my circumstances and abilities. However, other people might choose to dip their toes in carefully while they try things out.

One final bit of overall advice I feel compelled to pass on now rather than later is that you never put off enjoying what you purchase or obtain in the belief that it's truly permanent. Apple's publishing rights and rules can and do change over time. Also, due to technology updates, things might not be workable or available to yourself and others down the road. I've had a few slightly painful personal examples of this. For instance, one Apple book I was very much hoping to finish is called *Franklin's Lost Ships*. I bought the book the year that the remains of the Franklin expedition were found in the arctic. I had read around a quarter of the book but got distracted by other books for a time. When I once more tried to continue reading it, I was dismayed to find that it wouldn't read properly anymore using VoiceOver. I could still read it word by word, but that's no way to enjoy a book. I still hope that things will once again come to a point where I can finish reading it enjoyably.

Technical advances and harsh economics have also rendered some apps and a few truly remarkable audio games unusable and unavailable in the app store. I dearly wish I had more fully experienced these now lost treasures while I had the chance. I had simply made a false assumption that things would remain as enjoyable and available as when I had first bought them. Another very good and accessible game has more recently fallen fowl of a

rule change by Apple in an attempt to combat gambling fraud. They decided to remove all apps that even simulated gambling from the app store. There was a procedure for developers to receive exemptions from this purge. Larger companies could complete it and have their apps stay provided they passed scrutiny. However, developers of accessible games tend to be very small, and the developer of Fruit Pot simply couldn't expend the resources to go through this procedure. As a result the blind community lost a stupendously good slot machine simulation game that didn't even have in-app purchases. Thankfully, in this case, the developer wasn't lost to us, and we will enjoy at least one new game from him.

You don't have to worry constantly that things will disappear or become unworkable very often. For the most part, developers keep their apps up to date. I'm still using some apps that I've had since my first year of owning an iPhone. All of the other books I've purchased in Apple Books are still perfectly readable. These instances are rare, but they can and will eventually happen to you. Change is an integral part of the iOS ecosystem.

Ultimately, I'm deeply grateful for the massively increased engagement with cherished aspects of life that Apple's iPhone and ecosystem has made possible for me. it has been well worth

putting up with such issues to reap the immense benefits of participating in this ecosystem. The vast majority of my experience in the world that Apple built has been quite positive. That makes me far more inclined to forgive the inconveniences inflicted on me as Apple tries very hard to please as many of its customers as possible. I know there'll be other bumps in the road for me going forward. However, in my experience, Apple has done a pretty good job of addressing problems relatively quickly. I hope this look at the Apple ecosystem helps people understand what's going on and be more effective when they rightly complain, ask for change, or simply opt out of the whole enterprise.

VoiceOver: Living Blind on a Touchscreen

Much has been made of how easy it is for sighted people to pick up and intuitively learn how to use iOS devices. There is somewhat more of a learning curve for blind people who wish to achieve a similar degree of total control. First made available for iOS devices when the iPhone 3 GS was released in June of 2009, VoiceOver has matured into a robust combination of screen reader and interface. Simply put, VoiceOver lets blind people use iOS devices with their hands touching the screen or via external devices. It reads information displayed on the screen and allows blind people to control their device completely and with competence.

People who can see are able to simply tap on a desired icon to activate it. This would be disastrous for blind people who need to be able to explore the screen without accidentally causing things to happen. VoiceOver must, therefore, change how your device behaves so that you can feel around and find the correct letter, number, or icon, and then tap twice on it quickly to indicate your intentional and informed choice. There are also other special gestures that make controlling things easier. For sighted people, these gestures would be counterintuitive and harder to master.

VoiceOver does what other screen readers like NVDA for Windows computers does. It has a philosophy that encourages you to explore the screen with your finger and thereby gain an understanding of where things are. If there's one thing to always bare in mind, it's that you should never presume that everything is read out automatically. Always take the time to fully explore the screen of an app to make certain you know about all that is present including available options. It is possible to reach everything by flicking left and right between elements. They will be moved to in left to right top to bottom order. However, that can prove a slow and tedious way to navigate a busy screen full of information and controls. Learning where things are allows you to touch an area on or near the element of interest and flick quickly to what you want. This also gives you, as a blind person, the ability to truly have a sense of how an app is laid out on the screen.

VoiceOver does a whole lot including changing how your iOS device responds to touches and other gestures. Using VoiceOver lets me read a web page, fill in a form on that page, and interact. Siri, on the other hand, would simply take me to the page and leave me stranded if sighted help or VoiceOver weren't available. I can surf the web with ease using a number of different browsers filling out forms and shopping online. I can

write a document such as this guide using an award-winning writing app called Ulysses due to its developers adding support for VoiceOver. While in the Word of Promise Bible app, I can quickly navigate and read the Old and New Testaments with ease and efficiency. Because of VoiceOver, I can play a complex game like Six Ages: Ride Like the Wind, reading the results of my moves and selecting options with as much skill and confidence as any sighted player. Provided an app supports VoiceOver, I can make use of its controls and interface. This even includes really visual apps such as the Camera app and the Maps GPS app.

While much of VoiceOver's capability is in the user's control, a great deal of how well it works with various apps is in the hands of app developers. Apple provides a lot of options they can use behind the scenes to effect how well VoiceOver and other accessibility tools work with their apps. This section is mainly focused on elements of VoiceOver that are within the user's control. However, it's important for people to be aware that proactive developers who take the time to understand how VoiceOver works have a lot of latitude to optimize the experience of blind users. Should you find an app to be inaccessible, make certain developers are aware of the ability they have to broaden their potential audience by using accessibility tools including VoiceOver. You and they can find

out a lot about how things work behind the scenes by looking at the developer resources found at www.apple.com/accessibility.

Typing on a touchscreen is a perfect example of both how deeply VoiceOver changes the iOS experience and how flexible it can be. For sighted people, simply tapping on a letter or number found on an app's onscreen keyboard would result in that character being entered. Such a situation would be quite untenable for a blind person, especially while he or she was just learning where keys were. Therefore, VoiceOver provides three alternative typing modes or styles.

Overall, the philosophy of VoiceOver is to offer more than one approach to things so that people with varying abilities can ultimately accomplish tasks. There may be methods that are faster for most people, but you shouldn't feel that there is a right or wrong method. Find what works best for you among the options provided. It's well worth your time to experiment and try different methods again once you've gained more general proficiency. Through this process of trying methods out, you'll come up with your own best practices.

Help, Hints, and Recovering From Unwelcome Silence

VoiceOver conveys tremendous control and capability to blind users. However, it is a far from perfect system. There is a substantial learning curve for new users with little help

provided in a way that beginners might easily find out about. While there are good instructions on how to use VoiceOver in the *iOS User Guide*, you need to have a basic grasp of VoiceOver before you'll be able to access them using your iOS device. Apple does provide accessible Braille and tagged HTML copies of the user guides on their website at www.apple.com/accessibility.

However, these aren't always kept fully up to date. Also, nothing points people in that direction when they purchase these devices. While there is a tutorial for owners of Apple Macintosh computers that takes beginners to a level of basic competence with VoiceOver, there is no such similar facility for iOS. This would, I believe, help tremendously, and I have advocated for this to be created more than once. Without sight, the initial learning curve is simply too steep for too many people. That initial difficulty is deceptive, though. Once the basics are understood, things start to be very intuitive and feel natural.

To help beginners learn how to do things, VoiceOver does offer a Practice mode that lets you safely practice gestures or key commands if you're using a Braille display or Bluetooth Keyboard. You can enter and leave this mode by tapping the screen twice quickly with four fingers at once. While in this mode, VoiceOver will respond to any touches or gestures by

briefly explaining what that gesture would accomplish outside of Practice mode.

Another extremely useful facility included with VoiceOver are Hints. These are enabled by default and give new users small doses of instruction as they navigate the screen. If, for some reason, you aren't hearing helpful sentences like "slide up and down with one finger to adjust the value", or "double tap to open", then you have somehow managed to disable Hints. Here is how to reach that setting and enable them:

How to Enable VoiceOver Hints

1. Presuming you're finished setting up and your device is connected to cellular data or WiFi, you can simply hold in the Home or Action button until a beep is heard and say "show VoiceOver settings". Siri will then take you there provided that Siri understood your words.
2. If Siri isn't available to you, find the Settings app on your home screen and double tap that.
3. Flick right through the settings until you come to Accessibility and double tap that.
4. Next, flick right until you find VoiceOver and double tap that. This works when VoiceOver is activated. If you're instructing a sighted person how to do this, they simply need to tap once on the icons mentioned above.
5. This area allows you to configure how VoiceOver behaves. We'll be coming back here often while learning about VoiceOver. Flick right until you hear Verbosity and double tap this. Then, flick right until you hear Hints. It will indicate whether they are enabled or disabled. Double tap on the Hints option to toggle it on or off.
6. To exit this section of Settings, you can hit the Back button to return to the VoiceOver settings or else hit the Home button or use the equivalent gesture to exit Settings altogether.

There are many settings you can adjust that change how VoiceOver behaves and what it speaks. They are all found in the VoiceOver section of the Settings app, with the important exception of one. This exception is called the Accessibility

Shortcut, and before we go any further, we will set that to VoiceOver. This will let you turn VoiceOver on or off via the Home or Action button by pressing it three times quickly. This is useful in countless situations, such as if VoiceOver stops speaking due to a bug in the system, or when using apps that are self-voicing and don't need VoiceOver running to be used. Many games do this. Also, it may be useful to turn off VoiceOver quickly to let a sighted friend make use of your iPhone. To set this shortcut:

How to Set the Accessibility Shortcut to VoiceOver

1. Find and double tap the Settings app.
2. Flick right until you come to Accessibility and double tap this.
3. Flick right through all the settings until you come to Accessibility Shortcut and double tap this. It is the very last setting.
4. Flick right until you come to VoiceOver and double tap this.
5. Tap the Home button to get out of Settings or use the Back button at the top left of the screen to go back to the previous branch of the settings tree.

Getting to VoiceOver settings can be done in a few ways. Presuming you're all set up and connected to the Internet, the quickest way to get there is:

1. Hold the Home or Action button down until you hear a beep.
2. Say "show VoiceOver settings".
3. You should be placed in the correct section within the Settings app regardless of where you were before you invoked Siri.
4. Otherwise, from your home screen, double tap the Settings app.
5. Flick right until you hear Accessibility and double tap this.
6. Flick right until you hear VoiceOver On Button and double tap this.

There are a large number of settings that change how VoiceOver behaves to suit your liking. This includes everything from how rapidly the voice speaks, to whether punctuation is announced, to which style of Braille is used if you connect a Braille display to your device, etc. We will discuss all of these in a later part of this section.

What to do if VoiceOver Stops Talking

VoiceOver is now over ten years old but still a far from perfect system. You will inevitably encounter a situation where Braille or spoken input that you expect simply doesn't happen. You'll be in the middle of working on a document and just want to pop over and check out a website. The next thing you know, your device has gone silent. Perhaps, you've decided to try out a new and possibly helpful app, and your device goes unexpectedly quiet. It can happen at the most inopportune times, leaving you with a frustration and sense of powerlessness I'm profoundly familiar with. Trust me. I know that sinking feeling in the pit of your stomach or that vexation that makes you want to throw your device into the nearest wall hard enough to split atoms. I've absolutely been there.

All sorts of things can cause VoiceOver to lock up. It could be a bug in the operating system. Some apps haven't been designed to work with VoiceOver and may cause it to crash when

they are run. Perhaps, a website has been poorly put together and something in it has caused VoiceOver to crash. Sometimes, too much is happening at once and the system just freezes up. In such circumstances, the most natural but counterproductive thing you can do is panic. If you've set up your Accessibility Shortcut as I outlined how to do above, you are actually well prepared for most of these situations. In all likelihood, your device isn't broken. In the worst case, which isn't at all likely, you may need the assistance of a person with sight to help return your device to a state where VoiceOver is running. Nearly all of the time, you will be able to rectify the situation on your own without sighted assistance. Unless you have already reacted in a destructive manner, nothing has been lost but time and your self composure. Take a deep breath and we'll walk through what needs to be done to recover from such an unfortunate happenstance.

When VoiceOver stops working, that doesn't necessarily mean that it has completely shut down. You may, in fact, sometimes still hear the small sound effects VoiceOver uses to inform you of things. In any case, it needs to be completely shut down and restarted to pass the jammed state that it has entered. This can be done in a few different ways. The most drastic step is a hard reset, so let's save that for the last resort. Theoretically, a

hard reset shouldn't cause any information to be lost. However, you'll have to wait while your device reboots and will lose your place in whatever you were doing.

Presuming you're still online via cellular data or WiFi, Siri can come to the rescue. If you've set this up, you could simply say "hey Siri" to cause your digital assistant to perk up its ears. Otherwise, hold down the Home or Action button until you hear a short beep. At that point, tell Siri to "turn off VoiceOver". This makes certain that VoiceOver has shut down completely and can start up fresh. Siri should inform you that VoiceOver is turned off. Sometimes, you may have to repeat this process. Next, follow the same process for summoning Siri and ask it to "turn on VoiceOver". Again, you may need to do this more than once depending on the kind of jam things have gotten into. If all goes well, you should be informed that VoiceOver is turned on and your device should speak or output Braille as normal.

An even quicker way is to make use of the Accessibility Shortcut. Presuming you've set that up, invoke the shortcut by clicking the Home or Action button three times rapidly. You may have to do this twice to shut down and then reactivate VoiceOver. I've sometimes run into circumstances where I've needed to invoke the shortcut three times to get VoiceOver up

and running. Don't forget to pause between each series of three clicks. This will prevent five clicks in a row from being counted. While not quite as consequential as with Monty Python's "The Holy Hand Grenade of Antioch", five rapid clicks in a row will activate the emergency SOS mode, which might result in an unintended call to your local emergency services. Perturbing as it is, your device failing to Braille or speak to you really doesn't warrant ambulance, fire truck, or police intervention, so let's not go there.

I have yet to encounter a circumstance where two or three applications of the Accessibility Shortcut didn't set things right. However, such situations are possible. In that event, you may have to perform a hard reset. This forces your device to completely reboot. To perform a hard reset on a modern iOS device:

1. Push and release the Volume Up button.
2. Push and release the Volume Down button.
3. Push and hold in the Action button on the side of your device. Hold that button in for around ten to fifteen seconds. This should make certain that a hard reset initiates.

At this point, you should wait for at least a minute or two while the reset is hopefully happening. After this pause, you may find that VoiceOver simply start speaking and that things are back to normal. If this isn't the case, you can invoke the Accessibility Shortcut by clicking the Home or Action button

three times rapidly. This will work even while your device is locked and offline. Alternatively, you may summon Siri and ask it to "turn on VoiceOver".

Hopefully, the above steps will help you recover from most situations that result in unexpected silence or lack of response from your device. Don't forget to check the volume level by pressing the Volume Up button a few times. The mute switch doesn't interfere with VoiceOver, so its position shouldn't matter aside from incoming phone calls and other alerts. There are also periods such as while the device is booting up and while updates to the operating system are installed when there can be longer periods of silence. Should you wonder whether your device is turned on, the act of plugging it in to charge or resting it on a wireless charger will force the device to boot up. It will then make a small sound and you will feel a bump as it finishes the startup process. This bump is actually to inform you that the device is charging rather than that it has finished booting. If your device isn't plugged in, you won't feel a bump or hear the charging "bing". A bit of tactile feedback when one's device was turned on would have been a very welcome and thoughtful addition on Apple's part. This would help blind, deaf-blind and even people whose eyes were focused elsewhere to know that their device was powered up.

The Three Typing Modes and Typing Feedback

Right from the beginning as you set up your device, understanding how to type using the onscreen keyboard is absolutely essential. Doing this efficiently can be quite a challenge especially for blind beginners who are used to typing on physical keyboards. In this subsection, we will examine the three approaches offered by the VoiceOver interface. We will also cover the options for receiving feedback while typing. My advice is to take it slow and careful while getting the hang of things. I kept wanting to fly along at the same sort of speed I can manage on a physical keyboard. This was never a reasonable expectation. Even after years of constant practice, I'm nowhere near as fast and use a physical keyboard for any lengthy writing I do on my iPhone. However, within a month of getting my first iPhone, I was able to reach a point where I could answer text messages and do other short writing at a speed that didn't leave people waiting for ages while I struggled. I hope these explanations help you figure out which one of the three approaches will best suit your needs.

VoiceOver offers three different typing modes or styles. Apple has never settled on either of these terms and uses them interchangeably in the documentation and in iOS itself. When you find them in the rotor, they're referred to as "Typing Mode". In

VoiceOver settings, they are referred to as "Typing Style". These styles are called Standard, Touch, and Direct Touch. Let's discuss each of these in turn:

Standard Typing

The style selected by default is the most friendly for beginners. Using this method, you are free to take all of the time you need to feel around the keyboard until you find the character you wish to enter. Alternatively, you can flick left or right to move through the various keys in top to bottom left to right sequence. Once you have found the character you want, you can lift your finger and then tap twice quickly to enter that character. If you find that this requires too much coordination, you can perform what is known as a "split tap". To do this, keep your finger held down on the character you want. While doing this, use another finger to tap once anywhere on the screen. This will type the character, and it will be spoken so you know that it was typed. For example, I might want to enter the letter "a". Feeling around the left side of the keyboard, I find the "a" hearing it spoken. At that point, I lift my finger from the keyboard but keep its position above the "a" character. I then tap twice quickly to enter the "a". Alternatively, I could use a split tap by keeping my finger on the "a" and using

another finger, perhaps on my free hand, to tap anywhere else on the screen. I would then hear the "a" spoken as it was entered.

This style offers the maximum level of forgiveness while people become used to typing on a keyboard modelled after the QWERTY keyboard but on a flat surface. You can take all the time you need and feel where keys are without worrying about accidentally entering anything. Nothing happens unless you use a double tap or split tap to firmly indicate your intentions. This includes the Delete and Return buttons, and the more Numbers, more Letters and more Symbols buttons that give access to those different sets of characters.

Touch Typing

While very forgiving, many people eventually find that the Standard Typing style is cumbersome. The Touch Typing style offers the potential for much greater speed in exchange for some of the forgiveness offered by Standard Typing. Once you have developed enough of a mental map to know roughly where characters are on the screen, it normally doesn't take much time to find the right one. Using the Touch Typing style, you can put your finger on the keyboard and then slide your finger around to find the correct key keeping your finger on the screen. When you come to the right character, simply lift your finger and it will be entered instantly. This style is the one I like best. I moved

to it within months of getting my first iPhone. Just don't leave your finger in one spot for more than a second or so. If you do, an alternative set of symbols will appear for you to select from. These symbols are ones that aren't used quite as often but are nonetheless handy. These include symbols for different currencies, accents, and many more. Provided you keep moving your finger, this switch won't occur. The worst that can happen is that you'll have to delete a symbol you didn't actually want.

You gain speed by not having to be as accurate, since you can quickly slide your finger to the correct character. You then quickly lift the finger to have the character entered and place it at or near the next needed character. I found this method far more intuitive and speedy for me. You don't need to double tap or split tap all the time and can just zip along.

Direct Touch Typing

This style is for people with extremely good muscle memory and hand coordination. Essentially, VoiceOver gets out of the way, allowing you to simply touch characters and have them be entered instantly exactly like sighted people would type. This offers maximal speed for people with the coordination and precision required to make use of it. Those who don't have these abilities will find Direct Touch typing an exercise in

frustration, as they will need to delete wrongly entered characters constantly.

Obtaining Feedback While Typing

Most screen readers refer to this as "typing echo". The basic idea is that when characters are entered, you can choose what kind of feedback you receive. There are four choices here.

The first is "none" to have no feedback at all. This is what I prefer when I use a reliable physical keyboard. Characters won't be spoken when entered. If you're using an onscreen keyboard, you will still hear the characters your finger moves over.

The next choice is "characters". This results in hearing characters when you find them onscreen as well as hearing the same character spoken again when entered. This gives you confidence that you know precisely what ends up being entered as opposed to felt so you know that your finger didn't slip to a wrong character.

The next choice is "words". Rather than reading each character entered you will instead hear words as they are completed by a space or punctuation mark. This gives you the confidence of hearing the words when they're completed. It can be less annoying than hearing each character spoken twice.

The final choice is "characters and words". It speaks each character entered plus the words you complete, giving you maximum feedback. This could potentially be useful in situations where noise level or other distraction is high.

You can select which kind of typing feedback you prefer in the VoiceOver settings. Simply double tap the choice you want, and it will be marked as selected. This is also where you will find the Typing Style setting. While the rotor may also be used to switch between typing styles, you cannot use it to select your preferred typing feedback and will always need to go into VoiceOver settings to change it.

I find that while using the onscreen keyboard, the "characters" feedback choice works best for me. Should my finger slide while being lifted from the screen, I'll know right away that a wrong character was entered. Meanwhile, if I'm typing on a physical keyboard that I'm familiar with and can fully trust, I tend to prefer "no feedback". This lets me write the most efficiently.

The Rotor

One of the first things I heard about when people first began telling me about VoiceOver was the rotor. I'm old enough to remember rotary dials on telephones I used as a child. That gave me an instant grasp of how this idea was supposed to work.

A lot of things used to have knobs that you would turn to control them. In this era of flat touchscreens and buttons, people aren't as familiar with turning dials and knobs. Especially younger people. I guess it's perfectly possible to be in one's twenties and never have had the experience of turning a dial or knob. For me, this concept was an absolutely delightful no-brainer. I took to it immediately.

Your iOS experience will be infinitely better if you take the time to learn the VoiceOver rotor. Apple has used it to make navigation and a whole lot of other things easier and more efficient for blind people using iOS. Imagine a knob sticking out from your screen. It can be anywhere on the screen that is most comfortable for you. The size of the knob is also whatever is comfortable for you, provided there's at least a little space between the two fingertips you'll use to turn the knob. Place the tips of two fingers on the screen as if you were gently pinching a small marble between them. You then turn that imaginary knob left or right with your fingers. This rotates through a circular menu of options that determine what flicking upward or downward with one finger will do. I got used to this within an hour of getting my iPhone, although some of the implications took a bit longer to find natural.

To get used to this sort of thing, the easiest place to start is by adjusting slider controls for things you can immediately hear like speaking rate or volume. For sliders like speech rate or volume, turn the rotor until you hear what you want to adjust. Once that's done, merely flicking up or down would adjust the value. For instance, if you turn the rotor to Speaking Rate and flick up with one finger, the rate of speech will get faster. Once you're happy with the speaking rate or other value you've adjusted, turn the rotor to a safe setting like Headings, Characters or Words. This way, you won't suddenly be surprised when the speed changes or the volume goes down if you happen to flick up or down by accident. Remember that the rotor is always pointed at something. If you can't remember what that is, simply turn it left or right and it will announce what it points at. The rotor is absolutely never pointing at nothing.

While the rotor is circular and will rap around back to the first option if you keep turning it in the same direction, that isn't always the case for flicking up or down. If your rotor is set to Speaking Rate and you flick down to 0%, flicking down again won't shoot up to the top value. On the other hand, if you set the rotor to Language and flick up or down, it will rap so that you'll keep cycling through your language choices and don't have to flick back through them.

Something that really threw me for a loop at first was moving through documents. I was used to doing that with arrow keys where you could move left or right when proceeding by character or word, and up or down to move by lines. Using an iOS device without a physical keyboard, you'd turn the rotor to Characters or Words and then move up or down to go backward or forward along the current line, respectively. Instead of holding down a key to move by words, the trick is to turn the rotor to the amount you want to move by, and then flick up or down once for each unit you want to travel. That holds true for Lines and Headings, so it's actually more consistent. Meanwhile, if you flick left or right while in an edit field, you move out of that field to the closest element in the rest of the app in sequence top to bottom and left to right. An edit field is a single element containing your document. Other elements may be options such as an Edit or Settings button or Document Export button. Some apps have a Word Count or other status information that may be treated as one or more display elements within an app. The rotor, therefore, helps you navigate within your document or within other single elements rather than moving to other parts of an app.

There are a few different kinds of options that can be on the rotor. Before we go any farther, lets go over the various

types so you have a sense of what you're working with as you explore.

Navigational Rotor Options

Navigational options are on the rotor to help you move quickly through whatever information or controls you might need as you use your device. For instance, turning the rotor to the Words setting lets you move forward or backward by one word at a time. The Headings setting lets you jump back or forward through a document or web page by heading. This can be a very efficient way of moving through to areas of interest. A particularly noteworthy setting in the navigational category is the Vertical Navigation setting that lets you move directly up or down via upward or downward flicks. This can make reading maps and tables, and even examining game boards, easier.

A good many of these options are particularly useful for browsing websites. Depending on how much control you want, removing some of these options can declutter your rotor. For instance, I like moving to the next or prior Link but don't need to move to the next Non-Visited Link. Similarly, I don't have the option to move to the next Text Field on my rotor but appreciate the one that moves you to the next or prior Form Control. To make these movements, you need only flick up or down with one finger once you turn the rotor to the desired setting.

Sliders and Switches

Sliders and switches are similar rotor options. Simply turn to what you want to adjust and flick up or down. If you're dealing with a slider, the value will increase if you flick upward or decrease if you flick downward. For example, turning the rotor to Speaking Rate and flicking downward will slow the rate of speech down. Flicking up would cause the rate of speech to increase. Sliders like Volume and Speaking Rate don't rap around. When you try to move past 0% for Volume, it won't suddenly fly up to 100% and yell at you. To gain volume back again, you'll need to flick upward with one finger.

Switches will allow you to turn a feature on or off. Unlike actual switches, flicking in the same direction will toggle the setting between on or off. I will often do this with the Audio Ducking option. This option determines whether any other audio, such as music you're playing, automatically drops in volume while VoiceOver speaks. This is a very handy feature that makes certain that what VoiceOver says to you will never be drowned out by music or an action movie, etc. When I'm working, I quite often turn on Audio Ducking. I simply turn to the Audio Ducking setting and flick either up or down. Either direction will do, since all you're doing is toggling between two selections, those

being on or off. Other switches work the same way such as those for VoiceOver Hints and for Sounds.

This Sounds setting refers to VoiceOver-related audio cues. These short and relatively unobtrusive noises help indicate movement to new lines and other events without the need for spoken words that might break up the flow of information. I would advise beginners to leave both Audio Ducking and Sounds in the on position while they learn how to use VoiceOver. Both are very useful features and should only be turned off when there's a good reason.

Why, you might well wonder, would anyone want to turn off features like these? Sometimes, features meant to be helpful can get in your way when you're trying to do things as rapidly as possible. You might not want to always hear Hints once you're a competent VoiceOver user. Here's another example: With Audio Ducking, there are many occasions, like when listening to a show, where you really don't want some random notification causing VoiceOver to prevent you from hearing what someone in the show says. That's when it's good to be able to turn the rotor to Audio Ducking and flick up or down to turn the feature off. This can also be helpful if you're chatting with one or more people and don't want to miss out on what they're saying

due to the volume of the conversation dropping whenever VoiceOver speaks.

Special Positions

Some rotor settings are special ones. For example, the Braille Screen Input setting will activate that method of input whenever the rotor is set there. You need not double tap to execute this choice. Merely turn the rotor to that setting, and you're off and running. The same goes for the Handwriting setting that lets you write characters on the screen rather than typing them. To dismiss these input methods, you need only turn the rotor to another setting.

If you turn the rotor to Actions, you uncover a menu of all actions you can take given the current element in focus. flicking up or down moves through that context-sensitive menu, and double tapping on a choice executes it. If you move over an element where actions are available, the rotor will automatically turn to Actions. One example of this is when you delete a voice from your iOS device. That takes advantage of the Actions setting. Another place where you'll find Actions is when you move to a song in the Music app. Flicking up or down will cycle through available Actions.

This can sometimes be annoying when you're moving over the editing field of a word processing app. If you forget to double

tap on that field, thereby entering editing mode, you will find a series of Actions rather than the words you might have expected when you flick up or down to navigate the document.

It's always a good idea to check different parts of an app if you hear VoiceOver say "actions available". This is one way that VoiceOver lets blind people access things that might be visible on toolbars in an app's display. Another is the Edit rotor setting. This makes it possible to Cut, Copy, and Paste text, as well as perform other tasks associated with editing. Similar to when using the ACTIONS menu, you need to double tap on the Action you want to choose.

In iOS 11, it became possible for developers to add custom rotor options that work within their apps. These could be used to speak information or make options more practical to use. For instance, in the BlindSquare GPS navigation app, you might find yourself missing a spoken message, because you needed to pay attention to your surroundings. Being able to quickly go over the last few spoken messages quickly could prove handy in keeping your bearings while travelling. Therefore, the developers of BlindSquare have added the Speech History rotor setting. Turning to this setting, you simply need to flick upward to hear prior spoken messages. If developers take the time to include such features, you will be able to find out

about them in the help or other documentation provided for that specific app. As this capability was only recently introduced, awareness of it is still spreading among app developers. I look forward to experiencing the many ingenious uses developers come up with in the years ahead as more of them learn about the possibility of adding custom rotor options to their apps. There's a great deal of untapped potential in this capability.

Voices of Choice

Now that we've gotten you to this point, it's time to let you in on something. You're not stuck with the default voice that VoiceOver has used to speak to you with up to this point. Apple makes a small but growing collection of voices available, and you don't need to pay for them. However, they do take up data storage space on your iOS device. Make certain you're connected to WiFi before downloading these voices. Even the smallest of them are over 100 megabytes (MB) in size. Some of the better voices are more than half a gigabyte. Alex, a high-quality voice made by Apple, is the largest voice available so far. It takes up over 800 MB. However, Alex is unique in that he simulates breathing as he reads. Many people, myself included, think he's well worth his bulk. Others, including my wife Sara, think Alex is a bit creepy and prefer other voices. Thankfully, there are at least a couple of choices for each supported

language. At a bare minimum, there will be a male and female voice.

To download voices and add languages to your rotor, go into VoiceOver settings and then into Speech. Once there, flick right and you'll hear what the default voice is. You will also find numerous settings including Rate and Volume that you can adjust. Notice that the voice name is a button. Double tap that button, and you can change to a different default voice. The change would only take effect after the chosen voice finishes downloading. That's also the case if you change the active voice for a language on the Language Rotor. It's possible to have more voices on your iOS device if you wish. For instance, if you want a male and female voice for a given language, you can do so. However, only one can occupy the slot on the Language Rotor and be ready to be quickly brought into service.

How to Do It: Adding a New Language to the Language Rotor and Choosing a Voice

Presuming you're in the VoiceOver Speech Settings:

1. Flick right until you reach the Add New Language button.
2. Double tap this button with one finger. This takes you into a list of languages.
3. Flick right through the languages until you hear one that you're familiar with and want to try. Double tap this and VoiceOver should say "selected" whenever you flick over that particular language on the list. Note that a language may have one or more dialects. Each of these counts as a separate language and can have a slot on the Language Rotor. Thus, you can have a default voice, an English US voice, and an English UK, South African, and Irish voice.

4. Once you've selected one or more languages, flick left with one finger or touch near the top left of the screen to reach the Back button. Double tap this with one finger.
5. At this point, flicking right over the available options, you will find buttons for each language you have added. Double tap one of these buttons with a finger.
6. Now you're in the list of available voices for that language. Flick right over the choices and double tap the Download button of the one you'd like to try with one finger. The voice will then be downloaded.
7. Flick left and double tap on the name of the voice with one finger after it has downloaded. That voice will now say "selected" and will be the active voice in that language slot.
8. To try this new voice, turn the rotor to the Language setting.
9. Flick up or down with one finger through the available options. There will be at least two, including the default slot and the language you've added. Continuing to flick in either direction will rap through any available options endlessly. You simply need to turn the rotor to something else after you are happy with the language selected.

Should space become tight, it is possible to delete extra voices. You simply go into their language in the VoiceOver Speech settings and flick down while on a voice's name. You will eventually reach the Delete option and can then double tap with one finger to remove the voice from your device. Whenever a new version of iOS comes out, it's a good idea to check in the Speech area for possible new voices in your language or dialect of choice. In iOS 12, there are new South African and Irish English voices. iOS 13 saw the addition of Indian voices. These voices are often added for use with Siri but can also be used by VoiceOver.

Selecting Text

Thanks to the rotor, selecting, copying, cutting and pasting text are all done quite easily. To use your rotor for this purpose, the Text Selection setting must be available on

your rotor. It may not be there by default, so you may have to add it. We'll go over adding, ordering, and removing items from your rotor later. Once you turn to the Text Selection setting, flicking up or down adjusts the unit of movement that the cursor will travel and select. To select text, flick right to expand the selected content by one unit of movement. Flick left to shrink the selected area by a unit of movement. You can change the unit of movement to fine-tune what is selected. For instance, you could select a few lines of text and then flick up to set the movement unit to Words so that you can then flick left to remove one or more words you didn't want selected.

Let's use a sentence as an example. "The quick brown fox jumped over the lazy dog." To remove "The quick brown fox", follow these steps:

1. Turn the rotor to Characters or Words and move to the start of the word "The".
2. Next, turn the rotor to Text Selection.
3. Flick up or down to cycle through the units of movement until you come to Words.
4. Flick right a few times and you will hear "The quick brown fox" marked as selected.
5. Find the Delete key near the bottom right of the virtual keyboard or hit the Delete key on your physical keyboard if you're using one. This will delete the selected text.

Sticking with our example sentence, let's tackle cutting and pasting text. We'll pivot the two ends of the sentence around "jumped over". When we're done, "the lazy dog" will jump over "the quick brown fox". Follow these steps:

1. Select "The quick brown fox" precisely as we did above.

2. Next, turn the rotor to the Edit setting. This gives you access to a menu of common editing actions.
3. Flick up or down until you come to Cut, and double tap with one finger to perform the action. "The quick brown fox" is now removed from its customary home at the start of the sentence and is in your clipboard. This is a temporary storage place where things are put until they are copied or pasted elsewhere.
4. Turn the rotor to Characters or Words, and flick down to get past "jumped over". Hit the space key to leave a space after "over".
5. Turn the rotor until you reach Edit, and then flick down until you get to Paste. Double tap with one finger to Paste "The quick brown fox" after "jumped over".
6. Next, turn the rotor to Characters or Words, and flick down over that "quick brown fox". Get to the start of "the lazy dog".
7. Turn the rotor to Text Selection and set the movement unit to Word Selection. Flick right three times to Select "the lazy dog".
8. Turn the rotor to Edit and flick up or down until you reach Cut. Double tap this with one finger and "the lazy dog" will be hoisted into your clipboard.
9. Turn the rotor to Characters or Words and move to before the words "jumped over". Put a space before the "j" in "jumped" and flick up to move to before that space. This way, our last step will place "the lazy dog" perfectly in his new home at the start of the sentence.
10. Turn the rotor to Edit and flick up or down to find Paste. Double tap this, and you're all done. The spacing may not be perfect, but we've achieved our aim.

This works on whole blocks of text, allowing you to easily reorder chunks of the document you're working on. It lets you quickly select precisely the text you want to share from an email, use the edit setting to cut that text to the clipboard, go to the email you're composing, and paste the text from the other one right into it. It also works that way for web pages and anywhere else you're allowed to copy or edit text. You *can't* use it to copy a commercial ebook and paste the whole thing into a document, thereby defeating digital copy protection.

Written out as a list of steps, the text selection process sounds far less intuitive and natural than it will actually feel after you've used text selection a few times. It's all turns and flicks. Part of my sense of how easy text selection and movement actually is, is that I had to live through how nearly impossible the process was prior to Apple devising this system. For me, it has literally made the difference between refusing to write anything on my iPhone longer than a few paragraphs, to doing absolutely all of my writing on my iPhone once I found the nifty word processor I'm now using. As long as you understand what the gestures do, you'll marvel at how intuitive, precise, and quick the text selection process is.

Changing What's on the Rotor

A lot of people absolutely love the rotor idea. I'm one of them, and my rotor has nearly every possible option on it. However, having too much on the rotor can be overwhelming for beginners. Thankfully, it is possible to change which tools are present in the rotor and decide the order that they're positioned. This lets you find an order and set of features that best suits your style, needs, and competence.

To customize the rotor, go into VoiceOver settings and then flick right until you come to Rotor. Double tap that button, and you'll be in the right place. Once there, You'll find a long

list of settings with buttons that can be either selected or not. Selected items will appear on the rotor. All others won't ever appear. To add or remove items from the rotor, you simply double tap a setting to select or deselect it.

That lets you easily remove unwanted items from the rotor, reducing clutter. However, that still may mean a large number of options to turn through to reach the one you want at a given moment. It certainly does in my own case. Thankfully, it is possible to change the order of options on the rotor. One flick to the right of each setting is a Reorder button. To use these buttons, find the one to the right of the option you want to move. Next, double tap and hold your finger on the screen after the second tap. You can then drag the button up or down to change the placement of the item on the rotor. As you drag your finger, you will be told what it moves above or below. There will also be a small auditory beep and tactile vibration. You will be told what you've moved above or below. Just take your time and move your finger slowly while you get the hang of this.

How to Do It: Selecting Braille Screen Input

Braille Screen Input, or BSI for short, lets you position your fingers on the screen as if they were on the keys of a Braille writer and enter Braille characters. This can be easier to master for people proficient in Braille than the standard

onscreen keyboard. What's more, if this option is moved to the very top of the rotor, you will find that BSI will activate automatically whenever an edit field is entered. This can save you many twists of the rotor if you want to use it whenever possible. To demonstrate how to select and change the order of items in the rotor, we will go through the steps of setting this up. If you don't want to actually use BSI, simply double tap the Braille Screen Input option until it doesn't say "selected".

Presuming you're already in the Rotor settings:

1. Flick to the right repeatedly until you come to Braille Screen Input.
2. Double tap on this button to enable this feature.
3. Flick once to the right, placing you on the Reorder button matching the Braille Screen Input feature.
4. Double tap quickly with one finger lower down on the screen. After the second tap, hold your finger down. Think of this like picking up a puzzle piece. As long as your finger remains on the screen, the choice will be attached to it as if your fingertip was magnetic.
5. Slowly slide your finger up towards the top of the screen. You will hear a small click sound and feel a short vibration each time you move your finger far enough to pass an option. You will also be told what you move above as your finger slides up the screen.
6. If you get to the top of the screen, lift your finger. You can then find the Reorder button for the Braille Screen Input option again and move it further up if necessary.
7. Make certain that the Braille Screen Input option is at the very top of the list of rotor settings. There's a heading at the very top of the list, so turning the rotor to Headings and flicking up will get you to the top quickly.
8. Flick right over the options. The very first one should now be Braille Screen Input. This completes the process. From now on, the Braille keyboard will activate whenever you need to type something. If you don't want to make use of the Braille keyboard during a particular occasion, you need only turn the rotor to another option such as Characters or Words. The traditional keyboard will then be available.

Now, you should be able to move options around at will, as well as determine which of them will be on your rotor.

Key Gestures

There are many gestures that you will use to control your iOS device. These gestures will involve from one to four fingers. If you find it easier, you can perform these with fingers from each hand. Sensors in the surface of your device will detect the differences between finger movements. With more modern devices beginning with iPhone 6S, this is taken even further with a concept called 3D Touch. Devices with this capability can sense how hard you press on a given app or option and act accordingly. Personally, I've found 3D Touch to be more trouble than it's worth and don't use it regularly. I'm apparently far from the only one to come to this conclusion. It appears that Apple plans to remove 3D Touch in future devices. If your device has this capability, you can enable and disable it in the Accessibility settings. Apple has made certain that 3D Touch will work in conjunction with VoiceOver, so you can certainly make use of it if you wish. Meanwhile, let us proceed with gestures specific to VoiceOver.

The Touch

The touch is the most basic of gestures. It is accomplished by touching the surface of your device with a single finger. This announces the item you happen to place your finger upon. The item will be read aloud but not activated. You can safely

touch all over the screen to your heart's content and develop a sense of where things are. This is true in all areas including inside apps you may be using.

The Tap

A tap is accomplished by quickly striking and then lifting one or more fingers from your device. There are taps using from one to four fingers involving up to four strikes in quick succession. When using VoiceOver, there is no single-finger tap. This is regarded as a touch. A single tap with two fingers will cause VoiceOver to pause or resume speech. Very handy during book reading and on plenty of other occasions. A three-finger tap will read an item summary or report status information such as your position within a document. Finally, tapping with four fingers near the top or bottom of the screen will quickly move your cursor to the top or bottom, respectively.

The Double Tap

This gesture comes in variations involving from one to four fingers. In all cases, the touchscreen is struck twice in quick succession. Presuming you haven't changed the Double Tap Timeout setting, the default speed is like what one might imagine the speed of a stereotypical heartbeat or quick knocks on a door would be. The single-finger double tap, simply called the double tap, is used to activate things. It lets VoiceOver know that you

intend to activate an item rather than simply find out what it is. Touching a button called Play would merely cause VoiceOver to inform you of the button's function. Performing a double tap on the button would cause it to activate, which would perhaps cause music to play. Double tapping on a button called OK would cause it to be pressed. Double tapping on a selected app on your home screens would cause the app to launch.

The Double Tap and Hold

This gesture involves a one-finger double tap, but after the second tap, don't lift your finger. Instead, keep it in position on the screen until a series of short rising clicks happen. This gives access to secondary menus or other hidden options available in different contexts.

The Two-Finger Double Tap

This variant of the double tap is sometimes called the "magic" tap. Its results will vary depending on the context in which it is used. Normally, it will cause the most recent app to have played audio to pause or resume playback. This is useful when busy in another app. Rather than having to switch into the app playing audio, pause it, and return to the email you didn't quite catch, you can quickly do a two-finger double tap pausing the audio, and then review whatever part of the email you didn't quite catch. Should you receive a phone call, the two-finger

double tap can be used to answer it, and then hang up when you're finished. It will also perform functions specified by app developers. For instance, the Twitter app uses this to give rapid access to tweet options such as reply and retweet, etc.

The Two-Finger Double Tap and Hold

This gesture involves making a two-finger double tap and then holding your fingers down after the second tap. Wait until a short tone sounds, and then lift your fingers off the screen. This puts you in a mode that makes it possible to label buttons and other improperly labelled parts of an app you want to use. This could make otherwise inaccessible apps become useable. If developers or sighted helpers inform blind people about what the element or button is supposed to be labeled as, this gesture lets you input those labels so the app is more accessible.

The Three-Finger Double Tap

This gesture will turn speech on or off. This is not the same as turning off VoiceOver. You may want to do this if you are making use of a Braille display. Braille is all handled through the VoiceOver feature, so if you prefer not to be interrupted by speech chattering away as you try to read lecture notes or a book in Braille, you should use this gesture to turn off speech. All VoiceOver gestures will still behave normally. Also, the small sounds VoiceOver uses to alert you to various

things will continue to function. Simply perform another three-finger double tap to cause VoiceOver to resume speaking. Turning VoiceOver off and then back on will automatically have it resume the default behaviour of speaking.

Entering Help Mode

VoiceOver contains a Practice mode that allows you to become accustomed to performing various gestures without causing unintended consequences. You can enter this mode by employing a four-finger double tap. With four fingers spaced apart in a manner allowing the tips of all to touch the screen at once, strike the screen twice rapidly. VoiceOver should announce "starting help" followed by instructions on how you can exit this mode. This is done by the exact same gesture used to enter it. As I explain various gestures, you can enter this mode and master them. Should you wish to control your device with a Braille display, Bluetooth keyboard, or some other method, this mode will be helpful in determining which buttons or keys on your hardware perform various functions. With a Bluetooth keyboard, use the VoiceOver key and the letter "k". The Escape key exits Help. On a Braille display, hold down the spacebar and hit the letter "k" to enter and exit Help.

The Triple Tap

Tapping quickly three times with one or more fingers is called a triple tap. The one-finger triple tap is used to access context menus. There are all sorts of context menus. Performing a triple tap on the Twiterrific app, I find options to compose a tweet, edit the home screen, and other options. One option you will always find first in a context menu is the Dismiss Context Menu option. This returns you to whatever was present prior to you invoking the context menu. Try this out in various places where you suspect there may be available contextual options.

One example of where this context menu access comes in handy is in the Ulysses app I used to write this guide. There are times when you want to search for all instances of a word or phrase and replace them with something different. I got into the habit of putting a hyphen between "double" and "tap". Later, I learned that they were written as completely separate words. I therefore had to change all the hyphens in "double-tap" to spaces. To do this, I invoked the Search function in Ulysses. I then entered "double" followed by the hyphen. Next, I moved to the Search button and flicked down on the rotor reaching Access Search Options. Double tapping this, I flicked right and double tapped on Replace. This brought up a second edit field where I could enter the replacement text. I then felt around the bottom

right of the screen to find the Replace button. On its own, it would replace one instance. I wanted to replace all instances. I therefore triple tapped on the Replace button invoking its context option. Flicking right, I found and double tapped on Replace All, and my task was complete. I just hope I remembered to do this in all of the sheets in the guide.

This is the sort of thing you'll want to check for in apps you use extensively. Over the years, I've developed a sense of where they might be found. The Replace All option in Ulysses was initially anything but obvious to me. However, Once I discovered it, I began exploring other apps mor thoroughly and found numerous options similarly situated. These tend to be options that are sometimes very useful but not always needed. App developers want them handy but don't want them cluttering up the ordinary activity displayed while an app is used. It's one of those conventions of iOS that can be less friendly to beginners who don't think to look for these extra options.

The Item Chooser

Tapping three times with two fingers will cause you to enter the Item Chooser. This is a useful mode when navigating apps with a lot on their screens. It sets out all of the interactive elements that you can then flick left and right through and examine, unhindered by the rest of what an app might

be displaying. Double tapping on an item will select it. To exit the Item Chooser without making a selection, simply press the Home button if your device has one, or implement the appropriate gesture sliding your finger from the bottom and lifting it after the first beep.

VoiceOver Settings

Having control over your screen reader and understanding all related options is of paramount importance. To aid this process, we will discuss all of the VoiceOver settings here rather than in the larger section devoted to what's in the Settings app. You can always refer to this section if you need to understand something about VoiceOver. The first thing you come to in these settings is an item that announces that VoiceOver is on. This is a toggle. If you double tap it, you will shut VoiceOver off. Should you do this accidentally, don't panic. Simply hold in the Home button until a beep is heard and say "turn on VoiceOver". This will cause Siri to turn on VoiceOver. Presuming you have set up the Accessibility Shortcut, you can also simply press the Home button or Action button three times rapidly if your device has no Home button. VoiceOver should turn on and announce this to you.

Flicking right from this toggle, you will find some text giving very brief instructions for how to use VoiceOver. To the

right of these lines of text, you will come to a button called Practice. This will take you to an area where you can practice different gestures. You can also get to this practice area from anywhere using a four-finger double tap. The subsection immediately preceding this one contains detailed descriptions of all important gestures. After reading about a particular gesture, you can go into the Practice mode, try it out, and then exit the Practice mode, returning back to this document presuming you are reading it on your iOS device.

Speaking Rate

Continuing to flick right from the Practice button, you will hear the first setting, which is Speaking Rate. This is actually a heading. Once you have mastered the rotor, turn it to Headings and flick up or down to quickly reach this heading. In this instance, it is the only heading on the screen. In other circumstances, it is a fast way to navigate websites and other documents. In this settings screen, it is handy to quickly reach the first setting past the on/off toggle and introductory text or to move upward from deep into the settings.

Flicking right once more, you will come to a slider. You can adjust this by flicking up or down to increase or decrease the speaking rate of VoiceOver.

Speech

This group of settings lets you take control of which voice is used by VoiceOver as well as other aspects of how it speaks. You can have one or more voices available on your device and add more than one language to your rotor. Each variant of English can have a slot on your Language rotor. You can then quickly switch between these differently accented voices without having to return to this section of Settings. To change the voice occupying a language slot, you will need to use this section. Voices take up space on your device, so you can remove ones you don't want.

Besides choosing which voices are available on your device and in your Language rotor, you can also change how certain words are pronounced. You do this through the Pronunciations button located in the Speech section. Once in the Pronunciations control, you'll find a list, presuming you've added entries before. Alternatively, you will simply find an Add button that brings you to where you can enter words or phrases and how you want them pronounced. These entries can be case sensitive or not as desired. They can also be only specific to a single app like a word processor, or voice specific if desired. There's a lot of room for flexibility here. Having grown up with synthetic speech, I don't make use of this feature. However, those who

have trouble understanding their voice of choice may find it very useful. This is especially true if you want names pronounced correctly. For the most part, I think VoiceOver does a good job far exceeding what I remember from school days.

Verbosity

The next setting is actually a button that opens a small subcategory of settings that control how verbose VoiceOver is. This functions exactly like the button in Accessibility settings that takes you to the VoiceOver settings we are now investigating. Think of it like a big tree with branches. The Verbosity settings are a branch extending from VoiceOver settings. Within this branch, you'll find a toggle setting for Hints. While you're still learning the ropes, you'll want these to be enabled or on. There is also a toggle having to do with emojis. VoiceOver can speak the word "emoji" to make certain you know that you have encountered these pictures meant to convey emotional content. If this setting is disabled, you would merely hear the image description of the emoji. You'll also find a setting indicating whether or not you want any detected text to be spoken. This can be handy if an item in focus isn't properly labelled. There might be text on pictures that would also be spoken if this feature is enabled. You can also control the amount of punctuation spoken. Finally, you can determine how you

want to handle any tables you might encounter. For now, that's all you'll find in this branch of VoiceOver settings. I wouldn't be surprised if more settings are eventually encapsulated in here, though. To back out of an area or branch of a tree of options like this Verbosity branch, touch the top left area of the screen to find the Back button. Double tap this with one finger, and you'll move back one level. You'll be doing this often and will soon find your finger remembers precisely where to touch so as to hit the Back button and not the status bar immediately above it.

Braille

These settings let you determine how VoiceOver handles Braille while using a Braille display paired to your iOS device. You will find a discussion of using Braille with VoiceOver as well as descriptions of all Braille-related settings in the section called Going Dotty a little farther along in this guide.

Audio

This small but important subsection of VoiceOver settings lets you control any sound-related aspects of VoiceOver's operation. Besides speech, VoiceOver contains sound cues to help blind people follow what's happening. You can turn these on and off here. Also, you can determine whether you want VoiceOver to speak through the left, right, or both channels. You can also do

the same for sound effects so that it's possible to have speech in one ear and sounds in the other if you wish. Another important setting in this cluster is Audio Ducking. When enabled, any other audio such as music that is playing will have its volume lowered whenever VoiceOver is speaking. This way, you can be certain to hear everything said by VoiceOver. Another potentially useful setting found here lets you automatically switch calls to speaker phone if you aren't holding your iPhone up to your ear.

A new addition as of iOS 13 is the tactile bumps felt as you use VoiceOver. This is called haptic feedback, and you'll find a Sounds & Haptics setting in the Audio branch of VoiceOver settings. You can choose which elements create bumps when interacted with, turning them on or off as desired. Also, you can choose the strength of the bumps that you feel. Of course, it's also possible to completely turn off this haptic feedback if you dislike it.

Commands

One of the most extensive and liberating additions for VoiceOver users in iOS 13 is the ability to fully customize the gestures and keystrokes that VoiceOver makes use of. This level of control was previously only available to users of Braille displays. However, it is now possible to assign and change any

of the default gestures or keyboard commands Apple has chosen into ones that better suit your ability and style of use. I won't go over each and every option here. Doing that could easily add fifty thousand words to this already large document, and there's really no need. An overview of this branch of settings and a few examples should give you enough to make your own changes.

This branch is divided into several sections. Each section has a button that brings you to it. The All Commands button lets you access the entire list. This list is also divided into areas of interest, each having its own button. Next, there are buttons to access all Touch Gestures and all Keyboard Shortcuts. This division is very useful for making changes to the interface you're using. However, I typically prefer going into the All Commands list.

Past these buttons, you'll also find buttons dealing with changing gestures used while using Braille Screen Input or while using Handwriting. Each of these special modes of input needs its own small set of gestures. These are treated differently while in these input modes.

At the end of the Commands branch, you'll find something very important. It's the button that lets you reset to the original set of commands. I'm ever so thankful this has been

added as it's easy to customize everything so much that other users won't have a clue how to help you. Unfortunately, there's currently no ability to save a configuration of customized commands. Should you need to use that reset option, all of the changes and customizations you've made will be lost.

While in one of these lists, you can edit the list, changing order of entries and even removing unwanted commands if desired. If you want to change an entry, double tap on it. You are then presented with a large list of options for the gesture or keyboard shortcut. The options are organized into sections under headings. This will let you quickly navigate to what you want a shortcut or gesture to do.

Changing the Rotor into Easy Swipes

Many people really struggle with the concept of turning the rotor. One way to make it easier is to change the feel of it entirely. Instead of a dial that turns and points at options, we can make it a menu that is swiped through with two fingers. Swiping left will get us to the previous rotor option and swiping right will get us to the next rotor option. It becomes a series of pulldown menus we can swipe through. Frankly, I think Apple may have been better off using these two finger left and right swipes we are about to set up. This does conflict with gestures used in Braille screen input. Let's get started.

To do this, we first need to find a suitable simple pair of complementary gestures that aren't already used. To do that, double tap on the Touch Gestures button. This presents you with a list of gestures starting with the single-finger tap and going all the way up through four-finger taps and swipes. You can flick right quickly through all of the taps and reach the Two-Finger Swipe Left gesture. Double tap on this, and you'll find a large list divided into headings. Turn the rotor to Headings, and flick down until you come to the Rotor heading. There, you'll find buttons for Previous and Next Rotor. Double tap on the Previous Rotor button. You'll be returned to the list of gestures. Flick left or right to find the Two-Finger Swipe Right gesture. Double tap on this, and then use the same method you did for finding the Previous Rotor command but select the Next Rotor option instead. Double tap this, and you've done it.

Now, you can swipe with two fingers left or right to cycle through the rotor options. As before, you still flick up or down with one finger to change a rotor option you are currently on or move by that increment through a website, document, or other text. This should feel a lot less strange for people who can't cope with turning an imaginary knob.

Sometimes, changes like this may conflict with other gestures. If you decide to use these two-finger swipes for your

rotor, it will conflict with gestures used for Braille Screen Input. If you don't plan to use this method of input, there's no worry. However, if you do plan to use Braille Screen Input or Handwriting, you may want to stick with the original rotor turns or find alternative gestures.

How to Easily Reach the Status Bar

Here's the problem. On devices without home buttons, the very top and bottom areas of the touchscreen are used to indicate you wish to reach special areas such as the home screens or app switcher, etc. It has therefore become much harder to find and use the status bar and avoid triggering the special condition that looks for those upward or downward slides. Sometimes, you just want to know how much battery charge your device has, whether you have cellular signal, or what the time is. I'm hopeful that over time, Apple will ease this difficulty. However, it's now quite easy for those of us who make use of the status bar to take proactive action.

What we need is a simple gesture that isn't already assigned to another function that will move us onto the status bar. Once there, it's still quite possible to flick left and right to go over the current contents. In the Commands branch of VoiceOver settings, find and double tap the Touch Gestures button. Next, set your rotor to Headings and flick down through

the various gestures until you find one that doesn't have an assigned function. I settled on the Four-Finger Single Tap. The Four-Finger Double Tap is already used to invoke the VoiceOver Help mode, which lets you practice and find out what gestures do. Using the Four-Finger Single Tap to reach the status bar seems like an easy gesture to remember and isn't already being used. On my iPhone XR, there's enough room to make invoking this gesture easy. On more narrow smaller devices, another gesture might prove more suitable.

Once I've found the Four-Finger Single Tap, I double tap on that heading. This takes me into a large list of functions that I can assign to this gesture. Set your rotor to Headings for speedy navigation between kinds of functions. I flicked down to the Basic Navigation heading, and then flicked right through the list of functions in that category. Eventually, I came to Move to Status Bar. I merely had to double tap on this to assign the function. Now, whenever I use a four-finger tap, I'm immediately transported to the status bar. This may not work in all circumstances. I've found that in Ulysses, my writing app of choice, I don't end up reaching the status bar and still need to find it by feel. However, the newly assigned gesture will work as expected in most circumstances.

Further Thoughts on VoiceOver Commands

These are two very basic examples. There are endless possibilities for useful customization here. Perhaps, you're used to a set of keyboard commands from a different screen reader and would like the keyboard commands for VoiceOver to be more like those commands. Perhaps, you find one or more of the gestures assigned by Apple to be less than ideal for your particular dexterity or hand coordination. Turning the rotor is a prime example of this. Now, you can sculpt the set of gestures or keyboard commands to be truly optimal for you. I hope the simple examples I've outlined above will be sufficient to drive you to explore this branch of VoiceOver settings and use what it offers. If worst comes to worst, remember that there's always that Command Reset button.

As you create or alter commands, keep symmetry in mind. In the example for previous and next rotor gestures, we used two-finger left and right swipes. Nothing prevents us from using a swipe to go one way and a tap to go another. However, doing this sort of thing can make it more likely that you'll forget commands. The choices Apple makes in the default set of commands have been carefully thought through to be logical, symmetrical, and consistent.

Don't worry about accidentally overriding the function of a gesture or keyboard shortcut. If you pick a gesture or shortcut that is already being used, a dialogue will pop up to warn you. At that point, you can either cancel the change or reassign the gesture or keyboard command to your newly chosen purpose. Absolutely nothing is written in stone.

Activities

In addition to the ability to customize gestures and keyboard commands discussed above, Apple has also added the ability to customize how VoiceOver behaves based on the app you're in or the kind of thing you're trying to do. These two capabilities transform VoiceOver from a "my way or the highway" screen reader into an experience that is as flexible as other screen readers have been since the beginning. Perhaps, you want a slower voice that doesn't speak out punctuation marks for use while reading a Kindle book. On the other hand, you want a faster voice that reads most or all punctuation marks when you're writing or proofreading a document. Until iOS 13, you would have had to adjust everything manually each time you wanted to make a change. Activities settings can now perform

these changes automatically or at your command through the ability to select Activities using the rotor.

The area where you manage and create Activities is just past the Commands setting. Double tap on Activities, and you'll be there. The first thing you'll find is an Edit button. This lets you rearrange and remove Activities you've created. After that, you'll find the Programming example Activity Apple has created. This will give you an idea of what ingredients go into an Activity. Past that, you'll find a very brief text explaining what Activities are. Last of all, there's the Add Activity button. As you create Activities, they'll be added to the list after the Edit button. You will also be able to select them using the Activities setting on the rotor.

When you double tap on the Add Activity button, you are presented with an Activity Creation dialogue. The first thing on it is a text field for you to choose a name for that Activity. It would be a good idea to name activities based on the specific app or situation you want them to be triggered with. I write a lot, so we'll create a group of settings ideal to my writing habits. I'll name the Activity "Writing". The first thing I come to is a heading called Speech Settings. I could choose a different voice but will leave it on the default setting. The speaking rate defaults to 50%, which is too slow for when I'm

writing. I'll set that to 65%. This takes some fiddling, since the slider moves by 10% increments. Dragging and sliding your finger can help with this as can double tapping on the slider, which changes its value by 2% at a time. The volume is fine where it is.

Verbosity settings come next. I like my Punctuation setting to "some" while writing. I don't use emojis, so that's set to "off". The same goes for table information. Using a physical keyboard, I need not worry about Braille Settings. Flicking down to the next heading, I find Automatic Switching, which will cause the activity to activate when the correct app or situation is encountered. This is a context-specific activity I want to create, so I'll double tap on Context. The very first Context option is Word Processing. I double tap on this, which selects it. I then need to use the Back button to leave the list of contexts and return to the Activity Creation dialogue.

The final part of the dialogue lets you select different modifier keys for indicating VoiceOver control rather than the default ones. I never use the caps lock while writing, so I choose not to change that. Having gone through the full dialogue, I touch the top left of the touchscreen to find the Back button. There is no Save button. I am returned to the main

ACTIVITIES dialogue and find that both the Programming and Writing activities are now present.

There are around seven or eight different contexts such as Narrative or Spreadsheet, etc. that can be chosen from. Presumably, any app you have installed can be added to the Automatic Switching list to trigger the Activity setting to come into effect. A very simple yet powerful tool for customizing how VoiceOver works in different situations. I wouldn't be surprised if the number of options and behaviour possibilities increases in the Activities setting over time.

Rotor Settings

These settings allow you to customize the order and contents of the VoiceOver rotor. Simply double tap on features to add or remove them. To rearrange them, tap and hold your finger down on the Reorder button next to the feature you want to move. Keeping your finger on the screen, slide it up or down. You'll hear a brief beep, and VoiceOver will tell you that you've moved the feature above or below others as you pass over them. That's all there is to this section, but it's enough to really make a big difference with your experience of the rotor.

Typing

The settings in this section let you adjust how VoiceOver interacts with the typing experience. There are a few different aspects to this that we'll examine below:

Typing Style

There are three typing styles or modes to choose from. The Default is called Standard Typing. In this mode, you can feel around and find the key you want to type in. Once you've found it, tap twice quickly on that spot. alternatively, you can hold your finger on that key while tapping anywhere else on the screen with another finger. This is called a split tap. I personally find this method to be slow and cumbersome. However, it makes as certain as possible that what gets entered is what you intend. This is especially safe and useful for beginners or people with hand mobility challenges. Don't worry about how long you hold down your finger on the key after you find it. You have all the time in the world.

The next mode is called Touch Typing. In this mode, you can feel around to find the right key, and then simply lift your finger off the screen to enter the keystroke. I prefer this method as it speeds up the typing process. Don't take too long raising your finger, though. Otherwise, you will find yourself entering an alternate symbol. These are less commonly used but

handy every once in a while. I find the time before alternates appear to be long enough, but beginners might feel a little rushed. Experiment with this typing mode in the Notes app where it's impossible to do anything too unexpected.

The last typing mode is called Direct Touch Typing. It basically lets you type unaffected by VoiceOver. Keystrokes are entered the instant a key is touched, so you had better know exactly where you put your finger. This mode is for those who are blessed with good hand coordination and muscle memory.

Phonetic Feedback

This lets you hear phonetic words used to represent entered characters like you hear over radio transmissions. For instance, "Alpha" for "A", "Bravo" for "B", "Charlie" for "C", etc. You can choose to hear only the phonetic words or have the normal characters spoken followed immediately by the phonetic word. This might be useful in noisy environments when it would be easy to miss hearing just the typed character spoken. Choices here are Off, Character and Phonetics, or Phonetics Only.

Typing Feedback

This setting lets you choose what kind of feedback you want while typing. You can choose between Nothing, Characters, Words, or both Characters and Words. This last mode means you'll hear each typed character spoken as well as the whole word when a

space, return, or punctuation mark is inserted. These choices are the same for all software keyboards found on the screen of your device, with a separate set of these choices for physical hardware keyboards. Right now, I'm typing this on a mechanical keyboard I recently acquired for use while at home. It provides excellent tactile feedback. As I've come to trust that keystrokes are being properly registered, I've switched to no typing feedback while I'm using it. Meanwhile, for typing on my iPhone's screen, I prefer to hear characters I type spoken so that I know they're correct before proceeding to the next character.

Modifier Keys

This setting lets you choose which keys are used to indicate that you want to control VoiceOver rather than type something while using a physical keyboard. The Caps Lock key is my preferred modifier key. You can also use the Control and Option keys held down together. Nothing stops you from having both options selected.

Keyboard Interaction Time

This determines how long after you may continue to hold down a key before VoiceOver determines that you wish to access the Slide to Type feature or alternative options. The default delay is one second. Beginners who don't often make use of

alternative options may wish to increase this to two or more seconds so that they aren't rushed while learning how to proficiently type on the touchscreen.

Always Speak Notifications

This setting tells VoiceOver whether you always want to hear new Notifications when they appear. This is the default behaviour. If you would rather not be informed, you can set this to off, and check the Notification Center for any updates when it's convenient to you. This might be preferred when reading a book or working, for instance. You can have Notifications generate sounds that are unique to a given app. This can be a good compromise as you'll know from the sound that an update is available from a specific app without your workflow or reading being interrupted.

Navigate Images

This setting lets VoiceOver move between images on a website. You can set it to only move to images with descriptive alt text and ignore ones without this information. Alternatively, you can have VoiceOver register all images regardless of whether they're described. Finally, you could elect to have VoiceOver ignore all imagery in websites, skipping over them silently. Depending on what you're doing, all of these modes can be useful options to have.

Large Cursor

This cursor outlines whatever options are being spoken by VoiceOver. This makes no difference to totally blind people but may be helpful to people with low vision or to sighted people trying to understand how VoiceOver works.

Caption Panel

At times, it can be useful for sighted people to see what VoiceOver is speaking and when things are spoken. This can be useful when figuring out how to fix issues with VoiceOver and to give sighted people a better sense of how VoiceOver works with apps and in various situations. This panel can either be on or off.

Double Tap Timeout

This last setting allows you to specify the amount of time during which a second tap will count as a double tap. This can be extremely helpful for people who can't move their fingers quickly and accurately enough to consistently achieve a double tap when they wish. You can set the number of milliseconds that works for you. There are buttons to increase and decrease the time. If you find that you're registering double taps when you don't intend to, try shortening this timeframe and see if that helps.

VoiceOver Key Commands

Rather than having all of the many key commands in this guide, I'll direct those who are interested to Apple's accessibility page at www.apple.com/accessibility. Go to the Vision page and then to Explore Options for Blind and Low Vision. There, you will find a section called Support, where you can get the full user guide for your product in tagged HTML, Apple Books, or even downloadable Braille. This will also make certain that you're getting the most up-to-date list possible.

Make use of these commands via the modifier key or keys you choose in VoiceOver settings. I prefer using the Caps Lock key as my modifier, but you may also use the Control plus Option key combination. Those keys are at the very bottom of the keyboard, and that works better for some people. In the following list, I'll refer to these modifiers as VO. You hold down that modifier key or keys, and then also press whatever additional key or keys will invoke the command. For example, to enter VoiceOver Help, press VO plus the letter "k". That is, hold down the Caps Lock key or the Control and Option keys, and while holding that down, hit the letter "k". To get people started off, here are some important basic key commands:

Enter VoiceOver Help — Press VO plus letter k.

Exit Help and/or return to previous screens — Press Escape key.

Go to home screens — Press VO plus letter h.

Move to status bar — Press VO plus letter m.

Turn rotor left or right — Press VO plus Command plus Left or Right Arrow.

Flick up or down on rotor — Press VO plus Command plus Up or Down Arrow.

Open Notification Center — Press VO plus FN and Up Arrow.

Open Control Center — Press VO plus FN plus Down Arrow.

Open Item Chooser — Press VO plus letter i.

One-finger double tap — Press VO plus Spacebar.

Two-finger double tap — Press VO plus Hyphen or Dash.

Swipe up or down — Press VO plus Up or Down Arrow.

Quick Nav Mode

For physical keyboard users, Apple has devised a mode called Quick Nav that lets you do a whole lot of navigating web pages or other things using letters and arrow keys. To activate or deactivate this mode, press VO plus both the Left and Right Arrow keys. While in this mode, you can use the left and right arrows to quickly reach the next or previous element in an app. Use the up and down arrows to move to the next or previous item specified by the rotor. Use letters like "h" and "t" to reach the next heading or table within a website. To move backwards by these amounts, simply use the same letter while holding down the Shift key. It's a really fast and simple way to move around. Just remember to turn off Quick Nav mode when you need to type in fields or edit documents. Be certain to look through Apple's user guide, as there are numerous commands in this mode.

Keyboard Versus Touchscreen Gestures

There are commands to do absolutely everything with a physical keyboard. I've just given you enough here to get started. Make use of the VoiceOver keyboard help and look through Apple's user guide to learn about all of the commands and get optimum use of your device and keyboard combined.

Nothing says you need to choose between one or the other. I tend to use my keyboard mainly for typing, and simply reach over with one hand to my iPhone while working at my desk to use gestures. For me, that's far more intuitive and efficient than memorizing all of the key commands. If you do a lot of work while travelling, you might find that it's worth learning all of these commands so that you can operate your device while only needing your keyboard to be on your lap while in a vehicle. Your iOS device can be safely packed out of sight while turned on. This can be particularly convenient with wireless Bluetooth headsets or AirPods.

Compared to some other screen readers, there are less commands to learn about. Also, Apple has kept things consistent in terms of groups of commands. Once you've learned enough of them, intuiting others gets easier.

Focus Issues

There are some occasions where VoiceOver will lose focus on what you're attempting to read or interact with. Some interface elements are trickier than others. A good example is popup menus and dialogues. When I want to share something, I double tap on the Share button. This causes the Share Sheet to appear. This pops up over the app currently in focus to offer a range of options. These include people and apps you may want to send what you're sharing to. There are occasions where this dialogue won't close when you hit the Close button. To extricate yourself from circumstances like this, feel around the screen until VoiceOver says Dismiss Popup Window. At this point, perform a one-finger double tap, and the annoying popup window will disappear.

Other times, an app's design might prove unusual enough to give VoiceOver trouble. You may find that when you try to do something such as read text in a field, VoiceOver seems to start but cuts off sharply, moving instead to a button or somewhere else in the app. This may be a problem specific to that app. However, it could also be an issue with VoiceOver. It never hurts to inform app developers or the Apple Accessibility Department about such problems. Remember that VoiceOver is constantly evolving as new graphical designs and interface options are made available for app developers to use. Some of

these are designed by app developers rather than Apple, so VoiceOver won't always work as well with them. Screen readers are complex things. Most of this complexity happens behind the scenes between the apps we use and the screen reader that tries to keep us informed. Often, app developers will be able to fix problems occurring in their apps. However, sometimes, problems will be more widespread and be the result of bugs in the VoiceOver screen reader. In such cases, developers must typically wait for Apple to release an iOS update where improvements to VoiceOver can be made available.

VoiceOver Conclusions

VoiceOver has come a very long way in ten years. Back when I got my iPhone 4, VoiceOver had only been around for perhaps a year or so. Even then, I remember how delightful everything was once I had mastered the basics. Apps and websites have gotten more complex as time has passed. VoiceOver has also improved drastically over the same span of time. However, these improvements don't ever seem to make the experience of using VoiceOver feel complicated. It still feels just as natural to me now as it did back then. The overall concepts and methods of interface have held up tremendously well. At this point, VoiceOver has really matured to where an iPhone or iPad can be nearly as easy to master and more comprehensive in the

capabilities it offers than any product designed specifically for blind people.

More than most screen readers, VoiceOver bridges the gap and shapes our experience of what it gives us access to. If you can understand the concepts I've gone over in this section, then you've managed to make the largest leap into radical territory necessary to get maximum benefit from your iOS device. Once you've mastered VoiceOver enough to competently use a touchscreen, the rest is just a matter of understanding apps, how they're laid out, and their capabilities. It's a good idea to take time getting a feel for how VoiceOver works and figuring out which settings will work best for you. This is the groundwork upon which all else builds.

iOS 13 has brought a bunch of new capabilities that have propelled VoiceOver forward by leaps and bounds. In addition to the Commands and Activities settings, there is also the increased ability to describe pictures and images. This can help make formerly inaccessible apps useable, even if not as elegant as the experience can be when developers actually put effort into polishing accessibility. While Apple provides the accessibility tools, it's up to individual app developers how much they use them, presuming they decide to at all. This can make a huge difference. for instance, the game Six Ages makes

extensive use of the VoiceOver Hints system to deliver important game information to the player in a convenient way. This makes for a far more enjoyable experience. Adding special hints, image descriptions, and alternative interface elements like custom rotor options can turn an app from accessible but impractical to being outright delightful to use for blind people. Another obvious example is deciding what gets spoken automatically. Too much can be just as annoying as not enough. The user needs to take a bit more of a proactive role when it comes to exploring the screen and actively looking for things like buttons or elements. It's a tradeoff between efficiency and awareness, which lets many apps be far more accessible and practical to use than they otherwise would be.

Keep in mind that when all of this was initially conceived, there was no app store filled with hundreds of thousands of apps. VoiceOver has grown in capability in similar fashion to how iOS has expanded over the years. Thanks to Apple's control of VoiceOver's development, you can be certain that any app that comes pre-installed on your iOS device will have been made by Apple and will work with VoiceOver. Apple does a lot to encourage third-party developers to make their apps accessible; however, nothing really forces them to. Don't be surprised if you end up getting an app that simply won't work with VoiceOver.

Some apps are simply too visual to be made accessible. In other cases, developers simply aren't aware of blind users. Once they decide to make their apps accessible, Apple provides ample resources that help them put VoiceOver to maximum good use.

There's still a lot of room for growth with VoiceOver. I think the biggest bang for buck will come from increasing awareness about it among app developers and the wider public. The overall user experience hinges just as much on efforts of people working outside the walls of Apple as it does on Apple's own considerable efforts to offer the best possible accessibility tools. I consider it very unfortunate that Apple has yet to create any kind of VoiceOver tutorial that comes included with iOS. Far too many blind owners of iOS devices who I've spoken with over the years simply didn't know about often very basic capabilities of VoiceOver. A tutorial or user guide that people were made aware of right from their first experience would go a long way to help the situation. I've felt compelled to write this guide to address this. As more blind owners become aware of what is possible, I hope we see an increased willingness to explore and try new apps. I also hope blind people who find themselves frustrated that an app is inaccessible will take the time to contact the developer and express their interest in the app were it to become more

accessible. If enough people take this step, many developers will take the time to improve the accessibility of their apps, leading to better experiences for everyone.

Through VoiceOver, Apple has welcomed blind people into their space. As paying customers, I believe people have every right to complain about accessibility issues with apps and with VoiceOver itself. Through polite and constructive criticism, I believe we have a tremendous opportunity to make a great deal of positive change.

The iOS Operating System: The Core of Your Apple Experience

When I upgraded to the Microsoft Windows operating system, I had to stop and learn quite a bit about its main interface and components before doing anything else. Just to be able to shut my system off, find my files, and run programs, I needed to know about the desktop, start menu, and more. This change happened during my time at university, and I really felt that halt in normal activities. Thankfully, there was a way to keep using the software I was used to in MS-DOS such as WordPerfect 5.1. I could tackle assignments while learning the new Windows ways of doing everything.

For blind people, the whole notion of learning to use a touchscreen is a much larger intuitive leap than the one from DOS to Windows. It is a leap into the utterly unfamiliar. It is such a different way of doing things than anything I had used before. However, the iOS operating system does so much in the background that you don't have the same need to go through the same kind of learning process. I simply began using my iPhone. Once I had mastered some basic gestures, I was able to plunge right in and start getting things done. Long after I was making and answering calls, creating reminders, playing games, and listening to music, I could learn about the bulk of iOS at my

leisure when the need arose. It was more important to master commonly used gestures and where to find things on the screen. While you're figuring out what you need to, iOS is taking care of you much like a co-pilot on an aircraft. That's why the section on VoiceOver comes before this one in the guide. It seems counterintuitive to learn about the screen reader first. However, the more you explore your device, the more this order of doing things will make sense. Don't worry if you don't grasp everything right away. What I hope to give you is a better overall sense of iOS than I had when I started.

The iOS operating system is the software that runs your iPhone or iPad. It operates in the background as you accomplish things on your iOS device. It is largely invisible to the user, keeping everything running smoothly and containing features you might not think of as part of an operating system. For example, the VoiceOver screen reader is a part of iOS. So are many other accessibility tools. A lot of the more visible aspects of iOS are presented as apps that are discussed in their own sections. That's a major reason why this section is so much shorter than you might have expected it to be. A good example of this is the Settings app that lets you configure your device. The app store and Music app are two more examples of this kind of thing. As a user, they seem like discrete parts. However, behind the scenes,

app developers can tie elements together to create apps that tap into these various capabilities in concert as needed. The same goes for all the accessibility features we will discuss in this book. You'll actually spend a great deal of time learning about aspects of the iOS operating system. It just won't feel that way, since its presence takes so many different forms.

Recently, a new fork of the iOS operating system was created. Called iPadOS, it will be used to specifically run iPads from this point onward. The size advantages of iPads make different things possible on their larger screens. Enough differences in layout and use have emerged to make the developers at Apple believe that over time, things will differ more sharply between how one uses an iPhone or iPod versus an iPad. This split has just occurred recently. The largest difference I noticed was that apps could now be substantially smaller on each platform. I really struggled to make headway with the iPad, and there may very well be other aspects of the change that completely escaped me.

iOS does a whole lot of things completely behind the scenes to give a smooth and intuitive user experience. Examples include managing power consumption, encrypting and decrypting information on the fly, monitoring your device's temperature, checking for new information, and interpreting finger movements

on the touchscreen known as gestures. These include such things as taps involving one or more fingers, swipes, and flicks, etc. These may seem strange at first but will eventually become very intuitive as you do more with your device. iOS controls all the other hardware in your device such as memory, audio input and output, reading sensors, and other functions. It also makes certain that files are kept organized and are kept with the apps that use them. You need never worry about where a given file is if you don't want to. This greatly simplifies things especially for more casual, less tech-savvy users. However, when you want to take more personal charge of aspects like this, iOS provides the tools you need.

Though much of iOS is hidden, it presents users with facilities for interaction with our devices. It is primarily designed for people with sight. The touchscreen displays many icons that represent apps or actions that users may take. Below, I'll take you on a tour of the major elements you'll be interacting with. Some things like the Settings app will be discussed in their own sections. iOS has a number of standard conventions that this section will familiarize you with. Once those are mastered, things will feel quite intuitive. We'll start all of this with a brief discussion of what is meant by "apps".

What Apps Are

Like other operating systems, iOS comes with many programs and functions built in. Other developers create pieces of software that build on parts of the iOS operating system to create more capabilities. Apps or "applications are these programs that allow you to perform tasks on your device. They do everything from play your music to letting you send and receive email. I'm using an app called Ulysses to write this guide. It is a word processing app made especially for authors of long documents like this one. At the same time I'm writing this section, another app called Naturespace fills my ears with the sound of wind blowing through an aspen forest, waves on a beech, or any of dozens of other natural soundscapes. I often add modern instrumental music to this with the Music app from Apple. I'm especially fond of piano pieces while writing. Beyond the apps that come with iOS, people have made hundreds of thousands of additional apps. You can obtain these from the app store, which we'll discuss later on in this guide. There are many apps developed especially for blind people. Others have been made accessible when developers were made aware of blind users. You would do yourself a grave disservice if you failed to avail yourself of at least some apps beyond what comes on your device.

For this section, however, we'll stick mainly to what comes pre-installed.

Apple has produced a number of free apps that either come pre-installed with iOS or may be freely obtained from the app store if people want them. The apps that come pre-installed offer a good range of basic starting capabilities for your device. If you have an iPhone, it will have a Phone app that gives you all of the functions you'd expect from an actual phone. Other apps include a calendar, calculator, reminders list, a notetaking app, the music app, a web browser called Safari, and many more. If a kind of technology is present in your device, you'll find an app letting you make use of it. The Maps app, for instance, gives you a robust set of navigation abilities making use of the GPS receiver and other location-finding capabilities in your device.

Feel free to explore and try out these apps you find on your device without worrying that you'll cause any harm. You can't do any damage to your device by this kind of exploration. When you want more capabilities than are currently found on your iOS device, you will want to make use of the App Store app. That's where to go to find apps to do an astonishing array of things. The app store is a very important piece of iOS that warrants its own section later in this guide.

Interface Elements

Much like the desktop and taskbar in Windows, iOS presents its users with some constantly available screen elements. These are present no matter what device you use and which orientation you have your device in. While inside an app or folder, these elements may be hidden from view. However, you will always be able to reach them by exiting the app or via special commands.

The Status Bar

At the very top of your screen, you'll find a thin strip of indicators known as the status bar. Some apps will hide this when they're being used but touching anywhere on the top of the screen may result in the focus being put in the status bar. There are numerous indicators. Exactly which ones you'll find depends on the capabilities of your device. Flicking left or right will travel over the indicators and read them out. At the very left of my iPhone's status bar is a signal strength indicator showing one to four bars depending on how good my connection to the cellular network is. The indicator to the immediate right informs me that it is an LTE network. Farther right, there is a WiFi strength indicator showing one to three bars. The three bars it currently displays tell me that my current connection is the best possible. To the right of that, there is a clock. Past that, the battery charge indicator can be

found at the right end of the line. At times, other indicators can appear. One might specify whether your device's orientation is locked, meaning that the positions of items on the screen will stay the same if you rotate your device. Another might inform you that your location is being tracked by an app. Don't worry if you don't know some of these terms. All will be revealed in due time.

That status bar also serves as a gateway to a couple of important areas of iOS normally hidden from view; namely, the Control Center and Notification Center. Both of these areas are described later in this section.

How to Do It

To get to the Control or the Notification Center, do the following:

1. Touch anywhere on the status bar with one finger and then lift it.
2. Next, use three fingers to make a swiping motion on the screen upward for the Control Center or downward for the Notification Center.
3. To exit either area of iOS and return to the app you were in or the home screens, push the Home button.

More recent models of iPad and iPhone don't have home buttons. They also have thinner status bars. To compensate for this, VoiceOver users can do the following to reach various places:

How to Reach the Control and Notification Centers

1. Put your finger right at the top of the screen. You should hear a short beep and feel a very brief vibration.
2. Move your finger downward until you feel a second vibration. Release your finger at that point to reach the Control Center.
3. Keep moving your finger downward until you hear a third and higher-pitched beep. You will feel a quick vibration. Lift your finger at that point to be taken to the Notification Center.

How to Reach the Home Screens and App Switcher

1. Place your finger at the very bottom of the screen. You should hear a short beep and feel a brief vibration.
2. Move your finger upward slowly until you feel a second vibration and hear a short beep. Release your finger at that point to reach the home screens.
3. Continue moving your finger upwards until a third vibration and higher-pitched beep are encountered. Lift your finger off the screen at that point to be taken to the App Switcher.

The Home Screens and the Dock

Below the status bar, you'll find a page full of icons representing apps. When you first get your device, there will be a couple of pages containing apps that come shipped with iOS. Later on, you may obtain so many apps that you will want to put them into folders. For now, though, each name you flick to or touch will be an app. Double tapping on a selected app will activate it and give it focus. You can double tap on an app after reading its name or feel around to find an app you're interested in and then while holding your exploring finger down, tap anywhere on the screen with another finger. Either method works and results in the same thing.

Once you go into an app, it takes the space below the status bar for itself, because it is "in focus". Right now, the Ulysses app I'm writing this on is what's in focus. To get to other apps, I would need to make use of the Home button on an older device or the equivalent gesture on the iPhone XR that I'm using. However, I can still touch the status bar. This lets me check such things as the time, battery level, and connectivity without actually leaving the app I'm working in.

Your home screen contains one or more pages of all apps present on your device. You can swipe left and right with three fingers to move between pages of apps. There is no limit on the number of pages of apps you can have on your iOS device. Double tapping on an app icon will open it, making it the app in focus. If you don't know what a double tap or swipe is, see the previous section on VoiceOver where such gestures as these are explained in detail.

How to Move Between Home Screen Pages Without Swiping

Are you trapped on a single page of your apps? If you haven't mastered the three-finger swipe, there's another way to get around. It's called a "slider". It can be found one flick beyond the last app on the page just before you get to the dock. Touching near the bottom right corner of the screen often gets

you there. For a more reliable way to reach it, do the following:

1. Touch the middle of the bottom of your screen. This will put you on a row of apps called "the dock". We'll discuss the dock below these instructions.
2. Flick left with one finger. You will likely hear the name of an app such as Safari, Phone, or Settings. Prior to the name of the app, you'll hear VoiceOver say "dock", which indicates that you're in the dock.
3. Flick left over any apps until you hear VoiceOver say, for example, "page 2 (of however many pages there are)". This changes as you acquire more apps. VoiceOver will also give you a hint about what to do here on the page slider.
4. Flick up or down with one finger while on this slider to transition between pages of apps. You can also use this to reach page 1, which is called the Today view. More on that later.

The Dock

Another special area at the bottom of the screen deserves brief explanation. It is called the Dock. Depending on the size of your device, this area contains four or more slots for apps you want to keep handy at all times. Apps can be moved in and out of the dock as desired. The size of your dock cannot be adjusted. As you acquire more apps, they will fill more pages on your home screen. Your home screen only has room for a certain number of apps, so that's why they are divided into pages of apps or put in folders containing apps that fit between your status bar and the dock at the bottom. If you find that you frequently want to make use of a particular app such as the Safari browser or the Phone app, stick it in the dock so that it's always handy.

The Today View

From your first page of apps, swipe right with three fingers. Presuming you're using iOS 10 or later, this will take you to what VoiceOver counts as page 1. It is a special page called the Today view. This is an area that has been designed to give you a kind of overview of information that is important to you in one place. The idea is that you can quickly look through this screen much like the front page of your own personal newspaper and find out any important information. You are able to customize what information is kept updated in the Today view as well as the order in which it is presented.

Things are divided by heading so you can quickly move between blocks of information delivered by the widgets different apps make available. What is a widget? Essentially, widgets are extensions of apps that can be added to your Today view page. This serves as both an entry point into the app and a place where potentially important information from it can be displayed. This quite often eliminates the need to go into the full app. The contents will change as you acquire and use more apps. Not all apps have been equipped with accompanying widgets. If you download apps that have widgets, you will notice an item at the bottom of your Today view that informs you that new widgets are available. Once you have gone into the edit area

where you can add, remove, and reorder widgets, those new widgets will be highlighted and labelled as new.

Once you've mastered the use of the rotor gesture, you can turn the rotor to Headings and flick up and down to quickly move through the Today view to information of interest. For now, move through the options by flicking left or right with a finger. You can double tap on a button to activate it and flick up or down with one finger to access other options when told that actions are available.

Information displayed by each widget can often be configured to your liking through related settings. These will either be found right in the specific app in question or else in the main Settings app discussed in a later section of this guide. These widgets will almost always offer more functionality than simply displaying content or proceeding into the full app they represent. You may, for instance, be able to reply to a message, open a particular news story, or return to your current place in a book you were reading recently, etc. While it isn't essential to make any use whatsoever of the Today view, it can be an effective and convenient summary of activity and information important to your daily life.

How to Edit Widgets in the Today View

If you scroll down to the very bottom of your Today view using three-finger upward swipes, you will also find an Edit button that lets you enter a mode where you can reorder, insert, and remove widgets from your Today view. This mode consists of two areas. The first thing you encounter is a list of widgets already present in your Today view. Beside each widget name is a Reorder button. If you feel competent enough, you can double tap and hold your finger down on any of these Reorder buttons and then drag your finger up or down the screen, thereby moving the widget. You will be told which widgets you're moving above or below. Alternatively, if you don't want to use this method, you can simply touch the name of a widget and then flick down until you hear the "move up" or "move down" options. Double tap the desired option, and the selected widget will move one spot in the ordered list.

Below this list of currently included widgets, you'll find a heading called More Widgets. Past this heading, you'll find a list of available widgets with Insert buttons beside them. Simply double tap on an Insert button to add the widget to your Today view. Widgets will always be added at the bottom of the ordered list. To remove a widget, simply go to its name in the ordered list and then flick down until you hear "remove". Double

tap this, and the widget will move to the More Widgets list and disappear from the Today view.

Widget Wisdom

When organizing your own Today view, I think you'll find it best to put the information you are most likely to need at the top. In my case, that means the Battery widget takes top spot. In addition to the battery level of your iOS device, that widget also shows the battery levels of any accessories you're using that report that information to iOS. This includes my AirPods, Bluetooth keyboard, and possibly other accessories I might need. There's no other place in iOS where all of that information is readily available. That's easily the most frequently checked item on my Today view. Rather than making better use of the Today view, I habitually go into the full app, which contains the information I want most of the time.

The Today view really shines when you need a quick update of what's going on. Widgets don't display very in-depth information even when they are set to "show more" rather than "less". I think in terms of quick information or utility delivered from the top down. There comes a point where it would just be quicker to simply open the full app containing information. As a result, I don't have anywhere near all of the widgets that I could have included in my Today view. I have

hundreds of apps and a good many of them offer their own widgets. At least three dictionary apps offer such things as the "word of the day". PCalc, my calculator of choice, offers a widget allowing for quick calculations right from your Today view. However, I would just as soon be in the full app if I needed its mathematical help; therefore, I choose not to use that widget. The same holds true for the various reference widgets from dictionary and thesaurus apps and the Wikipedia app. If I'm going to put those resources to use, I find it just as convenient to go into the full app.

Below the Battery widget, I have the Fantastical widget. This will show me any upcoming events as well as any reminders with approaching due dates. Because many of my reminders don't have due dates, the Reminders widget is right beneath the Fantastical widget. Below that, I have the Notes app widget, which displays the last active note and lets me reach the full app quickly if desired. The next widget down is Files, which displays the files I most recently added or acted upon in some way.

At this point, I have the Weather and News widgets to give brief constantly updated information of current conditions and events. While the Weather widget is set to "show less", I find the News widget shows too little in that mode to be at all

useful, so it is set to "show more". This completes my personal Today view. It's quickly navigated and concise.

The Control Center

The Control Center may be accessed by first touching the status bar. It doesn't matter which icon you touch. After you do this, swipe upwards with three fingers. Alternatively, you can get there by the following method:

1. Touch the top of the screen with one finger and listen for a short beep.
2. Keeping your finger on the screen, move slowly downward until a higher pitched beep is heard. Release your finger at that point.

The device should then announce "Control Center" followed by the control currently in focus. This will most likely be Airplane mode, which should normally be off. The Control Center contains a number of sliders and buttons that let you change some of the settings on your iOS device. These are settings that people are likely to want to change often. These settings are simple in nature, and typically have on/off states such as for Airplane mode, Bluetooth, or WiFi. Double tapping on these will toggle them on and off as desired. Turning WiFi and Bluetooth off when these capabilities are not needed can make your battery last longer. The Airplane mode button turns off all external communications from your phone, making certain that it doesn't send signals that might interfere with flight operations. It can be handy if you want to make very certain you aren't disturbed

by incoming information. However, in most situations, setting the Do Not Disturb mode to "on" with the button in the Control Center will be preferable, since information can still be sent and unobtrusively received by your device.

The Orientation Lock bears special mention. It locks how icons are oriented in either landscape or portrait mode. I typically have my iPhone locked in Portrait mode so that things are arranged with the status bar by the camera and speaker and the dock is above my Lightning port. Landscape mode is useful for people who want longer distance left to right. For example, you may want this orientation when editing documents to have more of the lines visible at once. Regardless of the orientation lock settings, some apps will require you to operate them in landscape mode. For sighted users, this makes a very big difference depending on what they are viewing.

Other settings have sliders that can be controlled with up or downward flicks. These settings include the Brightness and Volume controls. You'll notice three buttons that are different from these two kinds of settings controls. These buttons let you access the Clock, Calculator, and Camera apps. Should you be playing music or other audio such as podcasts, you'll also find Previous, Pause, and Next buttons in the Control Center. It's all very immediate and simple. To leave the Control Center,

press the Home button if your device has one. If not, use the appropriate gesture to return to your home screen.

As of iOS 12, you can highly customize what is found in the Control Center. You can also choose whether it can be accessed on the lock screen or while within apps. Depending on your preferences for security versus convenience, this can prove useful. You take these actions in the Settings app in the Control Center section, which is found next to the General section. Adding, removing, and reordering controls is very similar to how editing widgets worked, so I'll leave this for you to figure out at your leisure.

The Notification Center

The Notification Center is a little more complex than the Control Center. Information from many apps on your phone will be recorded in this center where it awaits your convenience. Too busy talking on the phone to deal with a message? Check the Notification Center after you've finished the conversation, and you'll find it there. Results of actions that occur in the background while you're focused on something else will also appear in the Notification Center.

After touching the status bar, swipe downward with three fingers to open the Center. Alternatively, you can follow exactly the same procedure used to reach the Control Center, the

only difference being that you keep moving your finger down further until a third high-pitched beep is heard. Release your finger at that point and you'll reach the Notification Center. Once there, touch your finger near the top left of the screen and flick right. In order from most current to older notifications, you can flick right through what is available. Double tapping on a notification will open the app that generated it and put you there. Flicking up or down on a given notification may yield more options, allowing for even more efficient action. This depends on how well an app has been integrated with the Notification Center. Available options depend on the app in question. An example of what's possible is following someone who has followed you on Twitter. It is a very useful area for blind people, as it serves as a catch-all for information that might have been missed while you were busy doing something else.

Notifications may be grouped and organized to suit your preferences. For instance, all notifications generated by social media apps like Twitter can be grouped so they don't clutter up everything else. You can then expand that group when you want to look at all of the notifications. Alternatively, you can delete all of them at once as a group. Flicking down on a group of notifications brings you to options, including one that lets you

manage the group. Double tapping on this lets you determine how notifications from a given app are to be treated. My favourite use for this is to have notifications from certain apps delivered quietly so they don't disturb my work but are still made available in the Notification Center when I feel like checking it. It can make a big difference in feeling that your device is at your command rather than you at its.

Notifications can also be organized in different orders and managed in the Settings app in the Notifications section found just to the left of Sounds & Haptics. In there, each app that can generate notifications has a style choice button beside its name. You can choose among several options depending on how intrusive you want the notifications to actually be. They can generate sounds or appear as banners that speak and then disappear. Alternatively, they can appear as alerts, forcing you to deal with them or dismiss them before doing anything else. As another alternative, they can simply be added to your Notification Center and not interrupt you at all. You are given quite a lot of latitude here, so explore and choose what seems best given your unique situation.

Moving and Managing Apps

When I first moved into my current apartment, it didn't really feel like a home. Much of the furniture was new to me. so

were all of the appliances the apartment came equipped with. I had to get used to where everything was and figure out where I wanted my various possessions. Remembering what went where took some time. Eventually though, all of that became second nature. Gradually, normal life started happening in my apartment. I had guests over, worked on creative projects, and volunteered in the community. One day, it struck me that this place no longer felt like somewhere I was passing through. It felt like my home.

In a very real sense, your iOS device is a kind of digital home. It is a place where your digital life can happen and grow. Your home screens and the apps you choose to acquire are your appliances, entertainments, decorations, and working tools. I realize that most people reading this guide will be newcomers to the iOS ecosystem. You more than likely haven't even begun to explore the app store for items of interest. However, it seems sensible to include some remarks on organization of apps here so that as your collection increases, you'll have an idea of why doing so can be well worth the time spent. If nothing else, you might find that it helps your iOS device feel more like it actually belongs to you and in your life. That can help decrease any feelings of trepidation you may have about your new device.

Sooner or later, you'll want to put the apps you have into an order more suitable to your needs. Doing this is much like

solving a puzzle with the apps being pieces. For blind people, solving this puzzle used to be an excruciating process of careful touches, finger pinches and being ever so careful. Earlier, I mentioned that double tapping on an app will cause it to open. This is the normal state of affairs. However, there is an Edit mode that changes this. Instead of activating, apps become inactive puzzle pieces that can be picked up, put down, tucked away into folders, or removed completely. You can enter this edit mode in two ways. Simply double tap and hold your finger on an app until you're informed that Edit mode has been activated. Alternatively, flick up or down after touching an app and double tap when you hear VoiceOver say Edit mode.

If you're in this Edit mode, double tapping on an app will delete it. You will be asked if you're certain you want to delete the app, so don't worry about accidentally deleting an app. Touching an app will highlight it. This is also called "selecting" an app. Once an app has been selected, it can be used as a marker for where you want to place apps you're currently dragging. Otherwise, flick up or downward and you'll go through a series of options that can be performed with a double tap. These change to fit current circumstance and include adding the app to those being dragged, dropping apps you're

dragging before or after the selected app, adding apps being dragged into the contents of a folder, etc.

How to Move Apps

Once in the Edit mode discussed above:

1. Touch the app you want to move. You can also flick left and right to select the desired app.
2. Once the correct app is selected, flick down to reach the Drag or Add to Drag option. A series of three rising clicks will happen to indicate that the app has been picked up and is being dragged.
3. If you wish to add more apps at once, you can freely scroll with three-finger swipes between pages if necessary to find the apps you want to add to the bucket. You can simply double tap on them, and the default behaviour will be to add them to the drag in progress. Remember to pick them up in the order you want them, or you'll have to rearrange them later.
4. Now that you've picked up one or more apps, it's time to head to where you want to put them. Again, you can scroll around even between pages to reach the desired location. Once you're on the right page, touch or flick to any app. Flick up or down through the menu of options, which will include dropping the carried app or apps before or after the destination app. You will also find an option to make a folder with the dragged apps plus the destination app. A name will automatically be given to the newly created folder based on the nature of the apps involved. However, you can rename this folder once it has been created. Simply double tap on the option you desire, and it will be done.
5. If you wish, you can use this method within folders to organize apps. For instance, moving favourite apps to the top of the folder to be more quickly accessed.
6. To exit this editing mode, press the Home button to return to normal operation. Your device should say "finished editing". For devices without a Home button, simply use the appropriate gesture to reach the home screen. Alternatively, you may wait 30 seconds for the edit session to time out, returning you automatically to your home screen. There is also a Done button found after the last app on any page while in editing mode.

Let us assume that you've elected not to simply leave apps where they are placed by default. There are a number of alternatives. One approach is having all apps be in alphabetical order. There is a way to accomplish this for apps other than the ones on page 2, which is your first home screen. Just keep in mind that when you acquire any new apps, you'll need to manually

put them in their correct place, since nothing maintains the alphabetical order. There's no way to just tell iOS that you'd like all future apps put in alphabetical order. One problem with this method is that apps you might use for related things might be numerous home screens apart from each other. You might, for instance, need to scroll through a number of home screens after opening the Audible App to hear a lecture to reach and open the app you'll use to take notes on that lecture. The more apps you get, the more home screens you eventually need to swipe through. However, if you don't have very many apps or find that knowing where everything is comes more naturally if they're ordered alphabetically, that peace of mind may prove worth the drawbacks. If you wish to use this method of organization, here's how:

How to Put Apps in Alphabetical Order

Rather than have apps be in folders, some people would simply like all apps to be in alphabetical order. There is a roundabout way to accomplish this. Be warned though. This method will destroy any folders you've previously created. After you complete the following steps, you'll find that your home screen has been reset to how it was initially. Any apps beyond the ones present on that screen will be arranged in alphabetical order.

This can save a lot of time dragging and dropping apps. To proceed, do the following:

1. Double tap the Settings app.
2. Flick right with one finger until you find General. Double tap on the General button.
3. Touch near the bottom right of the screen. You want to find the Reset button. If you don't land right on it, flick left or right until you encounter it. Double tap this button.
4. Flick through the options until you come to Reset Home Screen Layout. Double tap on this.
5. Flick right and you'll hear an explanation of what this option will do. Flick right again and you'll find a Reset button. Double tap this and your home screen layout will be reset. All apps that aren't part of what was originally on your home screen will be arranged in alphabetical order.

The Allure and Frustration of Folders

A far more common approach to keeping one's apps tidy is to place them all in category folders. This way, you eliminate the need to scroll through home screens. In pretty much any imaginable circumstance, all folders you need to create will fit on page 2, which is your first home screen. If necessary, additional categories would appear on subsequent home screens. You might have a folder for apps you use for work. Another would contain apps used for navigating. Another would have any games you chose to acquire, and so on. These descriptively named folders make it very intuitive to know where to look for whatever you might want or need. One is left with a very grownup, business-like utilitarian first impression. Within those folders, apps can be left where they appear with none the wiser, unless they go snooping on you. For increased efficiency,

you can arrange apps in your folders so that the ones most often used are at the top.

I've found that using folders has a couple of annoying drawbacks. One of these is that while a folder is open, you can't get at the status bar or dock until the folder is closed either by entering an app or exiting the folder via the Home button or equivalent gesture. You also introduce the extra step of opening the folder you need before getting at the desired app. As you gain more apps, this will quite possibly be worth it for you, as you'll be spared multiple swipes to reach the right home screen. You may still need to swipe between pages within a folder, but chances are that you'll need fewer swipes to get where you need to be. This is especially true if you take the time to keep the apps within your folders optimally arranged.

Folders are very easy to create. You simply drag one app that you'd like to be inside a folder and instead of choosing to drop the app before or after the other, choose the Create Folder option. This results in a folder being created with two apps being placed inside. Once this has been done, the folder may be entered via a double tap. While inside a folder, double tap and hold on an app to enter Edit mode. You will then be able to rename the folder if you wish as well as move apps around or eject them from the folder. When folders open or close,

VoiceOver will emit a brief rising or falling sliding sound cue. It will also announce "folder opening or closing" if Hints are enabled.

My Easy Path to Relaxed Organization

As you might imagine, I've tried pretty much all of the alternative approaches iOS makes available over the past eight years. The last thing I want to spend much time doing is keeping apps organized. Convenience will always trump neatness in my book. This isn't a pricy decoration. It's a tremendously useful tool of life. From quite early on, I had an abundance of apps. It didn't take long for me to realize that leaving them where they were placed wasn't going to cut it. I determined that having my apps alphabetically arranged just wasn't going to suit me at all. It felt painfully rigid and inflexible. It took years for Apple to come up with a less painful way of moving one's apps around. Once moving files became enjoyable and not a form of torture, I gave folders a good crack. While it certainly felt spiffy having everything essentially fit on my default home screen, there were things I grumbled about. Having to open a folder before doing anything felt very clunky and restrictive to me. I got into the habit of keeping a whole lot of apps open and running just so I wouldn't have to go into their folders. My app switcher was very long and unwieldy. Once apps were open, I

could use the app switcher to switch between them. This helped, but only a little, when it took many flicks to get to the one I wanted. Over time, more of the apps I used most frequently or wanted speedily available began to come out of their folders and onto first one, then two, and then more pages before I eventually gave up on folders entirely for a while. I have since softened my stance on folders and currently maintain two of them. They have their place in my digital home but only a small one. There are some categories of apps that you eventually collect in such abundance that it just makes sense to essentially stuff them into the equivalent of a special collector's cabinet.

Over time, one develops a muscle memory of precisely where to touch to find a given app. Even soon after you settle on an arrangement of apps, you'll begin to be able to touch very close to where an app you want is, and then merely flick left or right to land VoiceOver right on it. Eventually, the process becomes an almost subconscious thing you don't really even think about. The advantage of mainly using the numbered home pages rather than folders is that as I gather more apps, I can simply drop them on the page range in which they belong. No need to maintain folders or specific order beyond keeping the most important apps

on the first page of a given range. Everything can simply expand as necessary with a minimum of fuss.

Data Storage: Stashing and Stowing Your Digital Stuff

The whole concept of what a smartphone could be used for has changed drastically since 2011 when I got my first iPhone. At the time, 16 gigabytes seemed like plenty of space. Apps were small. Personal data didn't require much room either. Audiobooks and music were the only major storage hogs in the foreseeable future. The five gigs of iCloud space were more than I needed for several years. As a result, it was most of a year of using my iPhone quite heavily before I really had to learn about managing storage space. Everything had just kept on working so nicely. There eventually came a point where I had filled the capacity of my iPhone with music, apps, and books, etc. An update was available, but I didn't have enough room to install it unless I deleted something. It was time I looked into where everything was and how to manage it.

It helps to have a historical perspective. Until fairly recently, Apple didn't give you much detail on where all your data was. The iOS operating system was originally designed to run iPhones. These were conceived of as a combination cellphone and iPod with some added communications capability such as managing email. Keeping things simple for the user was of

absolutely paramount importance to Apple. Originally, there wasn't going to be an app store. Apple was going to develop all of the apps for the iPhone. It was only after over a year of iPhones existing that this whole principle of containment changed, and an app store was created. It had arrived perhaps a year before I got my iPhone 4. Developers were still in the process of figuring out what was possible and what users were willing to pay for. However, even by that point, things were starting to change. People wanted to use external files that weren't part of Apple's ecosystem and needed to have things organized.

Currently, iPhones and iPads are beginning to replace traditional computers for people. They contain chips powerful enough to give entertainment experiences equivalent to what dedicated game consoles are capable of providing. There are apps for things that go far beyond anything Apple could have imagined when they created iOS. There has never been any sort of complete rewrite of iOS from scratch. However, the file storage software and technology has gone through at least one major recalibration, which resulted in far greater efficiency. However, the interface used to manage your data has been built continuously upon what has come before as the need arose. We will explore this edifice as it now stands roughly in the order

of construction. This way, when things seem a little clunky, you'll at least have a handle on why that is. Keep in mind that Apple is very carefully walking down a path of increased openness from a very closed and restrictive starting point.

Solid-State Drives

Each iOS device comes equipped with a built-in solid-state drive. You choose its capacity at the time of purchase from a limited number of options. This constitutes the fixed amount of your device's internal storage. You cannot change this amount once you have purchased your device. The available capacity options have increased in size over the years as people have begun using these devices more as portable computers rather than consumer entertainment devices. Solid-state drives are very speedy and durable. However, they are still somewhat expensive in terms of storage capacity relative to hard drives. The underlying assumption of these devices is that you can keep what you really need to stored ready for use in the solid-state drive whether you're online or disconnected. The rest of what you might need on occasion can be stored safely in Apple's iCloud service or other online repositories where items can be retrieved when needed. This works quite well as long as you're connected to WiFi or have cellular service available. Such connectivity through WiFi or cellular data is becoming

inexpensive and ubiquitous enough to make this quite workable for a growing number of people. Libraries, restaurants, and other public places are increasingly offering free or low-cost WiFi. Also, special cellular data plans and Internet packages are being offered for people with low incomes.

Data is stored on your device in such a way that you don't really have to deal with folders or picking areas to store things. Everything has its place and each app knows precisely where its data is. Anything you download must be associated with an app that will make use of it. You can't just stick stuff in the digital equivalent of a bin like you could with a Windows PC. Apps that let you create or use files would have facilities within them to let you manage or sort them. for instance, the Audible app has a library of books you've downloaded onto your device. You are able to sort these books, search for the one you want, and delete books individually from your device when you no longer want them taking up space. If you need them again, you can always download the book onto your device again. The same goes for any files like books or music that you obtain from Apple's services. Everything has its proper place.

If you need to go beyond file management within individual apps, the iPhone Storage section of settings is where you should go. This is found in the General subsection of Settings. Here,

you are able to gain an overall picture of what you actually have on your device. Information is stored categorically with each app being its own category. There are also areas for music, photos, mail, contacts, and more kinds of data not tied to a single app. Nothing is left just lying around unattached to anything.

Each app title or category of data is named. As you flick right or left through the apps and categories, you'll hear the name read out as well as the amount of storage being used. Double tap on a name to go inside its section. Flick right to go through the possible options, double tapping on one if you want to implement it. Currently, you are able to delete an app along with its data if you no longer want it. You are also able to delete the app but leave its data on your device. This can be good if an app takes up a lot of space but the data doesn't. The icon for the deleted app will still remain on your home screen. Double tapping it would download the app back onto your device where the data still resides. It would then be ready to use. If you delete an app as well as its data, you may still always download the app from the app store and begin using it as if you had just obtained the app for the first time. Keep in mind that any data that app used that wasn't stored on your device or in iCloud will still be available. For instance, if you delete the

Audible app, you don't lose your ability to access all of your books. You can reinstall the app, enter your login information and access your library of audiobooks.

For larger categories like photos or music, you are able to go into them by double tapping their name and then flicking right through what resides on your device. For instance, you are able to delete albums and songs from music individually rather than getting rid of every single song on your device. This is only possible for offerings from Apple services. You cannot pick and choose which Audible or Kindle books are deleted from within the iPhone Storage area of Settings. That data is treated as one inseparable amount connected firmly to its parent app.

When managing storage, you will typically do so from within apps themselves. For example, over time, one's music library can become very large. As of mid May of 2018, mine currently comprises over 18 gigabytes of a total 128 gigabytes I have available on my iPhone 7. This music can be managed best from within the Music app. You can easily remove albums, artists, and songs from your device but keep them in your library to be retrieved when desired. I wouldn't even venture to guess how many gigabytes all of the music I've added to my personal online library would take up. Very likely, it would exceed 50 gigabytes. I would never want that much on my device at a time.

Rather, I like to have a small subset of that downloaded and ready on my device.

The iCloud

The iCloud is an online repository of data where you are given space to store information. If you wish, you can pay for additional storage space above what is initially allocated. Each owner of an Apple ID starts with a minimum of 5 gigabytes of iCloud space. If you accidentally delete something or something catastrophic happens to your device, you can restore things like contacts, books, and other data that has been stored in your iCloud space. This space is tied to your Apple ID and password rather than to a specific device. When my father broke his original iPad, the photo he took just prior to its fall was transmitted to his iCloud space. When Apple gave him a new iPad, he recovered it and other information from iCloud.

Everything you purchase from the app store, iTunes, or iBooks can be deleted and redownloaded as often as you wish provided you're able to access the Internet via WiFi or cellular data. This isn't counted against your personal iCloud space. Only personal documents, data from apps you choose, and other personal data like photos count against your space and are actually stored in iCloud. My 10 gigabytes of music purchased from iTunes is not stored in the iCloud. Instead, a record is

kept of each song I purchased. I can pair down the songs stored on my iPhone to my current absolute favourites if I find I need more space for other things on my iPhone. However, I have chosen to allow my library of books from an app called Voice Dream Reader to be stored there. Often, as with the Voice Dream Reader app, settings found within the app allow you to control where things related to it are stored. Should something happen to my iPhone, I will be able to restore that library of books I've purchased onto my new iPhone without difficulty. It should happen automatically when I upgrade to a new iPhone. If I wish, I can also sync this library with any other iOS devices I may have the Voice Dream Reader app running on.

The primary use of iCloud is for backing up the important personal contents of your device. By default, information is backed up over night when your device is plugged in, connected to WiFi, and the screen is locked. In theory, this won't incur any surprise data charges or inconvenience the average user in any way. The presumptions are that your device will be left plugged in over night and that the screen will be locked. If this isn't the case as can happen while travelling or when unconnected to WiFi, backups will not occur automatically until the next time the above ideal circumstances are met. It is possible to force a backup to occur even when on cellular data

or when you have WiFi connectivity available. I do this regularly since my iPhone isn't plugged in overnight. It is also possible to exercise control over what applications have their data included in these backups and may make use of your iCloud storage. You can do all of this from inside the Settings app. Inside Settings, double tap on the first section you come to after the search field. Most likely, it will have your name presuming you own the device. Once inside this section, make your way to the iCloud button and double tap this. You are now in the iCloud area where you exercise control over this aspect of storage.

Flicking right through all of the options may seem daunting. However, there's really nothing overly complicated here. You will see the amount of storage you have in the Cloud. Next to this is a Manage iCloud Storage button. This can be used to pay for additional storage or downgrade should your needs change over time. You can also delete the contents that apps store in the Cloud as well as backups you may no longer need. Just be aware that this can't be undone so be careful here. If instead of hitting the Manage iCloud Storage button, you choose to flick right, you will find a heading called Apps Using iCloud and a long list of toggle buttons. Double tapping these changes their state between on and off. An on position indicates that

the app will use iCloud to store data. An off means that this won't occur, and any data present will be removed from the Cloud. Be careful with these toggles. If it doesn't say "button" after the name and status, it's a toggle and one double tap will change its state. Make certain you want to take the action before double tapping these. As you acquire more apps, this list will grow longer as each app that can make use of the Cloud will have its own toggle.

How to Manually Initiate An iCloud Backup

To force an iCloud backup to occur at the time of your own choosing:

1. Go into Settings and into the section called Apple ID, iCloud, iTunes & App Store. It is found directly after the Search field. Most likely, it will have your name as part of its label. Flick right until you come to a button called iCloud and double tap this.
2. Flick right until you come to the list of apps using iCloud. Flick right until you reach the iCloud Backup button and double tap this.
3. Flick right until you reach a button called Backup Now and double tap this. The process will now begin, and you must wait until it has finished. Flick left and right over the area to check on how the backup is progressing.

The iCloud Drive and Files App

As more apps were developed that dealt with different kinds of files, Apple introduced the iCloud Drive. This allowed apps or users to create folders where files could be stored in the Cloud. These files weren't simply part of regular compressed backups. Rather, apps could make use of these files, grabbing them from the iCloud Drive as needed. Files could also be copied

or downloaded to the iCloud Drive if users desired allowing for a much more versatile use of the portion of one's iCloud storage space not needed for backups. This makes it far more attractive for users to pay for extra storage space. The most frequently used files would also be stored on the user's iOS device so that they would be more rapidly responsive when used. There in fact used to be an iCloud Drive app to help manage this content. It has now been superseded by the Files app introduced in iOS 11.

iOS and Android have been on opposite journeys of discovery and change. Android started out as open as possible and has learned over time that this comes at various costs in efficiency and security. Meanwhile, Apple wanted a closed system, custom designed to work with its own hardware and software. The total control this gave them would let them create the best and safest user experience possible. And then real life happened, proving that neither path was in fact ideal. By the time iOS 11 was being created, things were changing in terms of how people wanted to use their iPhones and iPads. People were less satisfied with the more restricted compartmentalized nature of how files were stored and what files could be used. App developers were making apps that let people make use of their devices to do increasingly more things, and devices were becoming more viable more portable alternatives to traditional

laptops. Apple needed to open up what could be done without utterly wrecking their highly valued security.

The Files app eliminates a lot of the annoyances people had with how things were done before. The iCloud service is far more useful, thanks to the Files app letting people create folders and organize files.

The Files app acts much like the "Explorer" function in Windows. It allows you to create folders, organize and tag files, and copy, move, and share them. As of iOS 13, it can now compress and decompress files into zipped archives. This formerly required a third-party app to accomplish.

The main view is divided up into level one locations. Level one means that these locations are like branches on a tree trunk. The higher the level number, the farther out on branches you are. It is possible to create folders within folders. The level one locations are pretty self-explanatory such as On My iPhone, iCloud Drive, Favorites, Tags, etc. You can also incorporate third-party Cloud services such as Dropbox into this series of locations. Once this has been done, files can be moved from one Cloud to another or onto your iOS device to be put to use.

The Files app allows for quick viewing of some file types. However, to do much with any file, it must be on your device and

you should have whatever app that can act on the file installed on your device. Most often, you would use the Share action on a file to open a file into an app that can make use of it.

Alternatively, When you're in an app like Voice Dream Reader and want to retrieve a file from the Cloud, it will open an instance of the Files app, allowing you to browse and retrieve files that you then double tap on to open in Voice Dream Reader. After you're finished, hitting the Done button that appears near the top left will close that instance of the Files browser, and you'll be back in the app you were using.

Files App Layout

The layout of this app is very simple. At the top, there is an Edit button and a Search field. The Edit button puts you in a mode where you can activate or deactivate locations accessed by the Files app. For instance, you might use the Dropbox service and want to access those files using the Files app. Each location has a toggle you can turn from on to off. Also, it is possible to reorder the locations to better fit your needs. There is a Done button at the top for when you're finished editing.

You will find Expanded or Collapsed buttons for Locations, Favorites, and Tags. Below these at the very bottom of the app screen are two tabs. These are Recent and Browse. Most likely,

you will be in the Browse tab. The Recent tab confines itself to recently used files. The rotor is your friend here, letting you move quickly up or down to the start of the Favorites and Tags areas, since these are also headings as well as buttons. Double tapping on these will cause those lists to expand or collapse. This is handy as you jump over whatever is contained in that section. For instance, you may have a large number of Favorite items. Flicking down to the next heading would quickly get you to Tags. Once at the correct heading, double tap on it to expand or collapse the contents.

Double tapping moves your focus into a location. For example, double tapping on iCloud Drive moves the focus so that the files and folders on the iCloud Drive are displayed. At the top left corner, you'll find a Back button that moves you back onto the initial screen of locations. Double tapping on a folder name will move focus into that folder. Flick right to go through the contents of a folder. Remember that if you move onto a filename, the rotor will turn to the Actions setting, as the rotor helps you do things to files.

To the right of the Search field near the top, you'll find a New Folder button that lets you create a folder. You will also find Sort and View options. I have my files sorted by date and in list view. There is also a Select button that lets you select

files or folders for mass operations. Once files or folders have been selected, other options will appear near the bottom right, letting you Move, Delete, Copy, etc.

Tags

Tags are a kind of alternative to folders. You might want to tag a number of files with the Home or Work tag. Double tapping on a tag will show you any files marked with the tag no matter where they are. Apple has provided a number of tags including different colour names as well as Work and Home tags. You can add more if you wish. After that, one of the actions available when you're on a file is to tag it.

Once a file is tagged, going down to the Tags area and double tapping on that tag will focus on a list of files that have that tag attached to them. It won't matter which folder they're stored in. They'll all appear in that list. You might, therefore, have everything from documents to spreadsheets tagged as Work, and they'd all appear when you double tapped on the Work tag.

Adding and Removing Level One Locations

The Edit button discussed earlier lets you enter a mode where it is possible to act on those level one locations. You will find switches letting you turn things like iCloud Drive or Dropbox on or off. There is also a button for adding other

third-party Cloud services. When required, you will be asked for any credentials needed to allow access to third-party Cloud services. You can also access other storage media such as flash drives, SD cards, or external servers provided you have any adaptors or other hardware required. You should then, in theory, be able to deal with all available files within the Files app itself. Each storage source is treated like another level one folder.

Interacting with Individual Files

Once you've flicked onto a file you want to move or do something else with, the rotor will have turned itself to Actions. You then need to flick up or down to go through all of the available Actions and double tap on the one you want. You may find even more Actions available if you perform a one-finger triple tap on a file. Let's say you have a recording of a lecture. You don't need it right away but should keep it around for study before tests or exams. You downloaded the MP3 containing the lecture to the Files app. You will find it on the iCloud Drive in the root directory. Perhaps, you have created a folder on the iCloud Drive to store such files in the future and want to move this file into the Lectures folder. Flick right through the list of what's in your root iCloud Drive folder until you come to the lecture file. The rotor will have set

itself to Actions. Therefore, flick down or upwards through the available Actions until you come to Drag. In this case, it's quicker to flick upwards to reach it. Double tap on the Drag option to pick up the lecture file. Next, flick left through the list until you come to the lectures folder you created. Flicking upwards will prove faster to reach the Drop onto Item option. Double tap this to add the file to your folder. If you have set Sorting to Manual, you will be able to drop files and folders in whatever order you wish.

The HomeKit: Interacting With Smart Appliances in Your Home

The HomeKit acts as a control console and hub for smart appliances. For instance, you might have a smart thermostat allowing you to precisely and easily control the temperature. Smart lighting can be checked and turned on or off using your iOS device. This could be useful to blind people who often forget, as we occasionally do, to check that lights that aren't needed have been turned off. Such control can be absolutely vital for people with physical disabilities and dramatically increase their sense of independence. I certainly wouldn't object to a stove or laundry machines that allowed such accessible monitoring and control.

A brief look at a site that popped up when I double tapped on a button called Learn About Home Accessories, I was presented

with a wide range of "smart" devices. Everything from lights to doorbells to locks to air purifiers. The range is enormous now and growing constantly.

There are two tabs in the Home app. The first is called Home. This tab lets you control appliances in your "home" or other "homes" where you've been given permission to. Presumably where appliances are present and detectable, you will be able to interface with them.

The other tab is called Automations and allows you to set up sequences of events that can happen automatically or at your command. for instance, perhaps, you want the door to unlock, the curtains to open, and the lights to turn on when you arrive home. This sort of thing is quite possible and, from what I've heard, accessible and easy using the Home app and compatible accessories.

In a one-bedroom apartment such as ours, these sorts of things would perhaps be possible, but seem quite unnecessary. I can get up and walk the few steps over to the light switch and use it. Marking the stove with tactile bumps might not be quite as precise but works well enough for us. Perhaps, over time, smart appliances will become so standard that we'll find them being put in rental apartments. If that's the case, everything I've heard suggests that once your iOS device has been paired

with them, it shouldn't be too hard at all to control the appliances using Siri, or the controls within apps related to the appliances, or controls in the Home app itself.

The Grand Design

Overall, iOS has been designed to make things as efficient, safe, and simple as possible while using a touchscreen. This philosophy and flexibility extends to how you manage your data storage space to when and how alerts and notifications are displayed. Things are very intuitive for people who can see. Blind people need to piece together an overall sense of layout as they feel their way around what was designed to be taken in at a glance. Once you've learned the basic conventions of where things are, that intuitive sense will really start to kick in as you explore more apps.

A lot of options are compartmented inside various apps. A staggering amount of your ability to configure how an iOS device behaves is found within the Settings app. I have devoted an entire section of this guide to help you make the most of this important operational centre. Generally, though, there is information about aspects of iOS scattered throughout this guide. From the way dialogues and interface elements appear to how external devices like Bluetooth speakers are controlled, iOS is integral to it all. Its presence is felt in how apps work and

how settings can change their behaviour. It is felt in how you can adjust settings to suit your particular abilities and needs, open an app, and have these settings simply work. For instance, apps that support the Large Type accessibility feature will simply enact it if it has been set to "on" by the user. Once Audio Description is set to "on", apps such as Apple TV or Netflix will often simply play the audio description track if it's available.

For purposes of simplicity, this guide presumes that you are running iOS 13 or later. Each new version of iOS incorporates changes that affect how you accomplish things or what is actually possible to do. This is a fairly iterative and gradual process, so most of this guide will still be relevant for people using earlier versions or versions up to 14 or 15. Keep in mind, however, that drastic changes often occur in small areas improving upon ease of accomplishment or capability. Should you be using a device running an earlier or later version, be aware that, occasionally, information I cover or methods of doing things simply won't apply to your situation. Many apps won't work unless you update to a more recent version of iOS. There are also occasions where apps will be unavailable for later versions of iOS, because developers don't keep them updated. Despite the potential for this, I strongly recommend

upgrading to a more modern iOS version whenever possible. If your device can no longer receive iOS updates, I would strongly encourage you to upgrade to a more modern iOS device that can receive updates. Barring very unusual circumstances, the benefits of such updates far outweigh any losses. For the most part, app developers give their users some notice before stopping support for their apps. However, nothing mandates this.

In general, Apple makes certain that each new version supports older devices from at least four or five generations back. Recently, they put quite a bit of work into extending the longevity of older iOS devices. Now that Apple has incorporated public testing and is likely to correct major issues prior to the release of an update, it will be safer to grab a new iOS update as soon as you can. However, it won't hurt to wait and see if people on AppleVis or other forums discussing accessibility issues find any problems. These updates are always free of charge other than any data charges you might incur for downloading the update.

Even for people who don't require accessibility features, it hasn't always proved a safe assumption that things will work better than before with each new update to iOS. iOS 13 sadly provides a perfect example of this, which I fervently hope we'll never see the like of again. In a nutshell, when a blind user of

VoiceOver ended a call or audio chat, he or she was quite likely to suddenly find that VoiceOver had stopped working. No sound would come out of their devices, leaving them basically helpless. It isn't hard to think of situations where this could lead to serious trouble or even danger particularly for inexperienced users with no sighted help ready to hand. This is far from a minor annoyance to be fixed a few weeks later when it's convenient. People who spend money on these devices pay a premium for the care and attention to detail Apple has become known for. They shouldn't have to worry that answering a simple phone call would likely render their device absolutely useless to them unless they know how to recover VoiceOver functionality. Unfortunately, this kind of thing continues to make its way into public circulation.

Naturally, I wondered whether testers had reported this to the Apple Accessibility Department as the urgent major problem that it was. I happened to participate in a talk about iOS 13 for blind people along with a blind tester and asked about this. Apparently, this problem never manifested itself during the extensive developer and public testing cycle. They hadn't encountered it and so never reported it. Clearly, then, something changed between when the testing stopped and when the final public release emerged. We aren't dealing with a conscious

decision to ignore or devalue the experiences of blind users. Rather, we're dealing with a process that is so very complex as to defy understanding where the left hand doesn't always know what the right is doing.

Let's face it. Had a similar sort of bug caused the iPhones of sighted users to freeze up and go pitch black upon the end of a phone call, the problem would likely never have gotten out the door. Apple would have fixed the issue prior to releasing the version of iOS to the public. At worst, it would have been fixed extremely quickly, perhaps a week later at the longest.

Thankfully, this bug has long since been fixed by the time you read these words. However, it remained unresolved for over two months, during which time at least five quickly released updates appeared that fixed other non-accessibility related problems. Of course, each of those releases came with the dashed hope of such serious accessibility problems being addressed. The problems that the earlier releases fixed were either deemed more urgent and widely troublesome, or, far more likely in my opinion, simply proved easier to reliably replicate and/or remedy, making finding how to fix them easier. Thankfully, as of iOS 13.3 that appeared in early December of 2019, we've arrived where we should have been before iOS 13 was released to the public at all. It's by no means perfect, but it's at a point

where I would feel safe recommending that even new users update to iOS 13 rather than sticking with the latest update to iOS 12. Needing accessibility features to make good use of an iOS device unfortunately seems to notably increase the risk that an iOS update could actually prove detrimental to your experience. This risk is highest with a major release and drops with subsequent releases as more bugs are dealt with.

Given the rough entry of iOS 13, Apple has again taken steps to try to prevent such lapses in software quality in future releases. More safety checks have been incorporated to make certain that changes made in one area don't break things in another. This should lessen the chances of major problems slipping past both internal and public testing prior to new versions being released. Given the maturity of the hardware and the longer times people are keeping their devices, I believe things will improve in terms of not having catastrophic bugs emerge to frustrate people who didn't sign up for dealing with such surprises. Providers of the content offered by Apple's increasing number of subscription services will demand greater stability, and all the focus won't be concentrated on the latest hardware. It will increasingly simply be a delivery vehicle for the services, which will become the star attractions.

Over time, Apple has started with a very closed ecosystem and slowly begun to open sections up to third-party developers. This has resulted in increased safety and simplicity at the cost of overall choice. One key advantage is that accessibility tools are built into the operating system. If developers choose to make their apps accessible, they do not have to contend with as many variable circumstances as developers for the Android operating system. There are many apps that are accessible quite by accident, because they use standard controls and interface elements created by Apple. Apple takes many steps to strongly encourage developers to make their apps accessible to blind people as well as those with other disabilities. This includes building tools like VoiceOver into their operating system, offering workshops and documentation to teach developers about accessibility options, and much more.

I hope this gives you a good grasp of iOS and lets you explore your iOS device with a healthy degree of confidence. Presuming you've read the previous section that covered VoiceOver, you should now be able to begin taking charge of your device, making choices about how it behaves without any fear. Subsequent sections will be there to help you branch out from what comes preinstalled on your device and truly enter the online world in comfort and your own style.

What's in My Pocket: A Tour of My Portable Haven and Workshop

Where might it all go? With so many choices in the iOS ecosystem, some of you might be curious to learn what currently resides on my iPhone after ten years of having an Apple ID. I thought it might be helpful for newcomers to have a sense of the choices I've made in terms of apps. I'll also describe how my most important apps are arranged on my home screens. Those who have no interest may safely jump to the next first-level heading. I hope this serves to satisfy curiosity and encourages you to explore beyond the apps that Apple provides. Those are great apps to start out with. However, third parties have often come up with solutions and combined capabilities that can add tremendous value to your iOS device.

Keep in mind that the discoveries and choices I've made were as much a product of what was available when I needed various capabilities. A whole lot has happened over the last decade as the current configuration of apps on my iPhone gradually came into being. Don't feel like you need to grab everything I mention here. Think about what you want to do and find out about apps you're considering. What you end up with will doubtless differ substantially from what I have. My iPhone has many apps that don't get used, since other apps have proved

more suitable and capable. Other apps were obtained not so much because I needed them, as because I wanted to see how accessible they were. I've always had a fascination with the road not taken. In the iOS ecosystem, finding out what an alternative app is like won't break the bank. My collection of apps is somewhat large compared to what I would theorize most of my readers would end up with. nevertheless, this should give you a good idea of the kinds of possibilities that iOS offers. Without further delay, lets get started.

Welcome to my humble digital abode. Come in and make yourself comfortable. Hang your coat on the status bar at the top. Before we begin, I'll make one thing clear. My iPhone is as much a source of entertainment and mental engagement as it is a working tool. I have avoided the pitfall of thinking of it purely as a device for getting things done. The way I organize my home screens reflects this balanced use. All home screens are numbered starting with page 2. Page 1 is called the Today view. We've discussed that earlier in this guide. The number of apps that fit on your dock and home screens will depend on the size of your device. On my device, each home screen can hold up to 24 apps. My dock holds four. I keep apps I use regularly or want to have particularly handy either on my first home screen or in my dock. To be on that default screen, they have to be the apps I

turn to first in a relevant situation, or else apps I use the most frequently. Just because an app isn't on the dock or first home screen doesn't mean I value it less.

The First Home Screen: Tools Used Most Often

I reserve this first home screen for the apps that I most often turn to in whatever situation they might apply. This is my virtual desktop of sorts. At the top left just below the status bar, you'll find a wonderful app built for writers called Ulysses. You're reading the results of its capabilities right now. A flick to the right, the MindNode app is a recent addition. It is fully accessible mind mapping software. I wish I had discovered it earlier. It promises to be very helpful in collecting ideas I think of and reminding me how they're connected to each other. The Day One Journal app is a flick to the right. Journaling is a practice I've been trying to get back into since I've stopped blogging regularly about personal life events. There are real therapeutic benefits to writing down one's thoughts, and Day One Journal is built specifically for that purpose. Flicking right, we enter my group of primary references. Presuming you can spare the onboard storage space needed for the files containing the compressed contents, the Kiwix app gives access to many gigabytes of free reference material including Wikipedia, Wiktionary, and other freely

available references usually requiring an Internet connection to search. Provided you have the room to spare, you can download these complete resources onto your device. Due to its splendid accessibility and ease of use, Kiwix has moved from being something kept around for emergencies to being a highly valued primary reference tool. If you ever find yourself in circumstances where cellular and WiFi data is expensive or unavailable, Kiwix will see you through if you have loaded it up with the references you might need. One example might be anybody living in the far northern or rural regions of Canada where connectivity tends to be far more costly than in more central urban areas. Get to a point where you have WiFi access and download the complete Wikipedia, Wiktionary and/or many other references for use when you're offline. You can then easily search all of them from within the same app. Those who don't have the gigabytes to spare for offline references may find the Wikipedia and WordWeb apps to be fitting substitutes. They take advantage of constant connectivity to make use of online references.

Next to the right is the Garner's Modern English Usage app. This has proved to be a very handy resource when considering a turn of phrase or expression. Another flick to the right reveals the indispensable Google app. Whatever you might think of their

privacy policies, they really know their stuff when it comes to quickly and efficiently tapping into the Internet for answers and information. That was, after all, Google's original purpose. It is last but not least completing the small but powerful group of most often used reference tools. Regardless of circumstances, these apps should prove more than adequate for most situations a casual writer encounters.

Next come apps that keep me on track. They now include the Fantastical 3 calendar and the Reminders app included in iOS. Completing this trio was, until recently, the Westminster Chimes app that gives me helpful sonic reminders of time's passing while I'm absorbed in my work. However, now that I wear an Apple Watch, the watch will perform this function. The Watch app now graces the spot where Westminster Chimes Full once occupied. The PCalc calculator amply handles any mathematical questions I'm liable to throw at it. The Cardhop app provides easy access to information about the people and corporations in my circle of life. It is followed by the Gmail, Messages, Skype and Twitterrific apps. Together, these take care of the bulk of my social and work communication needs. Next are four apps to help me with the real world. The Seeing AI and Voice Dream Scanner apps put artificial intelligence plus my iPhone's camera to work, helping me read printed material and identify objects. If

I need to borrow some working eyes to get something done, the Aira app is ready and waiting. Should I want to go for a walk, the BlindSquare app sees to it that I can know what landmarks are nearby and find my way home again.

We're now within easy finger's reach from the bottom of the screen where two apps are well positioned to keep me aware of what's happening in the world. Apple's News app makes a tremendously interesting endless source of current information. Meanwhile, the Weather Gods app allows me to literally hear what the weather is like and become quickly informed of conditions outdoors. Completing this home screen's contents are three more apps that don't really group categorically but are, nonetheless, very handy. The Ferrite recording studio app takes care of any audio recordings I may want to undertake. The assistEyes Wallet app is where I can safely store all of the more sensitive information I might need in a hurry. Finally, the Files app completes my home page.

Rounding off what I consider to be my work area is my dock, which is at the very bottom of any home screen you happen to be on. In my dock, I have the Phone app at the bottom left. To the right are the Safari web browser, the Settings app, and at the far right, the App Store. These give me access to four very frequently used things that need to be as handy as possible no

matter which home screen I'm on. While I've sometimes moved one of these apps elsewhere to have a different app take a slot in the dock, at least three of these four have occupied my dock for nearly a decade. I doubt I'll move any more than one of them from the dock at any time.

The Second Home Screen: Where Fun Meets Knowledge

With a three-finger swipe to the left moving us onto page 3, I welcome you to "Heaven on iPhone!" This page is where I rest, recharge, and find out answers to the countless idle questions that come to mind, annoying my better half Sara endlessly. This home screen is all about literature, stimulating knowledge, entertainment, and enjoyable media consumption of all kinds. Apps that prove exceptionally valuable in these areas tend to find their way onto this home screen.

My complete personal library of audio and ebooks take pride of place at the very top. Information access is one of the benefits of owning an iOS device that I find the most liberating and valuable. Even while completely offline, this area gives me access to an inconceivable amount of precious stories, advice, and knowledge about anything I'm likely to be interested in. here, you'll find the Word of Promise Bible that combines a fully accessible and navigable text Bible joined with an audio-dramatized version. Next come the Apple Books, Kindle,

VitalSource Bookshelf, D&D Beyond, Dolphin EasyReader, Audible, and Voice Dream Reader apps. Together, these brim with thousands of informative and entertaining audiobooks and dramas I've collected over many years. Voice Dream Reader is one of those "must have" apps. It is tremendously useful as a means of reading ebooks particularly from independent publishers who provide them in PDF or ePUB formats. It can do a whole lot more including play zipped MP3 files, which tends to be how audio dramas are often sold digitally outside of industry giants like Audible. The Dolphin EasyReader app lets me access books on the CELA digital library available to any Canadians who have a disability that makes reading regular print difficult.

Audible is a commercial service letting me acquire professionally narrated audiobooks as well as shows and audio dramas. Beside these apps are a pair of dedicated homes for world-class audio drama produced by Big Finish Audio and Graphic Audio. Each company has developed their own app to aid in the easy enjoyment of their creations. Thankfully, they were well aware of their blind audience and did a splendid job making their apps accessible.

Now, we enter the territory of streaming audio entertainment. The Music app lets me tap into Apple's massive music library. Also, as of iOS 13, it can be used in conjunction

with Siri to quickly tune into any radio station or Internet radio streams I might want to hear. This includes CBC Radio One, the AMI Audio stream, or Internet radio stations like Mushroom FM. Next come the Castro and TED apps that provide me with an endless source of podcasts and short informative lectures, respectively. Being Canadian, I like my CBC. The dynamic duo of CBC Listen and CBC Gem apps are living proof of that. Past those is the BBC iPlayer app. The BBC public service provides some splendid audio and video entertainment from the UK. The NPR One app gives me access to stations and shows from National Public Radio. This is the American equivalent to the CBC and BBC. All of this audio is free to enjoy.

After that, I have the AMI, Apple TV, Amazon Prime Video, Netflix, and YouTube video streaming services ready to hand and often used. You might not expect a blind person would be very interested. However, due to increased levels of audio description plus attention paid to making the apps accessible with VoiceOver, these services have become far more attractive and useful than they once were. YouTube is a wealth of interesting and informative content made by people all over the world and put up for all to enjoy.

In the bottom right corner of the page, the Games folder awaits my pleasure. This folder contains many screens worth of

games that I won't likely access while in a hurry. I've, therefore, found it advantageous to put them in their own folder, removing numerous home screens worth of apps that would have made navigation more cumbersome. As you might imagine, the Games folder is opened quite frequently. Current favourites are Six Ages: Ride Like the Wind, Blindfold Pinball, and Dice World.

The Third Home Screen: The Top Desk Drawer

Page 4 is a place for utilities, financial apps and other often useful apps that don't fit into any particular category. In effect, it is a place for apps of relatively high importance that didn't quite justify a place on the first home screen. At the top left, the References folder contains a collection of rarely used reference tools that has grown over the years as I've sought out useful apps. Examples include the First Aid app, which contains medical instructions for emergencies.

In case my primary document scanning and navigation apps prove insufficient to my needs, I have the Prizmo 5 app and the Nearby Explorer Online apps ready for action. Next come three apps used for providing environmental sound. The Naturespace app gives me access to a wide range of natural soundscapes that I find very helpful and pleasant to have playing while I write. A new addition is the myNoise app, which lets you build your own constantly changing soundscapes using different elements of

sound. Even more recently obtained is an app called Soundscapes, which promises to bring a growing range of soundscapes recorded by different artists to my ears. It seems accessible so far.

Next over to the right, you'll find WordWeb. This app combines Dictionary with Thesaurus and also allows me to tap into more extensive dictionary and thesaurus apps if I choose without needing to dive into the references folder. The Notes and Scrivener apps are standing by for writing emergencies when my first-choice apps aren't accessible. Backpack Studio and Dolby On may prove useful for live recording of lectures and podcasts. Should I want to record a recipe, the Paprika Recipe Manager 3 app is ready for that. Find My is a good app to have ready should one's AirPods become misplaced. the Shortcuts app has yet to be used but was an important addition to iOS 12. Since obtaining my Apple Watch, I've moved the CARROT Fit, CARROT Hunger, and Zombies, Run! apps onto this home screen, making it a kind of health haven. The Health app is another app that comes with iOS that can help keep track of fitness information. Another recent addition is the Canada COVID-19 app developed by Thrive Health in partnership with the Canadian government. Should the COVID-19 crisis be ongoing as you read this, you may want to check in the app store for this app or a similar one created for your own country. Financial apps also

seem to be congregating on the fourth page these days. Next is app for my bank of choice is there along with the Wallet app. The app for my cellular carrier and internet service provider sits beside the Numbers app, which is there in case I need to handle spreadsheets. I don't use these apps every day, but when I need them, I head on over to page 4 and put my financial affairs in order.

The Fourth Home Screen: News and Gossip

Page 5 is my newsstand where any apps created by news outlets I care about find a home. It is also where I put any apps and links to websites built by people creating sources of information that is especially important to blind people. Typical items in this category include Blind Abilities, Blind Bargains, AccessWorld, and of course, AppleVis. News apps from the CBC, Google, the Guardian, and the Canadian Press have their places here. Although the Apple News app lets you tap into a tremendous amount, I sometimes find that other apps can lead to different perspectives on stories. Towards the bottom of the page are a number of social media apps like Facebook, which I don't use often enough to be on the first home screen but still need to be handy when circumstances demand. Facebook and its Facebook Messenger app are prime examples of services I use a bit grudgingly.

The Fifth Home Screen: My Digital Endless Mall

Page 6 is for shopping and business interaction. On it are shipment trackers, Kickstarter, eBay, etc. You can get damned near anything online these days. Dinner, electronics, groceries, and everything in between. The sixth page is my favourite endless digital mall. Chances are good that either a store's custom-designed app or its website will be accessible to me as a VoiceOver user. Accordingly, a mixture of both are on this virtual Promenade. Some examples are the Amazon website, the Apple Store app, the CNIB online store, and apps like Swiss Chalet or Uber Eats for ordering meals delivered from local restaurants to my door. Being in the Greater Toronto Area, we can use the Grocery Gateway service and have groceries delivered as well. It's a hip and happening home screen. You can learn a lot more about these apps in the section called A World Market in Your Pocket.

The Sixth and Seventh Home Screens: Occasionally Useful Odds and

Ends

These next two screens are where any apps that are useful every once in a while can be found. Here, there are navigation apps like Maps and Transit, etc., that might prove more ideal for certain situations other than what I commonly experience. I also keep a number of different writing apps including Pages, iA

Writer, Wattpad, and a bunch of notetaking apps. The Personal Diary app is there. I tend to be more of a blogger, but one never knows. A wonderfully accessible dice roller called Natural 20 is there. There is a perfect example of one reason I have at least a couple of apps which seem to do the same thing. Natural 20 takes a very different approach than Ready to Roll. I have yet to test these apps in actual roleplaying games to see which proves more suitable for me. There's also the chance that apps I rely on will no longer be available or that others will improve dramatically and be worthy of more common use. I've experienced things like that many times. There are a number of Internet radio apps like ooTunes and Triode. The ooTunes app in particular has served me well for many years. I tend to use Siri and the Music app that comes with iOS. However, the ooTunes app still occasionally comes in handy.

There are other apps that struck me as a good idea to grab while they were free or on sale. Everything from fitness apps to messaging apps I've never had occasion to use. Many of the apps I cover later in this guide are ones that I briefly researched for review purposes or as possible different choices to what I've gravitated to.

Beyond the Seventh Home Screen: Here be Dragons

At this point, we'll end our tour. Beyond page 8, we would leave the more organized and reliable virtual floor and descend into the murky and ever-expanding equivalent of an unfinished basement. Here lie all sorts of apps. Any additional retail shopping apps tend to end up here as well as utilities. Apps that I almost never use but am loathed to remove from my PHONE. Part of the reason for this reluctance is how very tiny most apps actually are. The Audible and Music apps are perhaps as much as 100 megabytes combined. The Music app is less than 20 megabytes. Yet, I have easily 50 gigabytes of data in the form of audiobooks and music albums consuming space on my iPhone. Most apps don't require much data at all so why get rid of them? It's not like my iPhone is any heavier carrying them around. Some apps have been superseded by others. Others await possible updates or changes in my own circumstance that might make them more useful or preferable. There's no hard limit to how many apps there can be on your device other than the amount of onboard storage you're willing to fill with them. I therefore find it expedient to keep them around in case they are radically improved to the point of deserving a spot on the first eight home screens. This has happened more often than I would have bet on over the past decade as accessibility awareness has grown and

Apple's accessibility tools have improved. Every so often, I rummage around in this virtual basement and emerge with something shiny and useful that I suddenly remember I have. It's always wonderful to discover that an app that was once utterly useless due to inaccessibility has now become a joy to use.

Reflections on Ten Years of Treasure Hunting

Overall, I've found it exhilarating to be gathering the tools and games that have formed the real heart of my iOS experience. As things have developed, I've spent a lot of time on the cutting edge. That edge does tend to cut every so often. A number of apps that I once greatly enjoyed have disappeared from the app store or simply stopped working for lack of upkeep. Others have been with me nearly since the beginning of my journey.

I hope this brief glance at what's on my own iPhone is helpful to you as you start building your own collection. At the very least, I hope it gives you a greater sense of the kinds of things that your iOS device makes possible. I discuss a large number of these apps in greater detail in appropriate sections of this guide. Finding a good way to arrange your apps so you can develop a sense of where they are is pretty important. I've been in plenty of situations where I haven't wanted to tell Siri out loud to open a given app. At the end of this guide, I will

offer more reflections on my overall journey with iOS. You may also want to look at the section The Apple Ecosystem. Together, this should give you a sense of the economics of the environment you're operating in. Thankfully, prices for apps are low enough that you won't go broke trying apps that prove less than ideal or inaccessible. Now that I've shown you around, lets move on.

As You Wish: Changing Settings to Suit Your Liking

After getting home with my brand-new iPhone 4, one of the first things I had to do was to make use of the Settings app. I had to connect my iPhone to my home WiFi and make certain I had the latest iOS version. I also wanted to have a good look around and get a sense of what kinds of things I could change about how my iPhone behaved. Everything was blessedly simple. Before long, I had completely changed how VoiceOver spoke, selecting a different voice and speech rate. I had turned down the brightness of my screen to 0%, saving all kinds of battery power. After some experimentation, I found the Typing mode that best suited me. Finding the Sounds area of Settings, I selected a ringtone and event sounds that I preferred over the default ones. Slowly, as I made more choices, this strange new rectangular slab began to feel more like something I truly owned.

I hear a good many complaints from people who feel that iOS won't let them do what they want. Whenever I've probed deeper, I usually find that what they want is perfectly possible. They just didn't know where to find the choice they were after. Chances are that the choice they were unaware of was in the Settings area of iOS. It really pays to invest time in getting

to know the many choices presented through this application. Are you being distracted by notifications while trying to work or navigate via GPS? The Notifications area of Settings lets you choose which apps can generate notifications in the first place. You can also exercise a lot of control over whether apps can interrupt you with information, or silently add their information to the Notification Center for later retrieval at your convenience. All options regarding how VoiceOver behaves are found in the Settings app. Storage management, security settings, connectivity choices, and many more choices affecting how your iOS device works are also found in Settings. You'll want to drop in often as your situation changes. No decisions you make in Settings are ever set in stone. You can always change settings and adapt your device to current circumstances and changing preferences.

Generally speaking, you should think mainly in terms of global changes of behaviour you wish to implement. While many apps have settings unique to their operation, you'll most often go into Settings when you want to make macroscopic changes that apply throughout iOS regardless of which app you might be using. For example, you may want to use UK English and spelling rather than US. Perhaps, you want to turn off the autocorrect or spellcheck capabilities because you never make typing mistakes.

Maybe, you need to free up a large amount of storage space in a hurry. For small, quick, less drastic changes, there are usually ways to do what you want while inside the app you're using.

There are so many options that if I tried to cover all of them, I would doubtless fail and overlook some. Rather than doing this, I'll leave that to the user guide Apple has already created for your iOS device. You can use Apple Books to read it. Instead, I'll explain in detail how to get around in Settings so you have a good idea where you'll find what you're after. Rather than explaining each and every setting, I'll focus on the more crucial ones that have been instrumental in my experience. Also, whenever it makes more sense, I'll cover settings in other sections and simply refer you to them as appropriate. A good example of this is when discussing settings related to privacy and security. These settings are covered in the section called Digitally Defending Yourself. It seems far more sensible to cover security aspects all in their own special section. I'm in Settings all the time as my circumstances change or just to keep an ear on how much storage space I'm using. I have the Settings icon in my dock so it's always handy.

There have been a few recent changes in where branches actually are in Settings since I began work on this section. The most major and welcome of these is having the Accessibility

area, formerly tucked away inside the General settings branch, take up residence right on the main trunk three spots past General. This will hopefully lead to increased overall awareness of the wide range of accessibility options like VoiceOver that are included in iOS. Another big change that took place was having iCloud storage separated completely from the storage onboard your device. To manage onboard storage, go into the General branch and find Storage. Meanwhile, iCloud storage is a branch in the area at the very top of Settings that has to do with your Apple ID. I very much approve of both these major changes as iCloud storage is really a feature that relies on your Apple ID.

Getting Around

Think of the Settings app as a kind of tree. There is a long trunk with major branches spaced out along it. The trunk and branches can be navigated like straight lines with left or right flicks using one finger. Three-finger swipes upward to advance or downward to scroll up towards the top can be used to skip through settings faster. iOS 13 introduces a Vertical Scrollbar on the right side of the screen that makes moving quickly through settings even faster. A flick up or down on that scrollbar will jump you through by increments of 10%. Double tapping on a setting or area of Settings will cause you to

either change the setting if it's a toggle or else enter the branch of related settings. Double tapping on Settings within a branch might lead to more branches and specific-related settings off the preceding level of specificity. For example, the General branch contains settings effecting the behaviour of your iOS device. The Accessibility branch contains an impressive array of options to make iOS devices useable by people with disabilities. The Storage branch found in the General area allows you to view and manage how much capacity you are currently using on your device.

Having all these options spread out in what seems an endless line can be daunting. Keep in mind that for sighted people, this is presented as a scrollable, multi-screen grid. They can quickly scan over the options visually and get where they need to quite quickly. This is even more the case on iPads where in addition to the trunk of the tree, the last branch you focused on has its leaves displayed to the right of the trunk. For instance, if you select General settings on an iPad, you will find the branches leading off from the General settings limb are found on the right side of the iPad screen. For blind people, things are a little less magically quick. Blind people can't take everything in at a glance and touch precisely what they want. Information is taken in sequentially as it is reached

or navigated to one piece at a time. It's possible to jump through the sequence, skipping over chunks hoping to land near where they need to be, relying on their memory of where things are. Thankfully, building a mental map of the Settings area isn't that hard due to how it's all organized. Once you understand the pattern and what the key landmarks are, you can skip quickly back or forward, land on a particular setting, and know how to quickly get to what you want. You'll soon come to appreciate the thought that went into making things intuitive and simple. Before we explore key areas in detail, I'll give you a quick overview to help you build that mental map.

Siri can also get you quickly to settings of interest. For example, hold down the Home button to activate Siri and say "show VoiceOver settings". While it can get you to settings fairly specifically, it can't always control them. You can tell Siri to turn VoiceOver on or off but can't tell it to connect to a WiFi network. You'd have to tell Siri "show WiFi settings" and then use the touchscreen and VoiceOver to attend to connecting to the network yourself. Also, you can't do things with Siri like turning VoiceOver Hints on or off or setting the speaking rate. Remember that Siri is meant to be a personal assistant. It was never designed to let people do absolutely everything by

speaking to their iOS devices. For that, you could use the Voice Control feature added in iOS 13.

Overview

The very first option in Settings is labelled with your name. It is where you manage anything to do with your Apple ID, payment, account information, and more. Being familiar with your options here will help avoid any unpleasantness as you begin to acquire apps or subscribe to services. Consider this area a kind of interface with the company Apple more than with your device.

Immediately following this is the toggle setting called Airplane Mode. This lets you quickly shut off all WiFi, cellular, and Bluetooth communications that might interfere with flight operations while on an airplane. Next are a group of four branches letting you control communication methods your device uses including WiFi, Bluetooth, and cellular data. Think of the Airplane mode toggle plus the four following branches as the communications grouping. It ends with the Personal Hotspot branch.

Next come four branches of settings that are all about how and when your iOS device communicates information to you. I think of it as the awareness grouping. This begins with Notifications where you can decide which apps are allowed to interrupt what you're doing to provide possibly useful or vital

information. The Sounds & Haptics branch lets you customize your ringtone and other audio and physical cues delivered via taps and vibrations. The Do Not Disturb area lets you turn on and schedule the Do Not Disturb mode as well as customize what it prevents from interrupting you. Screen Time is a feature that lets you track how much time is spent using apps. You can also limit when and how long apps can be used. This can be helpful dealing with addiction to games and social media. It can also help limit what children can do on their devices or yours.

The next large grouping of branches all has to do with configuring aspects of how your device behaves. I think of it as the configuration grouping. The group begins with a very important branch called General. There, you'll find a large number of important branches letting you control such things as Language & Region preferences, the iPhone Storage onboard your device, obtaining Software Updates, and much more. The Control Center area lets you customize which options are available in the Control Center and what order they are in. Display & Brightness is where you can control aspects of how the display behaves. It's also where you'll find the Auto-Lock feature for your device. Next comes the Accessibility area. Here, you'll find all of the features Apple has developed to make it possible for people with a wide range of disabilities to use their

products. This area includes the settings for the VoiceOver screen reader.

Past this point, we enter a long stretch of somewhat disorganized branches of settings letting you control various aspects of how your device interacts with other apps as well as other aspects of security. Let's call it the security grouping for the sake of our mental map. Starting with the Wallpaper area, which makes no functional difference for blind people, this area extends across Siri & Search, Touch/Face ID & Passcode, Emergency SOS, Battery, Privacy, iTunes & App Store, Wallet & Apple Pay, and finally, Passwords & Accounts. All of these aspects round out things that cut across your overall experience regardless of which app you might be using.

Now, we enter a segment of branches that, with some exceptions, relate directly to apps created by Apple. We'll, therefore, call this the Apple grouping. Starting with Mail, this area covers: Contacts, Calendar, Notes, Reminders, Voice Memos, Phone, Messages, FaceTime, Maps, Compass, Measure, Safari, News, Stocks, Health, Shortcuts, Music, TV, Photos, Camera, Books, Podcasts, and last of all, Game Center.

Once you pass the Game Center, you're in a different territory that will grow larger as you accumulate more apps. Each app will automatically get an entry in Settings and can be

found within this area. Simply double tap on the name of an app to get to its settings. They will be kept in alphabetical order, which makes it easier to navigate to settings for the app you want as your collection expands.

Once you're in a branch or subsection of Settings, you'll always find a Back button located at the top left corner of the screen below the status bar. On an iPad, the Back button will appear below the status bar near the middle but on the left side of the screen. This lets you exit that branch and move back towards or onto the main trunk. For instance, VoiceOver settings are two levels deep. Level one, accessibility. Level two, VoiceOver. Using the Back button while in VoiceOver settings returns you to Accessibility settings.

Within branches of settings, things are often divided by headings. This speeds up navigation once you turn the rotor to Headings. Flicking up or down with one finger will move you to the next or previous heading if any headings are present. For instance, headings within the Accessibility settings include: Vision, Interaction, Hearing, Media, and Learning. Once you reach a desired heading, flick right to go to options related to the heading. The first option under Vision is VoiceOver. Double tapping on this will bring you into VoiceOver settings.

Types of Setting Controls

Some settings are toggles while others are branches. If a setting is a branch, it will always say "button" after the name of the setting and status information. For example, flicking right onto the VoiceOver button, you'll hear VoiceOver on Button. Double tapping on this brings you to VoiceOver settings. The first button you come to within VoiceOver settings will say VoiceOver On. After a short pause, presuming Hints are enabled, you'll hear "double-tap to toggle setting". If you double tapped this button, you would shut off VoiceOver. Airplane mode is the first option in the main trunk of Settings and is also a toggle. Double tapping it instantly activates or deactivates Airplane mode. This mode instantly turns off all transmissions from your iOS device such as Bluetooth or WiFi, making it safe to use on airplanes.

Among the various settings, you will also find sliders. You can change the value these are set to by flicking up or down with a finger while you're on them. Brightness and Volume settings are examples of sliders. These sliders don't rap around. If, for instance, you set brightness to 0% and then flick downward again, you won't find that brightness jumps to 100%.

It can be worth your while to explore the settings screens, feeling around with your finger to get a sense of where things are, rather than flicking left and right to reach everything. If your muscle memory is good enough, you will increasingly be able to touch near where a particular setting is, which can speed up making desired changes. The amount of settings that will fit in a row and in a screen's worth of settings will differ depending on the size of your device. Now that you can get around, we'll examine key areas in each of our groupings in greater detail. Remember that when it seems sensible, some settings are discussed elsewhere. Most notably VoiceOver settings are discussed in the section about VoiceOver rather than in this one.

Your Personal Space: Apple ID, iCloud, and More

The very first thing you come to after double tapping on the Settings app is a Search field. This may come in handy as more settings are added to this area as you acquire more apps. The next thing is a button labelled with your name. Double tapping on this button takes you into what I think of as your personal locker area. This area is where you manage anything related to your Apple account, iCloud storage, and ID.

Your Apple ID is your key to the kingdom. This area lets you decide on things like whether you want extra iCloud storage

space or how you want to pay Apple for services, books, movies, etc. Typically, you will have created an Apple ID during the setup process. This is where you can set up a credit card to be used with Apple where any expenses incurred can be charged. You can also manage any subscriptions, set up the Find My feature to locate lost devices, and more.

Keep in mind here that this is not where you manage your Touch or Face ID or your device's passcode needed for unlocking. The Password & Security settings in here have to do with your Apple ID, which isn't tied to a specific device. It is because of this separation that when you upgrade to a new device, all of your digital belongings such as apps you've purchased come along with you.

The Communications Grouping

Your device derives all of its real value from its ability to communicate. It does this through Bluetooth, WiFi, and presuming you've purchased a device with the capability, through cellular data. Each of these methods is useful. Many of us will be familiar with the basics of Bluetooth, WiFi, and cellular communications as they have been around long before the advent of iPhones. However, I'm aware that for some of my readers, this may be your first experience with a device that employs these methods. For those who may be unfamiliar with these terms, I

will explain what each of these communication methods is used for. I'm an English major, not a technocrat or computer scientist. I have a very basic non-technical grasp of these things. Once you're on the Internet, those who have an interest can easily find more in-depth explanations than what I'll provide over a few paragraphs here. Those who already understand these methods should skip ahead to the next third-level heading where I'll describe each branch of the communication grouping in detail.

The term WiFi is used widely to refer to a method of connecting to the internet without wires. A central device called a "router" is hooked up directly to the Internet using a wired connection. This router is able to broadcast and receive signals, allowing other devices to be able to access the internet without needing a direct wired connection. The router my wife and I used in our apartment was provided by our Internet service provider. It takes up a small portion of my desk space and is around 15 or 20 centimetres tall. This router lets me connect my iPhone or iPad to the Internet no matter where they are in my apartment. I might be sitting on the couch, washing dishes in the kitchen, relaxing on our balcony, or working in the bedroom to escape noise in the main room. I could even potentially be outside my apartment in the hallway or perhaps on

a neighbour's balcony. WiFi routers can be powerful enough to allow for continuous connectivity through walls and even floors. For larger areas, WiFi signal strength can be boosted using devices placed close enough to the router to broadcast its signals farther. WiFi connections are typically found inside houses, hotels, libraries and other buildings for use by people inside or near these structures.

While there may be a limit to how much bandwidth or data is available via WiFi depending on one's service provider and chosen plan, people generally treat WiFi like an unlimited resource. This is because it is typically less expensive than cellular data. We tend to think of it much like we consider water in our homes. We're less mindful of how much we use, since people typically subscribe to plans that have a lot of data available. We download movies, stream broadcasts, load books onto our devices and so forth without really thinking about how much data we use. If you're wanting to do a lot of heavy uploading or downloading, WiFi is what you would likely prefer to use due to speed and cost.

Bluetooth communication is normally used for short-range communication between devices rather than for Internet connectivity. I am currently typing this on a physical keyboard connected via Bluetooth to my iPhone. I'm hearing the results of

my work using AirPods (which are earbuds) that are also connected via Bluetooth. This lets me get up and move freely without worry about snagging a wire on anything I may pass by.

Cellular data is used when you're away from WiFi. You might need a map of the area you're driving through. Perhaps, you want a suggestion of highly regarded restaurants in your area. Perhaps, you want to download an ebook that you forgot to put on your device while at home. You might want to check your email while waiting for a bus. All of these things and more are possible thanks to cellular data.

If WiFi is the tap providing endless water inside the home, cellular data is the bottled water you take on the road. There used to be a far more pronounced difference between the information transfer speed you could get via WiFi and that which was possible over cellular networks. This difference still exists but is far less noticeable these days. Cellular data is transmitted using cell towers and satellites. Maintaining this network is costly, so the data plans tend to be more costly or have limitations. I'm on unlimited internet WiFi and cellular plans. On WiFi, unlimited really means unlimited with no strings attached. I need not worry about how much data I use downloading Netflix movies or audio content. I can download the entire contents of Wikipedia as many times as I like without

considering the amount of data that uses up. Meanwhile, I would never dream of doing these things on cellular data. My unlimited cellular plan gives me up to ten gigabytes at best possible speed. If I use over 10 GB, I don't ever run out of data. Otherwise, they couldn't call it an unlimited plan. However, things will take far longer to accomplish, since my speed is dramatically throttled down unless I pay for more data at maximum speed. I'm therefore far more conservative of my cellular data in case I should need speedy access before my cap is renewed at the end of each month. Other cellular plans differ in speed of network and data limitations depending on where you are.

WiFi Settings

Upon entering the WiFi branch, you'll first find a toggle you can use to turn your device's WiFi capability on or off. While turning this capability off can save power required to constantly check for available WiFi networks you may want to connect to, the amount of energy saved is relatively small. If you're connected to a WiFi network, you will find it listed right after the on/off toggle. Along with its name, you'll also find a report of the number of signal bars available giving you an indication of the speed and reliability of the connection. Three bars are as good as it gets. Less than three bars either

means the connection source is far away or obstructed perhaps by walls or floors. You'll also be told whether networks are secured or unsecured. Secure networks require a password and/or other credentials to be allowed to use them. My own network is protected by a password that prevents any of my neighbours from making use of it without my permission. Should we have friends over to visit, I can tell them the required password if they want it.

Flicking past this network, you'll find a More Info button. As its name implies, double tapping it will take you into an area with more information about that particular network. Most of this information will be unnecessary for the majority of users. It includes things like the IP address, subnet mask, and other items of which I have only vague understanding. However, you'll also find an Auto Join option that you can toggle on or off. This tells your device whether to simply automatically join this network whenever you're in range. I have this enabled for my home network. You will also find an option to release and renew your connection, which may possibly help when you're experiencing connectivity issues.

Next, you'll find a heading called Networks. Past that point, you'll find a list of any networks detected by your device. Double tap on a network's name if you want to "join", or

in other words, connect with it. You will then either simply be allowed to connect if it is an unsecured network or prompted for the required password or other credentials if it's a secure network. After entering any needed information, simply double tap the Join button and you should be connected provided no mistakes were made. If the attempt was unsuccessful, you will eventually be told this. However, you won't necessarily be notified if the attempt succeeds. You will simply be connected and able to use the network.

At the far end of the WiFi settings past all of the networks, you'll find a couple more items, one of which is a toggle that determines whether your device will automatically join known networks that you have previously connected to when possible. If no known networks are detected, you will be asked if you want to join any unknown networks detected in your area. Another toggle determines whether your device searches for and joins personal hotspots if no WiFi networks are detected. We'll touch on personal hotspots later in this section.

Bluetooth Settings

The Bluetooth option takes you to where you can pair your iOS device with a wide range of accessories like keyboards, speakers, headsets, etc. You can also choose to deactivate Bluetooth when you don't need it. This can save some battery

power, but the amount saved is quite negligible. I tend to use accessories quite regularly including AirPods, so I keep Bluetooth on.

The first thing in the Bluetooth settings branch is an option to turn the Bluetooth capability on or off. After that, you will find any Bluetooth devices you have previously connected to your iOS device. Aside from the device name, you'll also be told whether the device is currently connected. To reconnect a device, make certain that it is ready and nearby. Double tap on the device name, and your iOS device should attempt to connect. Past these devices, you'll find any devices within range that are ready to be paired with, or in other words, connected to your iOS device. Simply double tap the name of the device to initiate a pairing attempt.

Pairing devices is reasonably simple. Things like speakers and headsets will simply connect. Typically, such devices will have easy methods to put them in pairing mode, which you should always do prior to double tapping their name. For example, if I want to connect my Trekz Titaniums, I first put them in pairing mode. I then flick through the list of devices and double tap on its name. It will then pair and sound will start coming through the headset rather than the speaker built into my iOS device.

Other accessories including keyboards and Braille displays can be a bit more of a challenge, since they often require you to enter a short number on the keyboard followed by the "enter" key. All well and good if you're familiar with the accessory and know where these buttons actually are. Somewhat more problematic if you're dealing with a keyboard whose design has been altered to save space. Braille displays should actually be paired in VoiceOver settings rather than as a standard Bluetooth device. If a PIN number is required to connect with one of those, it can be entered on the iOS device. Once a device has been paired, you shouldn't need to pair it again when you want to use it in the future. It should, in theory, pair automatically when both devices are near each other and powered. In practice, I've had to cause my iOS device to forget about a keyboard or other device when something has gone wrong with the pairing and then pair the device as if for the first time. Not every day, but frequently enough to be bothersome.

The More Info button beside each device's name takes you into a small branch containing information and choices relative to that particular connected accessory. Don't ever presume that there's only information to be found here. For one thing, there's the Forget This Device option. This can come in handy when something goes out of sync with the connection and you need

to connect a misbehaving device from scratch. Depending on the accessory, there may be more options. If you have a set of AirPods, for instance, they add a number of configuration options to the More Info dialogue reached by the button beside their name.

Personal Hotspot

This option allows iPhones or iPads with cellular connectivity to share their connection to the Internet with other devices. For instance, you could use your iPhone to provide a WiFi connection for your laptop if you wanted to. While on vacation, parents with data plans might allow their children to connect their devices to play a game or communicate with friends. You can create a password so that only people with your permission may use your data.

The Awareness Grouping

Notifications Settings

The Notifications branch lets you determine which applications can alert you to things that happen while you're otherwise occupied. It also lets you choose which apps can place notifications in an area called the Notification Center for later review. Depending on your situation, you might want to make adjustments to this. When I'm recording lectures, I don't want to be interrupted unless it's actually important. Perhaps,

I'm waiting for delivery of a package and don't want to miss knowing about its arrival while I blather away. It's less of a hassle to stop working and get the package than to have to go and pick it up somewhere else. I therefore wouldn't want to use the Do Not Disturb mode, which stops phone calls from ringing. Instead, I would disallow apps from alerting me so that their notifications appear quietly in the Notification Center. This sort of thing is also helpful when you're using a GPS device to navigate and don't want to be pulled out of that app unless it's important.

Each app capable of generating notifications has a corresponding setting within the Notifications settings. At the start of these settings are a couple of what I think of as "master" settings. The first allows instant and overriding control over when notification previews are shown. Notification Previews contain some or all of the contents of a notification. For example, a notification from Twitter might include the contents of a tweet. This is all well and good provided the information isn't in some way sensitive. It can help you quickly determine whether something needs to be dealt with urgently or may safely be left until later. However, if you're likely to get an email about your outstanding debt, or a tweet about what a wimp you were in last week's boxing match, you may want that

sort of information to remain safe from innocent eyes and ears. You can therefore elect to reveal Notification Previews always, only when your device is unlocked and presumably in your control, or never. When previews aren't shown, you are still notified that a given app has a notification for you. You simply won't know anything else about it until you investigate further.

As fluke would have it, just as I wrote the preceding sentence, a Kindle book I preordered became available. Because I chose to allow Notification Previews, I learned the book's title. In this case, the book was one I had since learned was a book for children covering the same ground as a book for adults the author wrote previously. I was therefore able to return the Kindle book right away before the window during which you can return such purchases expires. Had I not allowed for Notification Previews, I would merely have been told that the Kindle app had a notification for me. I may in consequence have failed to learn what I learned in time to get my easy refund.

The next button gets you into an area where you can allow or disallow apps from making shortcut suggestions through Siri while on the lock screen. Each and every app you have can be allowed or disallowed individually.

Past this point, we get into a section complete with a heading that is called Notification Style. This lets you

determine if, how, and when apps are able to notify you about information or the results of activities that happen while the apps are running in the background and not in focus. Each app that can generate notifications has an entry. As you obtain more apps, this section will grow larger. The apps will always be listed in alphabetical order. Flick left or right over the entries in the list. You'll hear the app's name followed by the current setting for that app. For instance, "sounds and badges". To change these settings, double tap on the app's name and then flick right to go over the options. Double tap on an option you want to change and then flick right over any options presented. Double tap on the choice you want to make. It's all pretty simple and intuitive. We will now go over the available Notification Style choices in detail. Make certain to read about the Notifications Center earlier in this guide for further options regarding the management of notifications.

Let's choose the Aira app as an example. This app lets you call trained sighted agents for assistance when you need it. The app itself is free and very handy to have on one's iPhone. Double tapping on its name in the Notification Style section, the very first option we come to is whether to have the ability to produce notifications be on or off. Double tap this control to toggle between on or off as desired. Some apps can generate a

lot of notification, so there may well be times when you simply want a total break from them. Turning this setting to off will achieve this.

Flicking to the right of this switch, we come to another heading called Alerts. This is followed by a series of buttons that tell iOS where you will allow notifications from an app to appear. Double tapping any of these buttons will change its state to selected or unselected. Before the button's name, you'll hear the term "selected" read out if you have set it to Selected. The first of these buttons either allows or disallows alerts from the Aira app to appear on the lock screen, which makes them readable even when your device is locked. The next option determines whether or not notifications from Aira appear in the Notification Center for later reading. The next button asks whether notifications from this app may appear as "banners". Banners appear on the screen Even when you're working in other apps. if you allow banners, the next button over will let you determine whether these are "temporary" or "persistent". Temporary banners appear only for a short time before disappearing. Persistent banners will need to be dismissed before they disappear and you can continue your other activities. Double tapping on the Banner Style button will cause

the two options to be visible so you can choose between them. You can then hit the Back button at the top left.

The next buttons determine whether you will allow sounds to be played, alerting you to a particular app's notifications. Many apps have their own unique notification sounds that play instead of the default alert tone. Next to this on-off toggle is another similar button that lets you choose whether "badges" can be used. App badges may include pictures or numbers such as the number of waiting messages. The Fantastical app has a number of badge options chosen from within the app itself. One of these is to display a number indicating the current day of the month.

The next couple of options are under a heading called Options. The first allows you to choose a setting for notification previews that differs from the default setting. This way, you can selectively allow or disallow previews for key apps rather than having to have all of them be tied to the overall choice made in the first setting. The final setting has to do with how and whether notifications from a given app are grouped to make them easier to manage efficiently. Some apps like Facebook, Twitter, Mail, etc., can generate an awful lot of notifications. This setting takes you to a range of choices regarding putting notifications from this app into a group of their own or not to group them at all. The default choice is

"automatic", which lets artificial intelligence figure out how notifications should be grouped for you.

Sounds & Haptics

This branch lets you customize the volume level of important sounds like the phone ringer and alert sounds. Also, it lets you choose whether you want haptic feedback when system sounds play. Don't confuse this with a similarly named branch of settings in the VoiceOver settings area. The choices here are pretty self explanatory, so I'll let you discover them for yourself.

Do Not Disturb

The Do Not Disturb option lets you schedule periods where you won't be interrupted by incoming calls, messages, or alerts from various apps you may have. These options can go a long way to making you the master of your device rather than feeling like its slave. We will therefore go over them in some detail below:

The first option in the Do Not Disturb settings allows you to simply turn this mode on or off at will. While the mode is on, calls and notifications from apps will be silent and not interfere with your work or rest. This blanket of protection can be altered if desired by the settings that follow. Rather than having to turn on this mode when desired, you can schedule periods when it activates automatically. For example, I have the

schedule for my iPhone XR set so that Do Not Disturb mode automatically turns on between the hours of 11 PM and 6 AM. If the Scheduled setting is set to "off", then none of the schedule options will appear.

The next settings in this area let you customize Do Not Disturb mode to better suit your circumstances. Perhaps, you want absolutely nothing to disturb you. On the other hand, you may want your device to behave as usual provided that it's unlocked. However, once you've locked it, you don't want it alerting you to anything overnight or during another critical time. The two options under the Silence heading let you specify this.

Next, there's the matter of phone calls presuming your device can receive them. Options under the Phone heading give you a wide range of capabilities. You can have it so absolutely no one can call you. Any incoming calls will go automatically to voicemail, presuming you have this. Otherwise, you can allow everyone to call you so the mode only shields you from app notifications. You can allow calls only from people in your Favorites group of contacts. Alternatively, you can specify another group of contacts you've created and wish to receive calls from even when in Do Not Disturb mode. Another option deals with repeated calls. This lets you specify that if you

receive two calls within three minutes from the same person, the second call will automatically be let through and your iPhone would ring. You can switch this off if desired so that even repeated frequent calls don't get through.

The next heading has to do with Do Not Disturb While Driving. As blind people are unlikely to drive, this mode can be annoying if you're a passenger in a moving vehicle. I have it set to manual so that it will only turn on if I activate it from the Control Center.

Screen Time

Over the years, people have begun to grow more conscious of and alarmed by how addictive their smart devices can be. As of iOS 12, Apple introduced Screen Time to help combat this. At the top of Screen Time settings, you'll find the first part of this strategy. Charts are displayed with your current overall statistics during the day. You can also get a chart of the last week to get a sense of how much time you spend on your device. Flicking past this information, you come to a wide range of options, letting you take firm control.

The first option lets you schedule downtime away from the screen. During this time, only apps you permit or phone calls are allowed to function. You can use a passcode to override this

if necessary. Once the scheduled period ends, things will return to normal functioning.

The next option lets you set daily limits for individual apps, websites, and app categories. These categories include social media, reference, productivity, games, etc. The advantage of doing this by category is that any apps you subsequently obtain will be included in their respective categories, automatically falling under the same time limit. All limits are reset daily at midnight.

The next option lets you set apps to be always allowed regardless of screen time limits. Each app is listed in alphabetical order. A heading called Allowed Apps is followed by a group of apps that you have selected as being allowed at all times. After these apps, you'll find a Choose Apps heading. After this heading, you'll find all apps that haven't been designated as being "always allowed". To do so, simply double tap on their name and they will transfer into the "allowed apps" group. If you want to remove an app from Allowed Apps, simply double tap it and it will return to its place in the larger mass of apps. By default, the Phone, Messages, FaceTime and Maps apps are in the group that is always allowed.

Next, you'll find a Content & Privacy Restrictions button. This takes you into settings you can also find in the General

settings area. This is an especially useful area for parents, as it lets you shield children from unwanted influences and also makes certain they can't do things with your device that you don't want them to.

The next option lets you set a special passcode for Screen Time. This can be used to get past limitations and restrictions. The passcode is a four-digit number. Once you set this up, be certain to remember it, since you'll need it should you want to turn it off or override any restrictions you set. I've heard from more than one person who wanted me to help them with a device that they restricted needlessly and then forgot the passcode. There is nothing I can do for people in such circumstances, so please don't go there. Unless you have a good reason to restrict activities with a passcode, just don't do it. If you do, write the code down somewhere.

People with more than one iOS device can share information across devices, making the information available on other devices connected to your iCloud. The Screen Time feature can be used in conjunction with Family Sharing. This lets parents have some control over what can happen on their children's devices.

The last option in these settings lets you completely turn off the Screen Time feature. Statistics will no longer be kept and limits won't be enforced. Remember that if you don't turn on

any restrictions, all that happens is that statistics are kept about how much time you spend doing various things on your iOS device. This feature won't interfere unless you instruct it to.

The Configuration Grouping

The General Settings Branch

There are a lot of settings in this major branch. The most frequently used of these for me is the Storage branch, which is covered in the iOS Operating System section of this guide. There are plenty of other branches to cover here that affect aspects of how your device behaves. While you won't need to change things too often, it's good to know what's in the General branch.

If you ever want to know something about your device, double tap on the About button. A lot of information is nicely kept in this area. This includes everything from your device's capacity, to its model and serial number, to the current number of apps installed. It may help someone give you good tech support, especially if you don't know much about your device yet.

Software Update

The Software Update button takes you to where you can obtain updates to the iOS operating system. You can also check to make certain you have the latest version of iOS. If a newer

version is available, flick right over the items in this area, and you'll find a Download & Install Now button. Double tapping this will begin the process. You'll need to enter in your passcode or use Touch/Face ID to verify your identity. After this is done, the update process will begin. You should be charging your device so that a lack of battery power doesn't interrupt proceedings during this delicate process. For the early part of the process while the update downloads, you can check on progress since VoiceOver will still work. However, once the downloading has finished and installation begins, you will go through a period of time when your device will be silent as the update installs. You simply need to wait and hope things go well. This can be distressing especially for beginners. I've never had to wait any longer than half an hour. Before contemplating resetting your device, I would recommend waiting at least that long. Interrupting an operating system update isn't something to be done lightly. Your patience should be rewarded with your device coming back to life with the latest iOS version installed.

If you prefer, you can turn on automatic updating in this Software Update area. This way, updates to iOS will be automatically downloaded and installed when your device isn't being used, has a WiFi connection, and is charging. Due to the

likelihood of potentially serious accessibility glitches particularly with the first and second updates to an iOS version, I can't recommend this in good conscience. On balance, having the latest version of iOS is a good thing overall. However, a regression or bug that only affects people needing accessibility features can too easily slip through the cracks and wreck your day. It's just better to look before you leap. Check on the AppleVis site and with others who you might know who have updated already. Once you know it's safe or are willing to take the risk, get the update manually as described above.

AirDrop

The AirDrop setting lets you choose how broadly you want to use this handy method of sharing files and information. Nobody can steal anything you don't want them to have just because you're discoverable. However, you may wish to turn this capability off so that you won't receive AirDrop requests from people nearby. You can also set this feature so that only people in your contacts can discover your device for AirDrop sharing. Alternatively, you can set it so that everyone can discover your device.

Basically, AirDrop lets you send and receive information from other people who own iOS devices and are physically near to you. When my wife Sara moved into our apartment, her GPS app

didn't have the local landmarks that I had already put in to help navigate the local surroundings. I used AirDrop to share some key GPS landmarks with her so she could get around more easily. I've also used AirDrop to share other files with people who were close by. There are only the three choices outlined above in the AirDrop setting. I have mine set to only be discoverable by people who are already in my list of contacts.

Background App Refresh

One of the ways your iOS device seems so downright ready for anything is that it lets apps run in the background and update their information. This makes certain that when you open the Mail app, it has likely checked recently for new email messages. When you're going about your day, this lets your weather app of choice alert you that it is likely to rain. Your GPS app can let you know about landmarks you're approaching even when your device is locked or you've been pulled into the Phone or Messages app, because it can refresh its information in the background.

Perhaps, you don't care if you find out about the latest Twitter happenings right away. You may not care that your emails are kept up to date until you're ready to open your mail app of choice and check them yourself. Apple gets this and has included settings in the Background App Refresh area to help you fine-

tune which apps can or can't refresh while they're not in focus. Minimizing the ones that refresh can save battery power as well as data. In this area, there is a master toggle letting you decide on mass whether all apps may or may not refresh in the background. Alternatively, you can leave the master setting on and turn off the apps you don't want refreshing in the background. Apps are listed alphabetically and are either on or off. Double tap to change the status.

Keyboard Settings

The settings in this area help customize how you can input information. You can add or remove virtual keyboards for different languages and third-party keyboards, etc. You can also change which options are active while they're being used. For instance, you can turn on or off autocorrect, spellchecking, and other similar options. This is also where you can enable dictation, which puts a Dictate button on the keyboard you're using. If dictation is enabled, it can even work offline. You can simply double tap the Dictate button, say what you want typed after the beep, and then double tap with two fingers anywhere on the screen to stop recording. The Text Replacement setting lets you assign short forms of phrases to automatically be replaced with other things when you type them. For instance,

"CIA" might automatically be replaced with "Central Intelligence Agency". This kind of thing can help speed up typing for people.

Reset Options

Perhaps, things aren't going well and you need to start over from scratch. maybe, it's just that network and device connectivity has gone wacky. maybe, you can't remember all the location and privacy settings you've done and need to rethink all of that. In such circumstances, this is where you can go back to default settings and try again. None of these options should be used lightly or need to be used often. Especially the ones that erase all content and settings. Use those only as a last resort

The first option in this group simply lets you Reset All Settings to their factory defaults. It won't damage any content on your device. The next option will Erase All Content and Settings so you'll be starting over from absolute scratch. Before you sell or give away your device, use this option to wipe it clean of all your digital property. The Reset Network Settings option is relatively safe to use provided you remember any passwords you need to sign into networks. All of that information is erased so that everything connects as if for the first time. This is a commonly used method for resolving issues where external devices such as keyboards aren't connecting

properly. The Reset Keyboard Dictionary might get you out of a situation where you've added a misspelled word or can't remember all of the clever abbreviations you've thought up. Another option lets you Reset Home Screen Layout to the factory default. Any additional apps will be arranged in alphabetical order. Another option lets you Reset Location & Privacy settings.

For all of these options, you'll need to confirm that you want to take the action they are for. You'll need your passcode number or possibly your Apple ID password. Once implemented, there's no going back, so think carefully before you use these reset options. If you're backed up to iCloud or iTunes, you should be able to restore from that backup. This can be a time-consuming process, and you'll want to be on WiFi to have all your apps and other data restore as speedily and inexpensively as possible. Remember that some content and apps aren't set up to use iCloud. For instance, I've needed to delete all of the Kindle books on my iPhone and then redownload them each time I've upgraded to a new iPhone or restored from an iCloud backup.

Other General Settings

At the very end of the General settings branch is a Shut Down option. This lets you safely turn off your device if you find the side button and volume button combination tricky to use. There are also settings for Language & Region preferences,

Date & Time, VPN connection if you need that, and more. Be sure to take the time to look around this branch carefully. There's quite a bit tucked in here, and it's all useful at least occasionally.

Control Center Settings

While never absolutely essential, the Control Center is a very handy feature of iOS. The settings in this area let you customize what can be found in the "Center" and when it can be accessed. There is a toggle that lets you decide whether the Control Center can be accessed from within apps or only from the home screen.

Immediately to the right of this setting, you'll find a button called Customize Controls. Double tap this and you will be in an area that lets you select, remove, and reorder controls to maximize how effective the Control Center is for you. There's a heading called Include, beneath which you will find any options you have selected for inclusion in the Control Center. Double tap these to remove them if you wish. You may also rearrange them via the rotor or by dragging the Reorder buttons next to them up or down. The rotor will let you move controls up or down one space at a time. Learning to drag controls by double tapping and holding down the Reorder button and then moving your

finger up or down can speed up the process when you've gotten the hang of it.

Below the Included options, you'll find a heading called More Controls. You can find other controls that you may want to consider including. Simply double tap on any control you wish to include in your Control Center. It's pretty much that simple.

Display & Brightness

This area has one of those nice self-explanatory names. You can select between a light or dark overall appearance. Alternatively, you can have your device automatically switch to an appropriate mode based on options that become available if Automatic mode is turned on. The default there is Light Until Sunset. The next settings have to do with screen brightness. I habitually have this set to 0% to save battery power. However, you might want to set this higher so that a sighted person is able to see and read your display if you think you may need assistance. The next setting is called Night Shift, which you can schedule or disable. It removes colours from the display during the evening that are known to cause sleep difficulties. I have no idea whether this effects totally blind people.

Your device may or may not support True Tone. This feature uses light sensors in your device to adjust the colour pallet of your display according to current ambient lighting conditions.

This is presumably helpful for those who are able to see. Should this feature prove troublesome when making digital drawings or something, it can be disabled.

The Auto-Lock feature causes your device to dim and then fully lock the screen if enough time passes without action being taken. The intentions of this feature are to save your battery power and enhance your overall security. However, this feature can be most annoying if you like to pause and think about what you're doing before doing it. I disable this feature by setting to Never. Provided you remember to lock your device when you're not using it, this is perfectly good. However, you can set it to various lengths of inactive time before it dims and locks on you. The default is annoyingly brief especially while you're learning the ropes. I think it's thirty seconds. Certainly no more than a minute. it's one of the first things I attend to when I get a new device.

The Raise to Wake feature causes your device to become active when it is lifted or tilted. This is a basic on/off toggle that I prefer deactivated. I find that more often than not, it causes my iPhone to go active in my pocket when I don't want it to. The text size and choice of views don't make much difference to totally blind people but may prove useful for people with low vision. However, I believe that the features

found in Accessibility settings will likely address their needs far more capably.

Accessibility Settings

There are a whole lot of settings in this space. Paradoxically, the two most useful branches in this area are VoiceOver and Voice Control settings. Because these two branches of accessibility settings are so integral to the accessibility tools they control, these particular branches will be discussed in the major sections dedicated to VoiceOver and Voice Control. When dealing with things as pervasive in your experience of iOS, it seems more sensible to keep all the information you'll need in one place. Other parts of this large and useful area will be discussed below. We won't cover everything as exhaustively as we will with the VoiceOver and Voice Control settings elsewhere in this guide. However, we'll go over some of the settings that are most likely to benefit people who are blind. People with specific disabilities should explore this area of settings thoroughly and also consult the user guide for their device and version of iOS put out by Apple. There may very well be options here that will help with your particular disabilities.

The Accessibility settings branch is divided up into sections via headings based on type of disability. The topmost heading is Vision. Below are Physical and Motor, Hearing, and

finally, General. We'll explore each section for useful treasures.

Vision

Most people who are classified as legally blind actually have some impaired but potentially useful vision. Apple has incorporated extensive tools to maximize what people with different eye conditions can do with their iOS devices. The very first and most often used of these features is called Zoom. It magnifies areas of the screen as needed. You can customize how this feature behaves in many ways. Once the feature is turned on, you can cause Zoom to occur by double tapping with three fingers on the screen. Dragging three fingers over the screen will cause the effected area to move to the part of the screen you need "zoomed". You can change the Zoom level by double tapping with three fingers and then dragging them over the screen. You can have Zoom follow where iOS or the app you're using thinks focus should be so that this is magnified automatically. There are keyboard shortcuts you can set much like with VoiceOver. You can have a Zoom Controller constantly available on screen that lets you adjust various aspects of Zoom as needed. You can also choose how large a region will be automatically zoomed. The default setting for this is Full Screen. You can apply filters to Zoom including Grayscale,

Inverted, and others. There is also a setting to set the maximum Zoom level. The default is 5.0x. This seems a brief description of a very powerful feature. Being totally blind, I don't feel qualified to go much further.

Sometimes, you need to magnify something in the real world like print on a product or sign. Apple includes a Magnifier option that takes advantage of your device's built-in rear camera. This seems to be a pretty simple option to use. When turned on, you can use the Accessibility Shortcut to activate and dismiss the magnifier. Unlike Zoom with its many settings, there's just one for the magnifier. This is whether or not you want Auto-Adjust Exposure. Basically, this lets the artificial intelligence in your device adjust brightness and contrast based on ambient light settings. Sounds like something worth taking for a spin.

The Display & Text Size button should definitely be checked out thoroughly as there's an awful lot tucked away behind it. There are colour filters, adjustments that can be made to labels, the ability to reduce the white point, and lots of other things which will forever be utterly beyond my experience. People with any sort of visual difficulty short of total blindness should definitely explore all of the options in here. There's bound to be something that can help at least a little.

Generally, people seem to like the animated look of iOS. Elements move in and out of focus as needed and are animated in other ways providing for a lively environment. For some people, the animation and motion of elements on the screen can be troublesome. The Motion area has settings to reduce things like the parallax effect present in the normal interface. These settings are unlikely to benefit totally blind people other than the one that disables the automatic playing of videos. These often have sound that can make other elements of websites harder to hear. People with low vision may find various options in here to be helpful as they can reduce clutter.

The Spoken Content settings let people who don't need a full screen reader still enjoy having text spoken aloud when desired. This can be helpful for people with reading difficulties or people who have vision difficulties that make reading a strain on their eyes. Of course, some people simply like to be read to every now and then. Settings in Spoken Content let you select text to be read out loud. Alternatively, you can swipe downwards on any screen with two fingers and have the contents read aloud. For blind people encountering a speaking bar as they go about their business, turn off the Speak Selection option and all your hang-ups with the speaking bar, which has somehow become active, will be a problem of the past.

The Audio Descriptions setting is the last in the Vision area. You can use this to make any descriptive audio included in videos, shows, and movies be played automatically by apps that support this setting. This can make a tremendous difference in the ability of someone who is blind or can't see well enough to follow action on the screen. The Apple TV and iTunes apps plus others like Netflix will honour this setting and play descriptive tracks when they're available. However, other apps like CBC Gem don't seem to hook into this setting. Instead, after a documentary or show begins playing, you need to select descriptive video or close captions using the controls that pop up during playback. If you have the Audio Descriptions setting on but don't hear described audio while using a third-party app, remember to check for options within that app. Especially after you start content playing. Look for options in the controls that emerge when you double tap on the video.

Physical and Motor

The settings in this section help people who find it physically difficult to use the standard touchscreen interface. The difficulties can stem from a wide range of causes from cerebral palsy through to paralysis. This is where the Voice Control setting is found. Voice Control will be described in its

own section later. Meanwhile, there are a whole range of other settings to help people adjust the interface to their needs.

Touch

The settings behind this button are designed to help people who find it hard to touch and operate the screen. Some of these may prove helpful, but I've found some features that I've actually chosen to disable. These include Reachability, which lowers the top half of the screen when you swipe down on the bottom of the screen so that the top is easier to reach. You hear a small hiss indicating when this has occurred. I find this very annoying and disabled Reachability so stuff would stay the heck where it was.

Another potentially annoying or helpful feature depending on your circumstances is Tap to Wake. This will, as its name suggests, cause your display to wake up when you tap it anywhere with a finger. This feature won't unlock your device for you. You still need to do that. However, I found that when I carried my iPhone in my pocket, it would tend to come alive and start reading out the time or my notifications as I walked along. I doubt this would be as likely to occur while using an iPad. It can be nice not to have to use the Action button to awaken your device from slumber.

Switch Control

This lets you operate your iOS device using any of a wide range of devices that are all basically "switches". These can be on or off, and you would perhaps nod your head, breathe, blink, etc. to indicate your intention. I've never heard of a blind person using this in conjunction with VoiceOver. However, given how flexible these features are, I believe it should be possible if possibly frustrating. The cursor moves over options and you need to activate the switch when it reaches what you desire.

You can adjust all sorts of things including how options are grouped, how fast the cursor moves over things, and much more. There are sound settings, so you might find it helpful to use these in conjunction with VoiceOver. I have never had occasion to use any switch devices, so I have no idea how well this might work. I've heard that it's possible to use the camera built into your device as a switch. You can nod your head and possibly do other facial gestures to indicate your intent.

Hearing

These settings are for people with anywhere from mild hearing difficulties through to people who are completely unable to hear sound. Some hearing devices are made for use with Apple products and take advantage of Made For iPhone (MFi) technology. If you use such devices or other hearing aids, you'll find

settings in this section to help maximize what you can do. This includes streaming sound via Bluetooth to your hearing aids. You will also find a TTY setting letting you use the Phone app to make and receive TTY calls. I see no reason why this wouldn't work in conjunction with VoiceOver. If you have a hardware TTY device, you can pair it to your iPhone and have it used rather than Apple's TTY software if you prefer.

The Audio/Visual button has settings to do things like adjust the balance between left and right or force mono audio playback. These settings don't require hearing aids and may prove useful to blind people with hearing difficulties.

General

This area currently contains three small branches. The first is Guided Access. This may be useful for people with attention issues. It keeps you in a single app and allows you to control which features you want to use. You can set time limits and a passcode to override this confinement. The Accessibility Shortcut can be used to turn this feature on or off. I've most often heard of this being used in the classroom to keep the attention of students focused on apps used for assignments.

The next item is Siri. If you cannot speak well enough for Siri to understand your voice, you can set an option in this branch that lets you type your commands and queries. When you

invoke Siri, a typing field will appear. SIRI can still respond via voice and text on the screen as normal. You can also choose when you want to receive voice feedback rather than just text on the screen.

The very last item under the General, Accessibility heading is a very important one. It is the Accessibility Shortcut. On devices with a Home button, press this three times rapidly to invoke the Accessibility Shortcut. On devices without a home button, press the Action button on the side of the device three times rapidly. The Accessibility Shortcut can be set to activate and deactivate one or more accessibility options that you find useful. Most blind people will set the shortcut for turning VoiceOver on or off. You can set it to also turn on other features such as Zoom, Voice Control, Switch Control, or Invert Colors, among other features. People should set up this shortcut right away after setting up their iOS device.

The Security Grouping

Siri & Search

This area contains settings that let you customize how you invoke Siri and which apps are allowed to tie into Siri. You can choose whether Siri can be used while your device is locked and you're on the lock screen. You can also choose whether to have your device listen for the key phrase "hey Siri" or whether you

just want to invoke Siri by holding down the Action or Home button until a beep is heard.

You have other choices to make such as what language Siri should use, which region and gender voice should be used, when to provide voice feedback, and information about yourself through your contact information created during setup.

You can also choose the apps that can tie into Siri, allowing them to be suggested by Siri among other things. You can specify whether things can be used by Siri to look up answers, and which are accessible from the lock screen. Things are pretty self-explanatory here, and there is a section all about Siri later in this guide.

Touch/Face ID & Passcode

This is where you set up your passcode and other biometric security measures that keep your information safe on your iOS device. To learn more, please read the section in this guide called Digitally Defending Yourself.

Emergency SOS

This feature lets you easily use your iPhone to call emergency services if you're ever in need of them. This requires that your iPhone have a SIM card. There are a number of settings in here that are all fairly self-explanatory. If your device has a Home button, you can press it rapidly five times to trigger

the Emergency SOS feature. When this is done, any contacts you have set up in the Health settings will be alerted and shown your location. Also, the phone will count down and then call whatever the local emergency number is. For instance, in Canada, this is 911.

There is a setting that appears if you've elected to use Automatic Calling. In this case, a warning sound will play as the countdown before the call is made happens. You can turn off this warning sound if you wish. If your iPhone has no Home button, the Side button is used instead. The Call with Side Button setting may be a good setting to turn off. Recall that pressing the Action button three times is how you invoke the Accessibility Shortcut. Some people have accidentally triggered a call to emergency services when they were clicking the Action button too rapidly and not putting a pause in between sets of three clicks. Turning off the setting will prevent this ever resulting in five rapid clicks being counted and acted upon. This makes it safe to invoke the Accessibility Shortcut quickly. Unfortunately, this safeguard doesn't seem to be available on older iPhones with home buttons like my iPhone 7. When Call with Side Button is turned off, you can still invoke Emergency SOS by holding down the Volume Up and Side buttons for around a second.

A menu then pops up containing an emergency option as well as an option to shut down your iPhone.

Battery Settings

There are a couple of potentially useful settings here. Most importantly, there is Low Power Mode that, when activated, operates your device in a more power-conservative way. This will reduce its background activities like downloading and fetching mail. When your device is plugged in to charge, this mode will turn off automatically. The prior setting, Battery Percentage, displays your battery level as a percent rather than a visual indicator.

The button called Battery Health is something you should double tap every once in a while. It will initiate a test of your battery to determine how much charge it is capable of holding relative to when it was new. Over time, your battery will lose overall capacity as it ages. The chemicals inside become fatigued and eventually won't be able to supply enough power at once to allow your device to operate at peak performance. After two and a half years of hard use, my battery is still capable of delivering peak performance with its health measured at 86%. When peak performance is unsupportable by the battery, measures are taken to reduce the power needed by your device and slow its performance but protect you from unexpected

shutdowns. Your device can still safely be used, but it's time to think about either replacing the battery or upgrading to a newer device.

There is a lot of information in this area including recommendations of settings you may wish to adjust to conserve power. You'll also find a button to test your battery health. There are also charts that detail your battery level over the past day, week, etc. Turning your rotor to Headings, you can flick down to another heading that separates this time-based battery information to data broken down by app and activity. Using these charts, you should be able to determine what is draining your battery the most and make decisions accordingly.

Any charts in this section can be described by VoiceOver through the rotor. In fact, when you move onto a chart, flicking up or down will cycle through options to describe the chart, play an audio representation using tones, summarize the data, and describe the data series. These tools can quickly give you a picture of your battery level over time.

Privacy Settings

These settings are discussed in the section called Digitally Defending Yourself.

iTunes & App Store Settings

In this small branch, you can make decisions regarding whether content and apps you purchase from the app store or iTunes are downloaded automatically or not. You'll find on/off toggles for a number of purchase categories. These include apps, updates to those apps, music, Apple Books and audiobooks. Next, you'll find a heading called Cellular Data. Below it, you'll find an option to choose whether automatic download can occur using cellular data rather than just when connected to WiFi. Next to this, you'll find an option where you can choose to be asked if a download will be larger than a set number of megabytes.

Other settings let you choose whether videos play automatically while in the app store. When VoiceOver or other accessibility settings are active, they may set this to off so that you're not distracted by videos playing. The final setting here lets you determine whether you'll be asked for ratings and reviews. These can be helpful for others making decisions about which apps, books or music to purchase. Providing such information is always optional even when this setting is in the on setting.

Wallet & Apple Pay Settings

This branch lets you set up Apple Pay. This feature lets you pay for things in the real world as well as online using your iOS device. Rather than presenting a credit card, you can simply hold your device near a point-of-sale machine and follow the steps to use Apple Pay. This involves verifying your identity using Face or Touch ID, holding your iOS device near the point-of-sale machine, and double clicking the Side button. This branch of settings is also where you can add cards to your Wallet for use with Apple Pay.

Other settings in this branch let you choose whether Apple Pay is available from the lock screen, set up a transit card, and more. Apple Pay is widely supported at retail stores and other places of commerce. This adds the security of not divulging your credit card details, since a one-time code is used for any purchase you make with Apple Pay.

Passwords & Accounts

This setting is discussed in the section called Digitally Defending Yourself.

The Apple Grouping

Mail Settings

This branch gives you the ability to configure the Mail app that comes with your device. There are a large number of options

including whether you want messages organized into conversation threads. There are choices about when or if you want to be notified when new messages arrive. You can manage blocked email addresses, decide whether you want images to be loaded automatically onto your device, and much more. For more information, please refer to the user guide that Apple makes available for your device. Also, remember that if you aren't happy with the Mail app these settings help you configure, there are many other options available in the app store.

Contacts Settings

This branch lets you configure how the Contacts app behaves. You can determine how contacts are organized. Most of the settings deal with this. However, at the very end of these is a button that lets you import contacts from a SIM card. This may ease the process of transferring to an iPhone from another kind of phone if you've already put contacts on the card.

Calendar Settings

There are a small number of settings in this branch that configure the calendar. You can choose a default calendar, override the current time zone so appointments are displayed in a time zone of your choosing, determine which calendars are used, etc. The last toggle setting determines whether Siri will

offer location advice such as an estimated time to travel from your current location.

Notes Settings

The Notes app provides a way to quickly write or draw things as the need arises. There are a number of useful configuration options here. For example, you can secure your notes with a password, keeping them safe from others who might use your device. You can choose how notes are sorted or whether grid lines are placed automatically on notes to aid in drawing, etc. For blind people, the most useful of these settings is at the end of the branch. The Access Notes from Lock Screen setting lets you choose to have a new note open whenever you use the Control Center to access the Notes app. This can be very handy if you are on the move and need to quickly get to a space where it's possible to write or dictate information. You can have it start a new note or simply continue in the current note.

Reminders Settings

This is a small branch, as the Reminders app doesn't require a lot of settings. You can set a default list if you want one other than the automatically generated one. You can also set a time when you'll be notified of any reminders that don't have a specific time during the day. You can also decide

whether reminders are shown as overdue starting from the day after their due date.

Voice Memos Settings

Again, there isn't a whole lot here. However, you can choose whether the Voice Memos app saves recordings in compressed or lossless quality. Also, you can choose whether these memos are named based on the location where they're recorded.

Phone Settings

This is where you would go if you have an iPhone and you want to configure anything related to actual phone service. You can do things like silence all unknown callers so that all unknown calls are automatically sent to voicemail. You can manage blocked callers, choose whether calls are announced, and much more. Please refer to the user guide for your iPhone.

Messages and FaceTime Settings

There are a large number of settings here that let you optimize how messages are dealt with. The Messages app lets you send and receive text messages to people who have other kinds of cellular phones. It's worth exploring the settings in here to make certain that the Message app behaves as you would like it to. Please refer to your user guide for more thorough discussion of the options here. There aren't any settings of particular use

to blind people here, and the default options have served me quite well.

Similarly, there are options for FaceTime that largely mirror those for Messages. As FaceTime is exclusively for communications between Apple devices, there are fewer settings for it. One setting of note lets you determine whether live photos can be captured during a conversation. For blind people, there may be no audible indication when someone you're talking to decides to capture a photo. If you're worried about this, you can turn this feature off to help insure your privacy.

Maps Settings

There are a large number of settings here. You can choose a preferred style of travel to be used when getting directions. It is also possible to choose units of distance, have weather information displayed, and much more. In the Driving & Navigation button, you can select the volume of navigation announcements, and choose whether other spoken content like podcasts are automatically paused during announcements. You can also choose how relatively loud you want such announcements to be. For more details, please refer to the user guide for your device as well as the section called Maps, Taps and GPS Apps.

Safari Settings

There are a lot of settings that allow you to configure the Safari web browser included with your device. Please refer to the section called On Safari to learn about these settings and more.

Health Settings

There are a number of settings here that determine how the Health app behaves and what data it has to work from. For blind people, one of the more important aspects is the Notifications setting. You can have health-related notifications delivered in a style that differs from your default settings if you wish. This is also where you can enter your health profile and Medical ID. The Medical ID can be accessed from the Emergency Dialer even when your device is locked. It contains information about you such as allergies or medical conditions that emergency attendants should know about. The Health Profile contains other information such as sex, age, and blood and skin type, etc. More is added depending on which apps and accessories you might use.

The Data Access & Devices button lets you control what can access and be a source of data for the Health app. This includes third-party apps and equipment such as smart scales, fitness machines, etc. It also includes other Apple devices such as an Apple Watch or iPad. You are always able to revoke access to

this data. For a lot more information, please refer to the user guide provided by Apple for your specific device.

Music, Books, TV, and Podcast Settings

Each service has a number of useful settings that will be discussed in the appropriate sections of this guide. There are a number of very useful settings that allow you to configure the Music app. These include an EQ option, which has a lot of different choices to alter how your music sounds. Please refer to the section called Carrying a Great Many Tunes.

Settings that affect how books are displayed, how large an interval is jumped backward or forward when navigating audiobooks, and more are found here. Please refer to the section called Read All About It.

The Podcasts app has a number of very important settings, especially when it comes to how much data is used. Please refer to the section called Internet Radio and Podcasts.

Further Thoughts on Settings

We've now covered a lot of the major settings where it makes sense not to cover them elsewhere in the guide. This section could easily have reached over 25,000 words had we included all settings in the same place. This is the main point of overall control between you and iOS. Just because we didn't discuss an option doesn't mean it's not present. Always check

Settings if you want an app to behave in a certain way but can find no way to achieve that from within the app itself. For instance, the game Six Ages has a number of special settings. One of these is a way to set the volume of sounds and music. You could use this to lower the volume to make it easier to hear VoiceOver during game play while still enjoying the full experience. Lots of little treasures like that await you in the farther reaches of Settings. Never give up until you have looked in Settings to see if there might be an option that does what you wish.

Digitally Defending Yourself: Keeping Your Information Safe and Secure

One of the first things I was asked to do while setting up my iPhone XR was show it my face. Holding the iPhone in front of me while facing straight ahead, I followed the spoken instructions that told me how to move my head. This movement allowed tiny advanced cameras and sensors mounted near the top of my iPhone to construct a highly detailed, three dimensional digital model of my face. So highly detailed that it's good enough to be used for payment and banking apps. Thanks to infrared lasers and other sensors, the iPhone I had just brought home now knew more about my face than friends and family who had known me all my life ever could. To unlock my iPhone or approve a purchase, I would simply have to face the camera at the top of my device and click a button twice to confirm my consent. After completing the setup process, I intentionally locked my iPhone and tried using Face ID as I was instructed. It worked like a charm. Each time I used it, artificial intelligence in my iPhone learned more about how to recognize my face from different perspectives in different ambient light.

These days, the selection of music, audiobooks, ebooks, apps, movies and more that you can enjoy on your iOS device is staggering. So is the amount of personal information you'll soon

have stored on the device if you make good use of it. Everything from addresses and contact information to health and other data. I remember reflecting after a year with my first iPhone about how much of my personal information and other things were stored there. You don't tend to think about it in totality as you slowly start adding information so you can do this or that more conveniently. And then, one day, it hits you. The stuff of your life is contained in a light flat slab of high technology no thicker than a pane of window glass.

It is also in "the Cloud", as people tend to think of it. In reality, that Cloud is a bunch of theoretically secure data storage and servers where you can retrieve it whenever needed rather than storing absolutely everything on your device itself. This reduces the amount of storage space you need to have on your device. For as long as I've owned an iOS device, I have only heard of one case where someone's iCloud was hacked.

These devices are designed to be as light and portable as possible. They're supposed to be your digital companions at home and while on the go. They learn a lot about you. There's all the information you intentionally enter like contacts, addresses, locations important to your life, messages, and more. Beyond that, your device learns more about you as you make use of it thanks to onboard artificial intelligence. This very portability

and all of the information they contain makes them tempting targets for theft. It's in Apple's best interests to protect all that information from theft or abuse by others. This goes beyond personal information and extends to making certain that other people can't steal the addresses of friends and family, books, apps, movies, and music you choose to have on your device. To this end, Apple has gone to great lengths to provide a safe and secure environment for iOS users and those who provide digital content. These measures extend far beyond the obvious. For instance, all apps found in the app store must be checked and approved by Apple staff, who are on the lookout for troublemakers. Incidents of malware and viruses are very rare in the iOS ecosystem. No security is foolproof, but Apple has done a remarkably good job in that department. All data on your device and stored in iCloud is encrypted in a way that even Apple can't break. To gain access to a dead terrorist's iPhone, the FBI was forced to engage the services of a security company who were able to hack into the iPhone at a high cost. Doing so is no trivial exercise. Apple was willing to go to court and refused to create any kind of universal back door to unlock iOS devices suspected of containing valuable information. They can, and will, help law enforcement in any way possible that doesn't reduce the security of innocent owners of their products.

This section will focus on elements of information security over which it is possible to exercise some direct control. These include privacy settings, passwords, passcodes, and restrictions you can activate or deactivate. This may seem a bit daunting for the non-technical people who might be reading this. By its very nature, security nearly always means a degree of inconvenience. In today's world of information, having at least a basic grasp of these measures is absolutely essential for a safe and happy experience in the iOS ecosystem. Apple keeps everything pretty simple from a user's perspective. You don't need to be a technology expert to put security features to good use. What I tend to worry about the most is people who have a hard time remembering passwords or numbers. You only need a few such items to be easily remembered when asked for. However, having them easily recalled and ready to be used is absolutely vital. I would strongly urge anybody with these difficulties to keep a recording or text file handy with that information clearly written or announced. Also, provide a copy of that information to someone who you trust. That will make it much easier to resolve security issues quickly and painlessly with a minimum of inconvenience and/or involvement from others who might not be as trustworthy.

Overall, I have had a very positive and safe experience with iOS. Not once have I had to contend with a virus or data theft. While I don't go out of my way to court danger, I don't hesitate to follow links to search results that point to new items of interest. Having been online for over twenty-five years, I have a pretty well developed but not infallible sense of what's safe and what likely isn't. Were I ever to have my iPhone stolen, I would be far more annoyed at the massive immediate inconvenience this would cause than concerned about my information falling into the wrong hands. I think Apple does a good job with security. There's a balance that needs to be struck between protection and annoyance. Apple has done a good job of minimizing that annoyance while maintaining a very high level of safety.

Some people find the thought of Apple keeping an eye on things and limiting the apps available for your device to what they approve distasteful and worrying. Personally, I'm quite happy they're doing this. I have yet to be stopped from doing anything I personally wanted to do on my device. I have, on the other hand, been saved from having to deal with some of the nasty surprises people using other operating systems such as Android have found lurking on their devices.

Some people will get these devices and then refuse to create an Apple ID or use other features due to a paranoia of big bad corporations watching their every move. Honestly, if you're that concerned about big data snooping on you, save a lot of money and get an old fashioned dumb phone or cheaper Android tablet. In fact, you could theoretically get one of each if both were on sale and still come out ahead financially. Choosing not to create an Apple ID or not bother with a passcode will place drastic limitations on what you can do with your iOS device. Other than using the apps included on the device, you won't be allowed to get more apps or update the software on your device, etc. Also, any information stored on such an unsecured device would be available to anybody who got their hands on it. You're not saving time or protecting yourself from the big bad corporation. You're just being very stupid. To enjoy the benefits of an iOS device, you simply have to accept that you're entering an economy of information. You essentially make a bargain with Apple and companies whose services and software are used through your device. In exchange for some truly remarkable revolutionary capabilities, including more access to information than blind people have ever before known, you incur the risk that information about you might be stolen or used inappropriately. Either the benefits of participating in

activities one uses these devices for is worth the risk to your information privacy or it isn't. Don't shoot yourself in the foot over misplaced fear. Provided you're not doing anything criminal with an iPhone or iPad, Apple really doesn't care what you're up to. Take precautions using the security tools discussed here and enjoy what owning an iOS device will let you accomplish.

Setting up or Changing Security

If you don't skip the steps during initial setup of your device, you'll be putting security in place while completing the overall process. The steps will be appropriate to the technology included in your particular device. At a minimum, you will be asked to create an Apple ID if you don't already have one. If you're setting up a secondary device or upgrading to a new one, you should use the same Apple ID. This gives you access to any personal information stored in iCloud plus apps or other things you've already purchased from Apple. For each device you own, you'll have the option to set a passcode. Next, depending on the device you have, you'll be able to set up Touch or Face ID. Apple strongly encourages the use of security features. However, it is possible to skip some of these steps during setup. You can always change your mind and turn on features later once you're more comfortable with using your device.

After setup is complete, you can go into areas within the Settings app to change security. These include the first item in Settings labelled with your name, the Touch ID & Passcode area, the Privacy area, and the "restrictions" area found in General settings. Also, there is the Auto-Lock setting found in the Display & Brightness area.

Your Apple ID

In the process of setting up your device, you'll be asked to log in with an Apple ID you already have or create one if it's your first device. Ideally, each customer should have one Apple ID. It's your central account with Apple. When you create an Apple ID, it is used to keep track of all information of your dealings with Apple. You use it in the app store when you buy apps and in Apple Books when you buy books. It's also used when making subscriptions to services like Apple Music. Any information you store in iCloud is also tied to your Apple ID.

An Apple ID consists of an email address and password. It is absolutely vital that you remember these. They're your way of proving to Apple who you are. The email address should be one you actually check, because there may be occasions where Apple contacts you. Also, you are sent receipts for any purchases via this address. The password you choose needs to be something you can recall, while still being hard for someone else to figure

out even if they know you. When deciding on a password, you should err on the side of it being easy for you to remember rather than being some complex alphanumeric sequence that confounds everyone including yourself. I've spent hours failing to help people start from scratch after forgetting their password or the code they've used to lock their devices. The bottom line is that all I can do is try to help you remember your passcode and password. Beyond that, you'll need to call Apple. Apple's tech support staff cannot circumvent security. While there are recovery steps, they take time and are done by a separate department. Apple would rather deny you access than risk all of your information getting into the wrong hands. Remember your Apple ID and the password you picked for it. They're your ultimate key. Keep it handy and safe like you would do for the key to your home. These devices will be like a digital home.

When asked to enter your Apple ID and password, a form will appear on screen with separate fields for each piece of information. The email address will typically be filled in already and occupies the first field near the top of the screen. You can double tap on a field to go into Edit mode, allowing you to enter or change information. When in Edit mode, you can find the Go or Done button that should be double tapped to indicate

you're finished with that field. The Delete button will be above the Shift and Go buttons near the bottom right corner. The next field will be for your password. Enter that and then find the Go button on the bottom right when finished.

Having a Passcode

A passcode is a number or alphanumeric sequence that you can use to lock your device. It's exactly like the PIN number you need to access your bank account. Think of it as your first line of defense or the lock on your front door. A passcode also encrypts mail messages and other data on your device so you can only access it if you know the number. You should choose a number that you can remember easily. Apple recommends a six-digit passcode, but you're not stuck with that. During the passcode setup process, find the Passcode Options button to opt for an easier four-digit number or a totally customized alphanumeric code of your choosing. You are allowed to use different passcodes for different devices, which are all tied into the same Apple ID. Even if you use Touch or Face ID, you'll still need to use the passcode if you restart your device or don't unlock it for a while. You can set things up so that after ten failed attempts to enter the correct passcode, all of the data on your device is erased. If that happens, you'll either have to set up your device as a new one or restore from a

backup. For the latter course of action, you'll definitely need to know your Apple ID and password.

Make certain you pick a number you can remember easily. This is especially important if you have things set so that everything is erased after ten failed attempts. I can't help people who are completely locked out of their device. Remember your passcode, Apple ID and password. They're your keys to everything.

To enter a passcode, input the digits using the number pad that appears on screen. There is a Delete key near the bottom right if you make a mistake. If you touch a bit below near the top of the screen, VoiceOver will announce how many values you have entered. For instance, it might say "3 of 6". Once you've entered the correct number of digits, wait a moment. If you've entered it correctly, your device will be unlocked. If not, you'll be informed that the code was incorrect and may try again.

Touch ID

Beneath the Home button, there is a sophisticated fingerprint scanner that reads your fingerprint and unlocks your device if it matches one that you've authorized. This is what is known as "touch ID". Instead of entering your passcode to unlock your device or approve purchases all the time, you can simply

touch the Home button with a finger. You can set up more than one fingerprint for Touch ID. All fingerprints are stored in a secure place on your device called a "secure enclave" that even Apple can't access. Apps and services using this data receive only pass or fail information. You can use Touch ID to approve purchases, use Apple Pay, and many other things. The chances of someone else having a fingerprint similar enough to your own is said to be one in fifty thousand.

To set up a fingerprint, place your finger on the Home button and then lift it as VoiceOver instructs during the setup process. It will have you place and lift the finger several times and then have you change your grip before continuing this process. This makes certain that your device has an accurate recording of your finger. I have done this for one finger on each hand for greater convenience, so I can unlock my phone using whichever hand works better at the moment. When asked to use Touch ID, simply touch your finger to the Home button on your device, maintaining the contact until you hear a ding and feel a vibration. If you are inaccurate in your placement, it is possible that your finger won't be recognized, and you'll have to make another attempt. I've never had to do this more than twice to be properly recognized.

Overall, I've had a pretty good experience with Touch ID. It's handy to be able to unlock your iPhone using one hand while it's in your pocket. I can then do things without ever removing my iPhone from my pocket if necessary. For simple tasks like reading books or navigating music, this is a nice convenience. Also, it speeds up things like purchasing books or apps marvelously. Instead of entering in passwords, you just touch your finger to the Home button, and your purchase is approved. I also use Touch ID a lot in combination with an app called assistEyes Wallet. This makes it possible to have sensitive information like passwords on hand while still having them require my fingerprint to access. This app works with Face ID as well. One issue I do occasionally find annoying is that after I wash dishes or if I have wet hands, it becomes almost impossible to use Touch ID. Especially if your hands were in hot water. I often need to resort to my passcode to unlock my iPhone until my hands return to a dry normal temperature. Cold weather doesn't help either. You either have to remove a glove to unlock your device or have cold fingers that may not be recognized by Touch ID.

Face ID

This technology is said to be more convenient and far more secure than Touch ID. On the more high-end advanced devices such

as the iPhone X or newer, a group of cameras and sensors can recognize your face, allowing it to be used instead of a passcode and Apple ID. It can even tell whether you're actively paying attention, presuming you're capable of actually looking at your device. The chances are one in a million that anyone else's face will be similar enough to yours to fool Face ID. The chances are somewhat better if they're related or you're twins. Every so often, you'll still need to use a passcode to unlock your device such as after you restart it or if you haven't used Face ID in over forty-eight hours. The same is true for other things like approving purchases. For sighted people, it is very convenient, since they need to look at their devices to use them. For blind people, it's easy to use but less convenient than Touch ID, since you need to actually face your device rather than touch the Home button while the device is in your pocket or pack.

Apple has taken blind people into consideration when designing this security feature. If you have VoiceOver enabled, it will guide you through the setup process, telling you how to move your face so it can be properly scanned. It will also disable the part of Face ID that looks for attentiveness so that you just need to face your device rather than look at it. This does reduce how secure Face ID is. Someone could knock you out

and hold your device up to your face for instance. However, take this in proper context. If somebody threatened you with bodily harm or worse, you'd probably much rather unlock the device for them anyhow. These things are only as secure as you are.

Setting up Face ID

There was some initial panic back when Apple introduced Face ID. However, it was completely misplaced. VoiceOver guides you through the setup process quite well. It tells you to hold the iPhone in front of your face and to rotate your face so the camera system on the front of your iPhone takes in all the details of your face. I ended up going through this process twice, having rushed through it too quickly the first time. The second time through, I heard and followed more of the instructions I should have waited for the first time. If you go too quickly, VoiceOver doesn't catch some instructions. If you aren't getting good results after your first attempt setting up Face ID, simply double tap on Reset Face ID and go through the procedure again.

First, after double tapping Set Up Face ID, read the instructions and description of the animation that is displayed. It shows what you need to do. Next, double tap the Got It button to start the procedure.

Hold your iPhone in portrait mode around half an arm's length away in front of your face. I get good results if the top of my iPhone is around nose level when I start. You then follow the directions to turn your face as if it were a hand on a clock face where the iPhone is the centre of the clock. If you've never felt an analogue clock, imagine your face is the handle on a crank that turns around the iPhone you're holding in front of your face. This lets the camera see the bottom and top of your face and build a 3D digital model that is stored on your device.

The second scan needs you to turn your face from side to side. During each scan, you'll be told how close to completion you are, and you will hear a series of beeps increasing in pitch to help determine how far along you are. After the second scan is done, you'll be told whether or not the process succeeds. Presuming it has, Face ID will be up and running.

Going Beyond Setup of Touch and Face ID

There are more settings in the Touch/Face ID & Passcode area. These help you determine where and when you'll be using it rather than using your Apple ID and password to verify your identity. The first heading is Use Touch/Face ID For. Beneath it, you'll find a series of toggle buttons that can be on or off. The first one will be for unlocking your device. Other choices include using Touch or Face ID when purchasing apps or

other digital goods from Apple. You can also use it to verify your identity so that any passwords and credentials used on various websites can be auto-filled for you. This can save a great deal of time.

After these, you'll find a heading that will say either Fingerprints or Face. You can add additional fingerprints or remove them. After these options, you'll find options to change and/or turn off your passcode. You'll need to enter it before you can disable it.

The next heading has to do with what can be accessed while locked without needing Touch or Face ID. You can always control music playback and make phone calls through using your voice. Again, there are a series of toggles for the Today view, Control Center, Siri, etc. Towards the end of this branch of settings, you'll also find a toggle for Erase Data. This lets you choose to have data on your device erased after ten failed attempts to unlock your device with passcode or biometric options.

Two-Factor Authentication

Designed to protect your Apple ID from theft, "two-factor authentication" sends a verification code to trusted phone numbers or devices. To access your account, Apple ID or do other potentially security-critical things, two-factor authentication means that you need information that only you theoretically

know, plus a randomly generated verification code that is sent to your device when needed and only works for a limited time. Wait too long and you'll need a new verification code. If a criminal has your device, he or she may see the verification code but won't know your Apple ID, passcode, or password. If a new device tries to log in with your Apple ID, it will be asked for a verification code. Blind people will need to memorize this code long enough to enter it correctly when needed. If that number happens to be for the iPhone that has been stolen, the criminal will certainly hear or see that number. However, that's only "one" of "two" factors securing your information. They would also need to have your passcode, fingerprint or face, and your Apple ID and password for complete access to your information. Any time a verification code is used, you will receive an email that would let you know of this occurrence. It would stop someone trying to log in via a website and cause trouble using your Apple ID. They wouldn't have the verification number, and you would be alerted to the danger. If they did have the verification number on a stolen device, they wouldn't have your passcode or other necessary information. You could then change your password or take other precautions. You can use the verification code to recover control of your Apple ID and reset your password if you believe you've been compromised.

Since only trusted devices and phone numbers can receive the verification code, you no longer need to remember the answers to security questions. You can have more than one trusted phone number or device set. Parents could have their phone number be a trusted number for their child's device. This would also be useful for people who have difficulty remembering things.

Taking Charge of Security with Settings

To have a worthwhile experience on iOS, it's vital to have a good idea how to set and manage security so that it doesn't inconvenience you unduly. The Settings area is where this management can be accomplished. Options related to security are concentrated in a few key areas of Settings. Let's begin our tour with the very first item past the Search field.

Presuming you've set everything up and haven't skipped steps, the first item after the Search field will be labelled with your name and email address you used to create your Apple ID. This is where you manage things having to do with your Apple ID, password, payment information, etc. Think of this area as having to do more with your identity in the Apple marketplace rather than about securing your device. In the passwords and security area, you can change your password and also choose whether you want to use two-factor authentication. Unless you

have major difficulties remembering a six-digit code, I strongly recommend having it turned on. This way, you can use services that require top security like Apple Pay.

The Auto-Lock Feature

To prevent battery drain and improve security, the Auto-Lock feature will cause an iOS device to lock itself after a short period of inactivity. This setting can be found in the Display & Brightness area of settings. You can set it between 30 seconds and 5 minutes or set it to Never. Normally, I have it set to never lock automatically. It gets annoying having to unlock your phone to continue doing something after merely pausing for a moment's thought. It won't suddenly lock while you're reading a book, since the cursor is constantly scrolling while that happens. As long as you're actively doing things, the auto-lock won't inconvenience you. I'd use auto-lock if I felt at all nervous that my iPhone might be stolen or misplaced. That way, there would only be a short time before your device locked itself and required your fingerprint, face, or passcode to be used.

The Screen Curtain

To help protect your privacy, VoiceOver contains a feature called "screen curtain". Since anybody using VoiceOver is likely to be totally blind and not looking at the screen, you can

invoke this feature to make certain nobody else can see what you're doing without you knowing this. It will cause your screen to be blank. This doesn't save battery power, so you'll still need to reduce display brightness to achieve that. I have display brightness set to 0% and maximize my battery life. However, you may be in a situation where you often want sighted people to be able to assist. In that case, having brightness set to around 30% or lower might be a good compromise. I don't mind having to go into the Control Center and raise brightness on those rare occasions I want sighted people to see what's on my screen. You turn "screen curtain" on or off by tapping three times quickly with three fingers. A three-finger triple tap.

Privacy Settings

Privacy settings are used to allow or prevent access to information. For instance, you might choose to prevent an app from accessing the microphone or camera or from accessing your social media accounts.

In the Settings app, you'll find the Privacy button just past the Battery button and before the iTunes & App Store button. These are all past the General button.

The first settings in the privacy area deal with access to data. Location Services, Contacts, Microphone, Camera, Health and other sensitive information each have a button. These

buttons lead to lists of apps that have requested access to that specific data. You can permit or deny these apps access to the information and may determine circumstances when this might be allowed. For instance, you can let apps only use Location Services when they're in focus and being used. No decisions made here are carved in stone. You can change these settings whenever you wish.

Below a note that explains that preceding options deal with access to data, you'll find a further set of buttons dealing with access to social media accounts. These work similarly to the buttons dealing with data. You can decide which apps may access your Facebook, Twitter, and other social media platforms you might be using. For example, a game called Dice World has an option allowing me to post tweets about my victories in the various dice games it lets you play. If I chose, I could block this capability using Privacy settings dealing with Twitter. Before a particular social media platform will appear, the app for it may need to be present on your device.

Finally, you find two buttons dealing with advertising permission and whether to let Apple have data used to improve the user experience. I don't have a problem with this and hope my data will help app developers and Apple fine-tune things in future iOS updates.

I don't tend to adjust these settings often. iOS asks you as soon as an app requests access to these services, so I don't need to go into the Privacy area unless I change my mind from my initial decision about what access an app should have. I mainly prefer apps to only use Location Services when I'm actually using them, so I've adjusted those settings the most. I would certainly appreciate the capabilities they offer if I were going into a risky situation where I knew the danger of theft was greater.

Restrictions

Restrictions are used to prevent actions from being taken without your permission on your iOS device. You can use these to prevent children from making purchases while they use your iPad to play a game. You can also prevent people from browsing the Web or using iBooks among many other things. This can give you peace of mind if you allow someone else to use your device that they can't do anything potentially harmful to you.

To manage Restrictions, go into the General area and flick right until you come to Restrictions. The button is found to the right of Background App Refresh and to the left of Date & Time. Double tap on Restrictions to enter the area.

The first thing you'll find in this area is a button that lets you enable or disable Restrictions. When you double tap it

to enable Restrictions, you'll immediately be asked to enter a four-digit Restriction passcode. Choose a four-digit number you'll remember. You'll need to enter it a second time to confirm. Once that's done, you'll need to know that code to disable Restrictions. The only other way to get rid of the Restrictions would be to restore your iOS device from a backup. This isn't a step to be done lightly, especially if you haven't backed things up in a while.

The Restrictions area is divided up into headings. These are Allow, Allowed Content, Privacy, Allow Changes, and Game Center. Within these headings, flicking left or right will scroll through a series of buttons. Double tap what you want to restrict, and you'll either switch it from "on" to "off" or else get to different options. For example, double tapping on the Safari button in the Allow heading will switch between "on" and "off". If you leave it on "off", you won't be able to even find the Safari browser, since the icon for it disappears entirely. If you double tap the Movies button under Allowed Content, you can choose the rating of movies that can be viewed on your iOS device. You can specify which country's ratings you want to use. It defaults to US.

All sorts of different kinds of content can have restrictions placed upon its consumption. Everything from

podcasts, to books, to music, to news. You don't always have a lot of flexibility. Choices are more often between allowing everything or disallowing things entirely. For instance, you can restrict explicit content in books so that your child won't even come across books featuring such material. However, you can't do more complex things like eliminate violence or taboo topics. Websites are similar. You can restrict explicit adult content or only allow visits to certain sites you approve of. For apps, you can restrict apps by their age-appropriate ratings. Using these restrictions, parents could make their children's iOS devices quite safe while still allowing for some exploration on their part. Without knowing the four-digit passcode, they may not even see what they're not allowed to access.

The settings under the Privacy heading within the Restrictions area are the same as the ones in the Privacy area of Settings. However, if you use the settings within the Restrictions area, you will need the restriction passcode to change them later.

The options under the Allow Changes heading are six buttons that deal with important areas and give you the power to disallow any changes that might cost money or compromise safety. For instance, you can use the Accounts restriction to prevent any changes being made to account information. This prevents

anybody from adding a new user account to your iOS device to get around restrictions. Other areas include Cellular Data, Volume Limit, Background App Refresh, and TV Provider. A change in cellular data, for instance, might result in you inadvertently using expensive cellular data for things that you didn't want to be able to.

The settings under the Game Center heading allow you to restrict things like adding friends or playing multiplayer games. This will be especially useful for parents who don't feel their children are ready to deal responsibly with this unsupervised contact with strangers. There are three settings here. You can disallow playing multiplayer games entirely. You can disallow adding new friends. Lastly, you can disallow screen recording. Screen recording is often used in games to share proof of noteworthy accomplishment or other information during group play. However, it could also reveal sensitive information if used carelessly.

Passwords & Accounts

Another feature that tries to make security a little more convenient is called Apple Keychain. This keeps track of any passwords for various apps and websites you might use. They are stored in iCloud, so they won't be lost even if your device is. Instead of having to enter all of that information, which may be

unique for each app or website, you can use your Face ID or Touch ID, or passcode to prove who you are. You will then have the needed information filled into the login form in the correct places. This drastically speeds up signing in. You can change or delete information stored in the "keychain" using the Passwords & Accounts area of Settings. You'll need to verify your identity before making changes in here.

Sign in with Apple

Many of us want to use social media, search engine, and other online services. However, we worry that we'll then have our online activities tracked, be targeted for ads we don't want, or that our data will be mined. A new feature introduced in iOS 13, "Sign in with Apple" lets you forego using Facebook, Google, or other commercial services to easily log into various websites.

Facebook and Google certainly provide a convenient and popular identity verification service. However, they are motivated to get as much data from their users as legally possible. This is what they sell to advertisers and how you in effect pay for convenience with privacy. Instead, you can use Apple. Their motivation is keeping your data and privacy as secure as possible. They don't make money from targeted advertising except in clearly defined circumstances that they

inform their users about. They make their money through your buying their devices and using their services. The less annoyed by advertising you are while using their stuff, the better you're likely to think of Apple.

If you use this feature, Apple will create an email and password for you. As long as you have your device, all you'll need is Face or Touch ID to log into services you've chosen to use "Sign in with Apple" to create accounts with. Any communications to the fake email created for you will be forwarded to your actual email unless or until you don't want them anymore. You can then simply stop these communications from being forwarded and be left untracked and in peace.

Parting Thoughts on Security

I would encourage all of my readers to consult the various sections of the user guide for your specific device. There can be differences depending on the age and type of device especially when it comes to biometric security measures. Regardless of which device you have, there will be many ways to keep your information safe. This is an important aspect of owning an iOS device. If people are careless with the information stored in their devices, it can put you and your contacts in danger of fraud and other consequences. Please use reasonable precautions.

Remember that good security comes as much down to good habits as it does to any of the settings discussed above. Think about where you and your device are. If you're in the open, perhaps making certain your screen curtain is on before entering your banking password might be wise. Are people close enough for you to hear and understand what they're saying? They may be close enough to see and hear what your device is saying and doing. How are you currently connected to the Internet? Think about whether you want to make purchases or do other potentially sensitive things while connected to free public insecure WiFi. There are all sorts of little habits and tricks you can use to increase your overall security.

In most cases, apps where information is stored allow for making it necessary to use a password or Touch or Face ID to access information. A good example of this can be found in the Notes app. If you want, a note that contains information of a sensitive nature can be encrypted, requiring your fingerprint, face, passcode, or password to unlock it.

Another thing to consider as blind users is that your device announces things. A great deal of what gets spoken aloud while you may not be wearing EarPods or other headsets is due to Notifications. You can set them to be delivered quietly so they appear in the Notifications Center but aren't spoken aloud. As a

kind of middle ground, you can have a sound play when a new notification arrives for a given app. In fact, many apps come with their own unique sounds for this very purpose. Look in the Notifications settings and take advantage of those options. Not all notifications should be spoken aloud upon arrival. You can also disable the ability to access the Notifications Center from the lock screen, requiring your device to be unlocked before gaining access to notifications. This is less convenient but more secure. Adjust this sort of thing if you're going into potentially troublesome environments. You can always adjust such settings back to more convenient options when back in safer conditions.

If you need to unlock your device or enter a password while not wearing EarPods or other headsets, you can minimize the chances of people easily overhearing that information. For instance, if you're using "touch typing", run your finger intentionally over wrong numbers and letters, only lifting it when you reach the correct next item to enter. If you're using the default "standard typing", you can safely touch as many wrong numbers or letters as you like, only tapping twice quickly on the correct ones which will then actually be entered. It will be harder for any unwanted observers to tell exactly which letter or number is correct when you get good enough at this.

Hold your device facing you below head level. After all, you don't need to see it yourself. This way, it'll be harder for people to know what's being entered and precisely where your active finger is when you actually enter things.

Apple has a section in the user guides for its iOS devices called Privacy & Security. Anyone who has any concerns about security should give this nicely written section a read. Apple does a much better job than I at going through the array of tools at your disposal to guard your information. You need not be an expert to understand this and will be able to make informed choices finding the right balance for you between security and convenience.

On the other side of the coin, don't use extra security you don't really need. I can't count the number of people I've been powerless to help because they've set Restrictions and then forgotten the four-digit code. They'll disallow Safari and then wonder where their web browser went. They'll want to purchase an app or an in-app purchase but discover that they've restricted that ability on their iPhone and then forgotten their code and can't disable the Restriction. I've even had one fellow restrict his GPS app from using Location Services. I wish I was joking there, but I'm sadly not. There's simply no point of having a GPS app to help you get around if you prevent it from knowing

where you are. People do some really stupid things getting all paranoid and hung up on security and privacy concerns. Take reasonable precautions but don't go overboard with this stuff.

The App Store: Adding Capabilities to Your Digital Home

If you wish you could do X on your iOS device, chances are good that "there's an app for that". You've almost certainly heard that phrase before. An "app", short for "application", is a piece of software that allows you to use your iOS device to do something. There are likely over a million apps and games available for that simple flat object you hold in your hands. I'm writing this guide on one such app called Ulysses. There are apps to help keep you organized, read books, navigate around your area, and infinitely more possibilities. More than likely, there are many different apps that do something you want to accomplish. You can learn about and select the app that best suits your skill level and circumstances. This gives you a kind of control over where you want complexity versus simplicity. For example, Apple includes a word processor called Pages free of charge for anybody who owns a modern iOS device. While I could have used it to write this guide, I didn't like how it approached writing or its lack of an easy way to spellcheck documents accessibly at the time I began this project. It has since improved in terms of accessible practicality quite markedly, so I would urge people to try this freely provided option before looking farther afield. I searched for and found many different word processing apps and chose the one I

currently use instead. These explorations had a financial cost and left me with numerous writing apps. That will certainly happen to you in areas of special interest as you pursue that perfect app for your specific needs.

When you want to see if an app that you own has been updated or want to find and acquire a new app, the "app store" is where you'll want to go. All apps are sold or offered freely in that venue. You'll find it on your home screen. Simply double tap on the App Store app to enter the store. Before we go further, be aware that not all apps are available in all countries. I live in Canada, and there may be some apps that I reference that you cannot find or obtain. The same applies to me. Being in Canada, there are apps in the US and other country app stores that are unavailable to Canadians. Thankfully, most apps aren't restricted in this fashion. Another thing to note is that depending on restrictions placed on purchases by whoever owns your device, it's possible that you won't be able to obtain in-app purchases or subscriptions without permission of the device owner. For the purposes of simplicity, I'm presuming in this section that you own the device you're using and that no restrictions are placed on your activities.

As of iOS 11, the app store has undergone a radical redesign. Apple wanted the app store to offer a more curated

experience that put their knowledgeable staff and deep learning artificial intelligence to use. An editorial staff works hard to produce content such as articles about app developers and curated collections of related apps. Artificial intelligence helps customers find apps related to their interests. This matches closely with how the Apple Music service and the Podcasts app help customers find what they want in vast collections of options. This design was altered further in iOS 13 mainly to accommodate the new Apple Arcade gaming service. Sadly, I don't expect that we'll find any accessible games in the Apple Arcade. That entire tab is useless for blind people until enough accessible games are present to make it worth paying for the service.

This section focusses on the use and navigation of the app store. I'll describe the various sections of the app store and how to navigate them. Also, I'll walk you through the process of obtaining an app, which is the same whether or not you need to pay money for it or not. However, I would strongly urge people to also read the subsection of The Apple Ecosystem portion of this guide called App Store Economics. There, I will go into greater depth about the financial considerations, which shape your experience with apps. Apple exerts a great deal of control over what can be offered in the app store as well as how

developers are allowed to charge you for their creations. This has implications about how motivated developers might be to maintain their apps, make them accessible if possible, and improve them over time. Tremendous change has happened in this area during the time I've worked on this guide, and I'll try and pull the curtain back so you can better understand what happens behind the scenes.

Throughout this guide after the end of various sections, we'll be embarking on app store expeditions where I'll be pointing out some fun and useful favourites in my collection. More details on these can be found at the end of this section. You'll be coming here pretty often, so we'll take a full tour of this digital marketplace. Give the App Store icon a one-finger double tap. Presto! You've arrived. Welcome to where you'll digitally equip your iOS device to do your bidding.

There are five tabs across the bottom of the screen. Double tap with one finger on a tab to move into the major area of the app store that the tab represents. When you first arrive in the app store after a reboot or because it's simply your first visit, you'll find yourself in the Today tab. To the right of this tab is the Games tab. Next is the Apps tab. To the right of the Apps tab is the Arcade tab. At the far right is the Search tab. Lets start our tour with a close look at each of these in

detail. Once that's done, we'll cover other things such as how to purchase apps, send or receive gifts, and manage your account.

The Today Tab

The first of the five tabs across the bottom is the Today tab. Think of it as a combination storefront and magazine about the latest apps and app developers. Apple seeks to let people know what kinds of brilliant apps and games are available that might ordinarily fall outside their areas of interest or inquiry. The problem is far more a curse for blind newcomers to iOS. However, it's a problem shared to some extent by sighted users who may not be able to imagine the tremendous possibilities offered by apps and their iOS devices. Nothing would please me more than to find a similar tab or a way to make the Today tab focus on apps that are fully accessible to blind users.

Each day, fresh content is added to the top of the Today tab. Just a few new items per day that usually include an app, a game, and an article of interest about a developer or interesting things happening in the world of apps in general.

You'll find the VoiceOver rotor very useful for navigating this section. Set it to Headings. The very top left corner has a heading of the current date. Next to that, you'll find the My

Account button. That's a very important button that deserves a detailed examination. We'll come back to it later in its own subsection. After that, flicking right takes you to today's articles if any, plus the featured app and game of the day. You can scroll down endlessly to the contents of prior days by having the rotor set to Headings and flicking downward. If no heading is reached via a downward flick, try flicking right once and then down again. This can sometimes let new content scroll into range. Alternatively, you can perform a three-finger flick upward to scroll quickly into entries from past days. A downward three-finger flick will move you forward in time towards the present day. Flick left and right to browse through articles within a day. Double tap on what interests you. This causes either an article or app's entry page in the store to come into focus. While reading an article, you can flick downwards with two fingers to have it read the whole thing continuously. Alternatively, you can flick right to advance paragraph by paragraph. There'll always be a Dismiss Article button at the top and bottom of it. Double tap this to get out of the article.

It can be interesting to read the articles here. Every once in a while, they might well discuss apps or games that are accessible to blind people. However, the majority of apps discussed here will be inaccessible. You may find something to

tell friends about who could make use of it. If you're feeling more proactive, you might want to contact the developer of apps that seem like they could be useful to blind people if they were made accessible. Let them know about VoiceOver, AppleVis, and so forth. Be polite. You never know what might happen.

The Games Tab

This is where you can find out about the latest games. There are thousands upon thousands of games in the app store. Sadly, the vast majority are unplayable without working eyeballs. People looking for games won't be inconvenienced by other apps. This tab focusses exclusively on games. Before, apps and games were in the same boat. This way, they each have their own territory. Flick right to advance through each item. Flick up and down to get to various headings marking sections of the tab. There are constantly updated charts of the top paid and free games, as well as information about notable updates and in-app purchases on offer. It's a very busy tab. Most games have videos available. However, the sound will be muted if VoiceOver is active unless you find and double tap the place near the top left where it says "Tap to Unmute".

There are an unbelievable number of games. This tab focusses on current content and content of exceptional quality. Sadly, the vast majority will be inaccessible for blind players.

People with some vision may find some games of interest depending on their abilities, but I can't recommend this as a good way to learn about accessible games for totally blind people. That said, it's a handy way to find out about current games to tell sighted friends and family about. If you start at the bottom and work left, you can find Redeem Gift and Send Gift buttons.

As awareness of potential blind and disabled customers grows, I'm hopeful that browsing this tab for something new to play might offer higher chances of finding something enjoyable for blind people.

The Apps Tab

Almost exactly like the Games tab in layout and functionality, the Apps tab focusses on apps that aren't games. As before, there are top charts, featured apps, and other major sections that can be navigated between via the rotor set to Headings. Here, I think there's more of a chance to come across something useful to blind people. It's more likely with apps where the focus isn't quite as purely visual. Many banks have made their apps accessible. Other task-related things like writing apps, calendars, etc., have also been made accessible. There's still markedly less awareness with game developers that there are potential blind players out there. You wouldn't

believe the number of people I've run into over my life who are flat out amazed that we can use computers with actual physical keyboards. Some of them have been so ignorant as to be thunderstruck that I can know where my mouth was and actually direct food into it at the end of a fork. I wish I was joking there, but I'm not.

Thanks to advocacy and regulations, there's a higher chance that practical apps provided by companies and institutions serving the greater public will be made in an accessible fashion. My bank has an app available for its customers that is fully accessible to me. To keep on track, I use an app called Fantastical, which combines functions of calendar and reminder apps into one. This app started out being accidentally and only partially accessible. However, when the developer was made aware of interest in his app from the blind community, he made it fully supportive of VoiceOver and a very friendly user experience. You might just find something useful by keeping a regular watch on the contents of the Apps tab. The odds of this occurring are markedly better for regular apps as opposed to games.

I would still urge caution. Before buying an app that sounds useful, check the app description by double tapping on the app's name and examining its page in the store. You'll find

most developers will tell you if the app supports VoiceOver or is accessible to blind people if they're actually aware that it is. Also, check on the AppleVis site, as they have reviews and entries in their app directory about apps known to be accessible or inaccessible.

Making Use of the Games and Apps Tabs

Browsing is really what these tabs are all about. While the focus is on the popular and new and notable, these tabs offer more than is immediately apparent. First of all, around the headings, you'll often find See All buttons. Double-tap on those with one finger to be taken into whatever the heading says the subsection is about. You might, for example, find a longer list of new and notable apps or ones which are part of a curated collection. One such collection might be holiday-themed games. The organization of content is very similar in both tabs, changing slightly as new apps are featured. It's quite easy to navigate. In both these tabs, you can narrow down by finding the Top Categories heading and double tapping the See All button. That lets you enter a specific category of app or game that you're particularly interested in. There will always be a Back button at the top left, so you'll never get stuck no matter how deeply you drill down.

Going into categories can be very useful, since you can then look through a smaller fraction of similar apps to see if any interest you or are accessible. For instance, during National Novel Writing Month, they had a section in the Apps tab about writing apps. These included the Ulysses app that I am now using. There are also alternatives like Scrivener, Bear, and others. Many of these apps are actually accessible to blind people. It's a good idea to poke around every now and then to see if anything useful might appear in a category or collection that interests you. Don't worry about getting stuck. You'll always find a Back button in the top left of the screen that will get you back up from where you've drilled down. You're never stuck anywhere.

The Arcade Tab

One of the most talked about additions to iOS 13 was the Apple Arcade subscription service. In a nutshell, this offers a growing selection of high quality, curated games to subscribers for a low monthly fee. People can play any game in the arcade provided they keep paying the subscription fee. This provides game developers with a more stable economic platform, as they receive a portion of subscription money based on how popular their games are. Apple may also invest in the game developers up front, so the end result is a higher quality game for their

arcade. Unlike other games in the app store, all games found in Apple Arcade are free of advertising and don't have in-app purchases. This frees developers from the need to find ways to generate money within the game.

Theoretically, this would make for an excellent venue for developing experiences that cater to everyone. Many accessible games have disappeared from the app store, because it became too economically impractical to continue to develop and support them. Provided the game concepts appealed to a large enough group, the Apple Arcade business model could help games have a longer run. The catch is that there would need to be enough games accessible to blind people to make the subscription fee worth paying. There are over a hundred high quality games for people with sight and average hand-eye coordination. This pretty much guarantees that the average person would find enough games that appealed to his or her interests to make the subscription fee worth paying.

Over the longer term, I think there's certainly potential for accessible experiences to emerge in the Apple Arcade. A growing awareness of accessibility is spreading among game developers and players. Gamers with disabilities are beginning to make themselves heard. Many friends and families of people who have disabilities want more ways to have fun that don't

leave them out. While I don't believe Apple Arcade will feature accessible content in the near term, I'll keep an ear open for any accessible games that may appear among the service's offerings.

The Search Tab

Way over on the far right, you'll come across the SEARCH tab. As tabs go, it's both blessedly simple and absolutely vital to forging your iOS device into the modern equivalent of a Swiss army knife that it ought to become. As a blind user, you'll be using this tab a whole lot to find and obtain apps you hear about. Rather than ploughing through the other tabs, it's far more likely that you'll be listening to a podcast like AppleVis or Blind Abilities. Some guest of the week will talk about a great new game. Dice World and King of Dragon Pass spring instantly to my mind. You want the game, so you double tap the Search tab on the bottom right corner. This brings up the search area.

Move your finger over the top of the screen and you'll find the search field. VoiceOver will say "app store search field. Double tap to edit". Once you do this, you will be in the search field and can type in the name of the app or as close to it as you know. Next, double tap the Search button at the bottom right to conduct a search. Touch near the top left of the screen and

flick right over the results of the search until you hear the correct entry. The most likely results to be relevant will be nearer to the top left. Double tap on any that interest you to get to that app's page in the store. There'll always be a Back button at the top left to get back to the main search screen. If, instead of typing something in, you flick right while in Edit mode, you'll come to a list of recent searches and suggestions that you can double tap if interested.

While in editing mode, the whole screen is focused on your entry. The Search button in the bottom right should be used once you're satisfied with your entry. If you're not in the search field, you can find a heading called Trending, which shows you what other people are searching for the most at the moment. This can at times inform you of apps you didn't know about. I almost never check, but it's there if you like.

There's nothing more to say about the Search tab. It's easy to use, nicely uncluttered, and your best means of finding apps you've heard about in other places. I tend to look on AppleVis or keep an ear on blindness-related podcasts to discover useful apps. The Search tab usually gets me to the app I'm interested in pretty quickly. It's always a good idea to double tap on the app title to make certain you're buying or downloading the right app. Nothing stops apps from having similar names. Go into the

app entry and read the description until you hear something that makes you certain you've got the right one. I try to remember the name of the app developer, which is always listed right after the app title.

The Quick Links Heading

There's a heading called Quick Links, which is the very last heading in the Apps tab as well as other tabs. Beneath this heading, you'll find a series of links addressing special needs, collections, and also important store policies. It's a good idea to look through the contents of these links. Double tap them to go to the area indicated. For instance, there are links explaining in-app purchases and parental controls, etc. There are also links to curated collections of "Apps with VoiceOver" and "Apps for Accessibility". Have a good look through both these collections. I wish they were updated a bit more often, but they're growing slowly and have a good selection of apps to get people started. I usually go to the Quick Links heading while in the apps tab, as that seems to offer more. Sadly, there is no Quick Links in the Games tab leading to a curated collection of accessible games. You'll find them lumped in with the "accessible apps" and "apps supporting VoiceOver" links found in the Apps tab. This is one area where I believe Apple could and should do better.

The My Account Button

This handy little button found at the top of tabs in the app store and other apps gives you access to your Apple account. Presuming you didn't skip any steps as you set up your iOS device, you've created an Apple ID, and therefore have an account. This button takes you to where you can manage that account. It is also possible to get to the same place via the Settings app. However, the My Account button brings up a series of additional options such as sending and redeeming gifts, signing out, and getting at your purchased content if you want to get hold of an app you previously deleted. The Purchased button lets you review and redownload apps if you need to do this. You'll also find buttons to send and redeem gifts, plus a button that has your email address as its label. That gets you to your full account where you can manage and change payment methods, addresses, and other things. You can also access this from the Settings app and in other store apps like Apple Books and iTunes.

A very important option here is called "subscriptions". App store economics are changing. Rather than a one-time fee, developers are more frequently offering subscription plans so that they can maintain their creations while keeping afloat financially. You will likely wish to subscribe to one or more

apps in addition to any services offered by Apple you find attractive. The Subscriptions button takes you to where you can manage these subscriptions. For instance, you can cancel any active subscriptions. You can also change to a different subscription plan if developers or service providers make more than one plan available.

Updates for Apps

Once you acquire an app, you are free to download and install it onto your device. However, the story doesn't quite end there. Apps receive updates over time that can improve their functionality and keep them useful as the iOS operating system on which they run changes. Some people simply elect to have updates come to their devices automatically and never bother to find out what has been changed. This leaves them potentially unaware of drastic improvements or design changes to how the apps they use function. Even if you choose to have updates download automatically, I would still recommend visiting the My Account area where information on all of the most recent updates to apps you've acquired can be found.

At the top left of the Today tab, you'll find a My Account button. Double tap this and flick right past all of the options discussed above. Alternatively, you can turn the rotor to Headings and flick down to where you'll either find a heading

called Recent Updates or Available Updates. This may also be called Pending Updates if you choose to have updates download and install automatically. There will also be an Update All button before the list of pending updates that you can flick through. Double tap on that button to update everything possible. Otherwise, you can flick right to hear which apps have updates waiting. After each flick onto an app title, wait a moment and you'll hear details of the latest changes in the update to the app. Sometimes, this brief listing doesn't include every little thing. However, it will make certain you're informed about any big changes or improvements. Double tap on the individual Update buttons found after the description of the particular updates you want, and they'll be downloaded and installed immediately. This may be especially useful when you're not on WiFi but still want certain updates right away even at the cost of cellular data.

The only two headings you'll ever find in this tab are the Pending Updates section discussed above and another heading called Recently Updated. Below this heading, you'll find a sequential list of every update you've received, which can scroll farther back in time endlessly. To check for new updates, pull down with three fingers while on the list of recent updates. Presuming you've scrolled upward as far as possible,

you should hear part or all of the word "refreshing". The Pending Updates heading and any new updates will then appear at the top of the screen. Don't forget that you are also able to have the latest updates download automatically. That option can be found in the Settings app.

Quite often, developers have merely fixed a bunch of bugs in their code and made other changes too small to be noticed by most users. In those cases, you'll find a short phrase where you might have hoped for something more substantial. That's such a common experience that it's often joked about. Many developers such as the gleeful bunch who make the Transit app, go to the other extreme. People look forward to a laugh from them whenever they update their app. Nothing really governs what goes into update descriptions other than some sense of overall decency, which has so far prevailed. As your collection of apps grows, it's well worth dropping in and checking the "updates" area at least once a week. That way, you'll be well informed and can be the one to clue your friends in about exciting changes.

Purchases, Subscriptions, and Gifts

Let's get down to the nitty gritty. Apps and other digital goods may not take up any physical space or weigh anything, but they still took labour to produce and will likely cost money. Whether they do or not, you will have to go through the same

purchase procedure to obtain them. This makes certain that the person who owns and Apple ID approves the addition of a given free book, app, movie, or other digital good to his or her account. This prevents anybody from doing things like installing potentially malicious third-party apps or adding an unwanted track to your Apple Music library.

The app store allows you to easily pay for the apps you want to give as gifts or use yourself. Once you have set up an Apple ID and connected a credit card in the payment section of your account information, you merely have to double tap on the Get button if the app is free, or the button that gives the price of the app. After that, you'll need to prove that you are the owner of the Apple ID. This can be done by using the password associated with the Apple ID. Regardless of the method you prefer, using the password will always be necessary for the first purchase you make after rebooting your device. It will also be necessary after a long period of around forty-eight hours where you haven't made any purchases. Other than those sorts of occasions, people will find it far more convenient to use Touch or Face ID, which greatly speeds up the purchasing process. You simply need to look at your device in the case of Face ID or touch the Home button on devices with Touch ID to verify you're the correct person. At this point, the purchase

will occur. With Face ID, you will need to double click the Action button on the side of your device while looking at it to complete the purchase. In normal circumstances, the app or other digital good you have purchased will download automatically into your device. In any case, even if you have set automatic downloading not to occur, a record is kept of your purchase or approval, and you will be able to download the app or other digital good when it is convenient for you to do so. You never need to purchase anything more than once unless you lose your Apple ID and cannot verify to Apple's satisfaction that you're you.

If you're purchasing a subscription to an app or making an in-app purchase, you'll use the exact same method to pay as I described above. Any ongoing subscriptions can be managed in the My Account area reached with the button given that name near the top left of the Today tab. You cannot receive a refund for any subscription or in-app purchase you have made. However, if you cancel before the end of a free trial period, you won't be charged. Also, if you cancel a subscription prior to when your payment is due, you won't be charged any further. Any benefits you've been paying a subscription for will simply stop being available to you when the current subscription period expires.

Developers who charge subscriptions or offer in-app purchases must do so overtly. You will find explanations of anything on offer in the descriptions of apps in the app store.

Through the app store, it is possible for you to both give and receive gifts. Let's say you've found a great new game that you think your friend would very much appreciate but might not be able to afford. You can pay for and send your friend his or her own copy of the game. All he or she would then have to do would be to accept your gift. Rather than a specific app, you may also send electronic gift cards to people so that they can then use that money as they see fit.

Redeeming gifts is also quite simple to do. These include digital gifts described above that others send you, as well as physical gift cards. This means that Sending gifts is a little more complex. You should take your time. You can go through the form filling in and selecting appropriate information. I don't usually bother with selecting themes. Also, you may find editing your gift's message to be a bit tricky. However, other than that, things are quite painless and easy to do with VoiceOver. Redeeming gifts is quite simple also. You can use the camera on your device to redeem any gift cards you might get over the holidays. The Redeem Gifts button will launch a series of instructions to help you do it. If you can't get the camera

method to work, you can enter the gift code manually if necessary. Electronic gift cards usually have links to redeem them, but again, you can always cut and paste the code into the box to manually enter codes. You'll get the hang of it in no time.

Reflections on the App Store

As an owner of one of these devices, I can say unequivocally that you do yourself a criminal disservice if you fail to take advantage of the app store and limit yourself to the small collection of apps that come installed on your device. I cringe when I hear about people who are so afraid of shopping online that they fail to even create an Apple ID or get set up to make purchases. It would be like moving into a large house or apartment and then, for fear of being robbed, failing to furnish it, living in just the bathroom. It's very much worth your while to explore the app store and see if there's an app that will help you do something more easily or entertain you.

Go into this exploration being aware that not all apps are accessible. These devices are designed primarily for people who have sight. Hence, their flat screens. The vast majority of games and other apps really require eyesight to use. However, when you're dealing with hundreds of thousands of apps, even having only ten percent of apps fully accessible still makes for

something on the order of thirty thousand useable pieces of software. I'm being quite conservative with these numbers. I'm a pretty heavy computer user, but I don't believe I've ever heard of anybody owning anywhere near that many programs. I have around two to three hundred apps with around eighty of them being accessible games.

Due to the high likelihood of finding an inaccessible app, I always recommend that blind users try to learn about an app before purchasing it. Read reviews of the app as well as its description. If you come across a mention that an app supports VoiceOver, it's at least going to be useable for you. Before spending money on an app, it's a good idea to see if there's an entry about it in the app directories at www.applevis.com. This website has become the best place to go for guidance and information, especially for blind people making use of Apple products. It's well worth checking out thoroughly. In particular, there are directories with descriptions and reviews of apps. You will also find podcasts that demonstrate apps in audio form so you can hear what it's like to use them. Do your homework, and you'll avoid disappointment.

Your device can either be an occasionally used expensive paperweight, or it can grow into the most handy and affordable piece of accessible technology you've ever owned. After nearly a

decade of using an iPhone, I've reached the point where I've found the best apps to do all manner of things. I don't even carry a laptop anymore when I travel. I simply take a small bag of accessories and my iPhone. The heaviest thing in the bag is a battery that could recharge my gear many times over and keep me going for around a week if necessary. I have reached this point through learning about and acquiring apps. These are typically far cheaper than similar software on my Windows laptop. Combine that with stupendously useful stuff like Voice Dream Scanner for reading print and BlindSquare for getting around, and you begin to see the possibilities for people on lower incomes. It simply doesn't get more portable, affordable and powerful.

Another thing that the app store makes easier is contacting the developers of apps. As people gain confidence in using VoiceOver, they may start experimenting with buying apps that sound like they should be accessible. This is how many happy discoveries of apps that are quite accidentally useable or nearly useable by blind people have been made. In many cases, developers simply need to be contacted and made aware of the need or desire for their app to be made accessible, and they'll find a way to do it. King of Dragon Pass is a splendid example of how this can happen. Sadly, other less complex games that could have been accessible are not, since their developers were

unaware of the potential market of blind users. Be polite and make your case. You might just do a big favour for thousands of people.

What to Expect with App Store Expeditions

As I've pointed out earlier, there are a staggeringly large number of apps available in the app store. A growing but relatively small proportion of these apps are accessible to blind users. This can be especially discouraging for beginners who go looking for useful apps, only to find ones that interest them but prove unusable without sight. Compounding the problem further, there is no way to limit one's search to apps that are known to work with VoiceOver. Sadly, spreading the word about apps that are accessible requires that app developers know where to put such information. Awareness of the AppleVis community and other online venues frequented by blind people is certainly not widespread among the general population. Often, developers might not be aware that their apps are partially or even completely accessible.

These circumstances can leave newcomers feeling overwhelmed and discouraged from exploring. To help get beginners started on a better more positive footing while they're learning how things work, I have included app store expeditions that appear at the end of many sections in this guide. In these small excursions,

you will find descriptions and notes about apps that have impressed me and/or the blind community of iOS users at large. The apps in each expedition will bear some relevance to the section that precedes the expedition. Often, app developers come up with very creative and useful alternative apps to what Apple includes with iOS. I hope these expeditions serve to make people more aware of possibly better choices for their particular needs. In some cases such as the section about games, an app store expedition would be redundant, since iOS doesn't ship with any games installed. You'll need to make use of the app store to obtain any games at all. Expeditions will appear after sections where this is appropriate.

In these expeditions, I won't be going over apps in great depth. I want to encourage beginners to try learning apps that interest them, feeling the confidence and joy that comes with such mastery. This way, if they decide to try more unfamiliar apps, they will have practiced their exploratory skills with apps already known to work well for blind people. I hope that this might lead to them persisting with newly discovered apps leading to more favourable experiences. If apps serve as particularly good examples to illustrate a concept, they will be discussed in the appropriate section. Also, in cases like GPS navigation, iOS may only come with one app that addresses a

particular need. In such cases, the more popular third-party apps will be discussed in the appropriate section rather than in an app store expedition.

Hopefully, these expeditions will also be of use to more experienced users who might find out about apps they were previously unaware of. iOS devices are a major technology investment for people. This is especially true if they're living on a lower fixed income as all too many blind people around the world are. The more various uses these devices can be put to, the better this investment will prove to be. I have gained a substantive amount of independence through trying apps rather than presuming they would be inaccessible. They have let me manage my Internet and cable services on my own, shop for groceries without sighted assistance, do my banking, and many more things. Some disappointment is frankly inevitable. However, if an app could make a real difference in your life, I hope these expeditions serve to illustrate why it's worth trying and perhaps contacting a developer to encourage him or her to make an inaccessible app more friendly to VoiceOver users.

What is This: Identifying Objects, People, and More with Apps and the Camera in Your iOS Device

Having been totally blind all my life, I've often scoffed at that saying about a picture being worth a thousand words. To me, pictures meant information I simply couldn't access independently. They were what prematurely ended great conversations at family gatherings when someone with sight felt the need to interrupt proceedings and position people for those magical memory moments I could never see. The last thing I ever expected to have any use for was the camera on my iPhone. However, thanks to some very innovative and clever apps, the cameras built into your iOS device can open up incredible possibilities for blind people. In fact, they have turned out to be as valuable to me as any other hardware that Apple has seen fit to include.

When I help someone learn about technology, I always look for something to show them that is simple and helps them pursue their own actual current interests. This gives them an answer to that ongoing question of why they should bother learning about their technology. It gives them something beneficial that they will actually want to start using between my opportunities to teach them more. It has to be something easy to do that doesn't demand perfection or a lot of practice before fun is had or

useful results happen. The more I thought about it, the more obvious it became that the place to start people exploring in this way was indeed the camera.

A camera on its own isn't very helpful to someone who can't see what they're taking pictures of. However, the magic happens when you use that camera in conjunction with other capabilities present in your iOS device. Connection is the key here. The right app will let you ask artificial intelligence built into your device about what your camera sees. Suddenly, it becomes possible to identify objects or read print on pages or signs without any sighted help. Other apps make it easy to send video or pictures to sighted people who can describe what they are seeing and tell you where to point your camera so that its viewpoint is optimally useful. Particularly with smaller iOS devices like iPhones that fit in a pocket and are held in one hand, these implications are truly revolutionary. In this section, we'll explore what the front and rear cameras can do for you when combined with apps already on your device or obtained from the app store.

There are now two distinct generations of these apps. The first generation app developers really deserve credit for figuring out how to use the capabilities of iOS devices plus human and artificial intelligence to do the extremely helpful

and clever things in service of blind users. I'll tell you about these apps plus the mind-blowing experiences I had with them to provide you with some context. These apps are still available in the app store and still have their uses in certain situations. However, the second generation apps discussed later in their appropriate subsections are typically far less expensive and perform better in most circumstances. I would recommend these second generation apps in most cases.

The FaceTime App: Borrow the Eyeballs of Family and Friends

Although there are many apps allowing for video communication, Apple has continuously developed FaceTime, and it therefore has no generation. It comes free with your device and is a part of iOS. This was the app that first showed me how very useful the camera in my iPhone could be.

I reached into my pocket ... and it wasn't there!

Handkerchiefs are splendid things to have handy when you need to wipe off messy fingers so you can then use your iPhone without getting guck all over it. They have made my day more bearable on many occasions. They are also most unbelievably frustrating objects to try finding once dropped. They make no sound at all when landing on apartment carpet or even hard floor for that matter. I had been given a dozen handkerchiefs and slowly lost most of them over the past six or seven years. At least, this

time around, I was pretty certain that the handkerchief was lost somewhere in the apartment. Perhaps, I had gotten my keys or another object from the same pocket and it had made its silent escape. I couldn't be certain how many days ago it had fallen from my pocket, though, so that meant it could have been in any number of places.

There are, of course, time-tested methods for dealing with searching for dropped objects. The grid pattern search is the most thorough and laborious. I resigned myself to goodness knows how many minutes or hours of crawling around my apartment floor doing such a search. And then ... it dawned on me.

Around the time I got my first iPhone, my father had gotten an iPad. We had chatted using the FaceTime app, which used the camera on the front of an iOS device to let people see each other's faces while talking. I remembered that I could switch it so it used the rear-facing camera. Rather than fruitlessly crawling around the floor searching, I called my father on FaceTime. He began telling me where to point the camera so he could see the apartment floor and furniture where it could have fallen. It literally took him no more than a couple of minutes to look over the floor through my phone's camera and tell me where to reach down and retrieve the handkerchief. He didn't even have to leave his living room to help with finding stuff or

reading printed documents. A few times, he even helped me restore my obstinately silent computer to working status by telling me where to point the camera and what was on the screen.

Finding my lost handkerchief was my first mind-blowing experience of how very useful the tiny camera in the corner of my iPhone could be to blind people. Over time, it became habit to FaceTime my father whenever I needed his eyes for tasks requiring working eyes. You can learn all about how to use the FaceTime app in the section called Reaching Out. For now, though, just remember that once you've started a call, feel the screen and find the button that lets you switch cameras. The rear camera will give a far better view of your surroundings, since that is its actual purpose.

Object Identification

Sadly, not all blind people have sighted friends or family in their lives who are so willing to lend their eyes when needed. There are also times when, for instance, due to the lateness of the hour, it would be inadvisable to call upon one's friends to quickly find out what kind of cake you pull from the fridge to partake in a midnight snack of which they may not approve. Being able to have the benefits of sight for crucial moments here and there without inconveniencing people has always been a strongly held desire among blind people. Tapping into the

capabilities built into your iOS device, app developers have now largely made this dream a reality.

TapTapSee

<https://taptapseeapp.com>

Rather than using a bar code, which can be hard to find on some objects, the app assists blind people in taking a good enough picture of the object to allow artificial intelligence or a human assistant to identify the object. The user is then informed, usually within seconds of taking the picture, what the object is. This app detects when an object is clearly in focus and emits a short beep to inform the blind person of such. You must go into the More tab and then double tap the Settings button to access the configuration area of this app where this feature can be enabled. This can help tremendously if people have never had occasion to take a picture before. TapTapSee can also analyze up to ten seconds of video to identify objects in the camera view.

TapTapSee was king of the proverbial block for quite some time. It was once a paid service where you had to keep restocking the number of pictures you could have described for you. It has long since become free for all users to use as much as they like, and still comes in handy every now and then. The little beep made when an object is in focus makes this app

easier for beginners to use, and its free price made it a natural if somewhat dated first choice.

For my wife Sara and I, TapTapSee was well worth paying for photos while that was actually necessary. To just be able to pull out one's phone, snap a picture of a bottle of beer, box of crackers, or cup of noodles and find out what kind it was within seconds, that was absolute unadulterated magic. No longer was it necessary to label so many things that would only be used once. No longer did we have to be so very careful about where we put which soup cans. Provided we had our iPhones, we could make informed choices without having to open something to find out what it was.

Reading Print

Another common barrier to blind people having equal access to information is that much of it is in print. Everything from mail in your mailbox to notices and signs in places you inhabit are presented in letters impossible for blind people to absorb unassisted even if they happen to feel a sign or paper, thereby finding out that the information exists. Having a portable talking device equipped with a built-in camera, you might think that apps naturally came quickly along that would do this. However, for quite some time, Apple was very cautious about how much control it allowed apps to have over the camera. As a

result, achieving good optical character recognition or OCR as it's called for short, was very tricky, especially if people couldn't see to focus the camera well enough. Like so many things in iOS, the gradual opening up of such control presented possibilities that eventually resulted in an absolute triumph for blind people.

KNFB Reader: A Reading Revolution in Your Pocket

<https://knfbreader.com>

My second truly mind-blowing experience with the camera on my iPhone happened on September 18, 2014, on the same day as the Scottish referendum. Thanks to the generosity of John Morgan, a philanthropist who I've had the honour and good fortune to call friend, I felt able to afford the most expensive app I've ever acquired. for quite a while, I had been hearing about a remarkable new app called KNFB Reader. An early demonstration of its capabilities involved someone taking a picture of a screen at the front of a large auditorium and having the print on the screen read out perfectly. This app could also help guide your hand as you positioned your iPhone above a sheet of paper to get that optimum shot for best recognition results. It was one of those things that felt either too good to be true or too revolutionary and life-changing to be available to ordinary people like me. However, the National Federation of the Blind

was willing to fund the development of the app, teaming up with the legendary Ray Kurzweil who pioneered optical character recognition in service of blind people.

I was using an iPhone 5S by this point, so I had the capability to run it. People were almost too ecstatic about what it could do. I heard stories of people effortlessly photographing even large poster-sized documents and getting nearly perfect OCR results. People talked of snapping pictures of signs on the street and learning what they said. It all sounded too good to be true. The price of over \$130 Canadian certainly gave me pause. I could buy a good portion of a month's groceries or a lot of Kindle books with that sort of money. I would, in all likelihood, have ultimately made the purchase. However, what decided me that day was an email and donation from John Morgan. He had heard of this remarkable app and wondered if I'd be interested in taking it for a spin and telling him what I thought of it. Naturally, at that point, I agreed. I purchased the app from the app store without difficulty, and it installed without any issues.

I opened the app and read through the included instructions. For an experienced user like me, or even a beginner, it all struck me as very simple and well thought through. I could use a feature called "field of view report" to

get a sense of how well a document was in the camera's focus. Once I had gotten it in good position, I could take a picture, and the document in focus would be read out to me. This would apparently happen within seconds of my taking the picture. Testing it out on some smaller flyers I had gotten in the mail, I happily found that the app was as good and easy to use as people said it was.

To really put my new app through the wringer, I found a large poster-sized paper that the Ontario government had sent me. I had used my older version of Kurzweil 1000 and the OCR scanner on my desk to partially scan the document. It wouldn't all fit in the scanner, but I had gotten enough read out to know it wasn't something I needed to wrestle with to hear the rest. However, if this new app worked like people had raved about, it wouldn't be nearly so hard and time consuming to get the full document readable.

I laid out the large sheet on my dining room table and made certain the room light was on. For once, it would actually be helpful to me, allowing the camera to take a better picture. Ordinarily, my apartment lights remained off, barring the presence of the occasional sighted visitors I had. Using the field of view feature as well as vibrations that gave me a sense of how tilted my iPhone was, it took a number of attempts before

I found a position that let the camera take in the whole paper. Moving my iPhone farther above the paper and then getting another report, I was able to hone in on the perfect position for my iPhone. I knew I had found it when a field report told me that all four edges of the document were visible. Then, I carefully double tapped the Take Picture button. The camera sound played, and I waited, hoping I hadn't disturbed the position of the iPhone by tapping too hard. Since then, they made it possible to use the Volume Up button to take a picture, which is far less likely to jiggle your device. It took around ten seconds. I was just beginning to wonder if I had managed to crash the app when a synthetic voice began reading the document. Not just part of it. All of it!

The contents were about as deadly dull and unimportant to my life as humanly possible. Nevertheless, I was still absolutely spellbound. The paper was read out absolutely perfectly. I had never read anything like this without there being a number of OCR recognition errors. You'd encounter them at least once every couple of sentences. There'd be nonsense characters or letters instead of numbers. It had been this way since my days in secondary school when I had gotten my very first scanner. That still certainly happens even with KNFB Reader, but it's a lot less frequent. However, on that day, the

stars must have been right. I stood there at the table utterly amazed waiting for a mistake that never came, as perfect sentence followed perfect sentence.

I couldn't help but think back to the weekend I had spent scanning a copy of *The Elements of Style* so I'd have it in time for my creative writing class in university. A good portion of my perhaps slightly unfair seething hatred of that book can be traced back to the wrecked weekend of effort it took to get a far from perfect but useable copy scanned into my laptop one page at a time. How much easier and less painful it would have been with an app like KNFB Reader.

The implications for today's students are absolutely profound. It might actually be useful for them to go to a library, borrow a book, and find the information they needed in it. They could read through forms and merely need sighted help to fill them in properly. All of the work of character recognition happens on your own device. This means that your data is kept absolutely private and doesn't need to travel anywhere for processing. You can also export the text to other apps and share documents when you want to. The vibration feedback plus the field of view report feature, make the process of learning to take good pictures of sheets a lot easier to master than with apps that cost less. Also, every element of the

app has been designed from day one with blind users in mind. Due to this, it may still be worth its price in some cases.

Compared to other apps in the app store, KNFB Reader is one of the most expensive purchases you're likely to make even if you manage to get it while on sale. However, consider this more carefully. I needed government funding to obtain the Kurzweil 1000 software I had been using for over a decade. Each time I wanted to get the latest update, I needed to pay over \$100 to have it sent to me. The government agency spent over \$1,000 initially to purchase my user license for the software. However, for the cost of a single update for Kurzweil 1000, I had gotten an app that consistently yielded results as good as or better than Kurzweil 1000. These results were obtained in a fraction of the time that the software and scanner took to even scan a sheet, let alone interpret what it saw. Rather than a bulky scanner taking up desk space, I could pull my iPhone out of my pocket and read print anywhere. I've never had to pay once for updates to the KNFB Reader app. They just keep coming every so often.

Prizmo 5: A Cheaper Alternative Reading Solution

<https://creaceed.com/iprizmo>

While KNFB Reader was certainly the first really noteworthy print reading app, it wasn't the only kid on the block for very

long. Other apps appeared attempting to offer OCR capabilities more affordably. These days, unlike when I picked up the app, KNFB Reader has some good competition. By far, the most successful of these is one called Prizmo. It was designed to cater more to the sighted user. However, Creaceed SPRL, the app developer, took great care to incorporate support for VoiceOver and special guidance to help blind users orient their cameras to get good pictures of text. You can try the app free of charge enough to get a sense of whether the app would suit your needs. Should you need more of its capabilities, you can purchase some capabilities outright such as the ability to export and share text. Other capabilities take advantage of Cloud-based processing to offer enhanced accuracy above and beyond the already superb performance of the built-in OCR capabilities. Prizmo also offers language translation capabilities. If you hesitate to pay an ongoing subscription, you can instead pay for a limited amount of Cloud-enhanced accurate scans and/or translations. Otherwise, simply pay a one-time fee to unlock the exporting and on-device scanning capabilities of Prizmo, and you'll have yourself a very robust and portable OCR solution.

This illustrates the power of large-scale economics. While you won't find quite the same level of intuitiveness as with KNFB Reader, Prizmo offers very comparable OCR results for

people who are comfortable and proficient with using the camera of their device. The "Scene Description" button at the bottom right offers similar guidance to the "field of view" report feature of KNFB Reader. It also gives a sense of the number of lines of text in view. As you move the phone, lining up the document, Prizmo will try to instruct you how to move your hand to optimize what the camera captures when you ultimately take the picture. There are VoiceOver hints throughout the app, as well as other help offered in the app's Settings button found at the top left. For a lot of people who feel comfortable using the camera, Prizmo will be more than sufficient to meet their OCR needs and will cost them a whole lot less money. For others, the more intuitive feedback and guidance that only an app designed from the ground up for blind users will be well worth the extra one-time expense. For me, apps like Prizmo and Voice Dream Scanner have well and truly eclipsed KNFB Reader as far as my own needs go. What once felt magical now feels a natural part of the everyday. Living in an era where blind people can now regularly make such choices between specialized apps built specifically for them or comparable cheaper (and at times better) apps built for everyone still feels truly magical.

Voice Dream Scanner: Affordable Easy Print Recognition

Wouldn't you know it? Almost immediately after I finished writing this section in early 2019, another brilliantly simple and very affordable OCR scanning app appeared on the scene. Winston Chen, the developer of the various Voice Dream apps, has brought us yet another inexpensive masterpiece. Voice Dream Scanner is designed to work along with Voice Dream Reader, and you can therefore use any extra text to speech voices you purchased for other Voice Dream products. The app can be used alone or from within Voice Dream Reader at your choice.

For the cost of \$5.99 US, you can purchase an app that gives often superior results to KNFB Reader. Currently, it cannot decolumnize pages in books like KNFB Reader can. However, if what you're interested in scanning are single sheets at a time, this app is the way to go. It does everything on your device with no need for Cloud services. Just hold your device above print on a sheet, box, or anywhere else, and listen for a fairly quiet long tone. This tells you that the edges of a page or printed text in the camera's view have been detected. The louder the tone, the more text is in the camera's focus. Double tap on the Capture Image or Image Preview button, and the text will be interpreted. You can choose via toggle buttons whether

text is then spoken automatically and whether a picture is taken automatically when the camera is in a good position.

You can keep or discard scans and share results with apps like Voice Dream Reader, Dropbox, or pretty much any app that can use text. There are no additional costs or anything. Making an excellent addition to other Voice Dream products and an excellent standalone purchase, Voice Dream Scanner definitely makes the list of "must have" apps. No Cloud-based artificial intelligence is used, so anybody concerned with privacy can rest easy. It all happens using the artificial intelligence present on your own device.

Seeing AI: Putting it all Together

www.seeingai.com

To really propel things forward takes a partnership. This partnership is between blind people, who own iOS devices and need to know about things in their lives, and a gigantic globe-spanning company working on cutting edge artificial intelligence with mind-boggling resources. One summer, the blind community was absolutely stunned when the Seeing AI app from Microsoft appeared in the app store. As a means of conducting ongoing research into accessibility and artificial intelligence, Microsoft had managed to leverage its artificial intelligence, massive image database, and computing power to come up with what

is still the current "must have" app for blind people. It's called Seeing AI. This app is the Swiss army knife of handy tools making use of the camera. It has a number of channels that each perform different tasks. The channel you start on is for reading short text as the camera sees it. Touch the channel selector in the bottom right and flick up or down to get to other channels. More channels are added as new features are deemed ready for public experimentation. Other available channels currently include ones for reading larger documents, identifying objects or people, identifying currency, detecting the level of ambient light, describing scenes, and even reading handwriting. Some of these features are still in what is called "preview" status, which basically means they're available for you to try but are not yet judged fully developed. This app is available free from the app store, and using it is free of any charges other than possibly cellular data.

It's impossible to properly convey the tremendous usefulness of the Seeing AI app, or the impact on the social media-using blind community be overstated. All through the first months during which the app was available, it seemed that there were torrents of tweets, Facebook posts, and podcasts about this small but monumental app. Nothing could knock Seeing AI off of the five most recently recommended app slots on the AppleVis

home page. And this, despite the fact that users in the UK weren't initially included. The envy from across the pond was thick enough to cut.

When you first run the app, you are presented with tutorials that pop up as you explore. They have videos produced by the app developers at Microsoft, which explain how the various features work. Once you've gone through those, the app will open into the default channel for reading short text. Touch the channel selector on the bottom right and flick up or down with one finger to change to different channels. The next two channels above short text reading are for reading whole pages and product identification via bar codes.

Keep in mind that Seeing AI is a research project. Basically, this means that you're paying for the assistance you receive with the data you're generating. You are the product. As Microsoft's artificial intelligence assists you by reading text or describing people or objects, it learns from the images. Human app developers working on Seeing AI and other Microsoft products might make use of the image of a coffee cup you take a picture of and have described to improve the ability of products using artificial intelligence to recognize coffee cups. A blind person might well have taken a picture of a coffee cup from a different unusual angle than most images in an image library. I

feel pretty safe in using it for most things but wouldn't use it to get the security number of my credit card or anything sensitive like that. Always be aware of where images and data are going and be mindful of the motivations of people or companies who have access to it.

Speaking of being aware of who gets data, consider the case of Lorna, my mother in law. Soon after my wife Sara and I began using the Seeing AI app, we visited with her family and showed them the app. With her eager permission, we decided to try the person description channel and take a picture of Lorna. Being fully sighted, she had seen herself in the mirror or pictures many times. She could give us an idea how good the app was doing at describing people. Sadly, tact and the preservation of life aren't things that the artificial intelligence in the Seeing AI app seems to consider when giving its opinions. Perhaps, it felt safe and snug deep inside Microsoft out of reach of who it studied. Upon examining that picture, my iPhone calmly informed her that she was a good couple of decades older than her actual age. She was less than thrilled with that description and jokingly warned me not to leave my iPhone unattended in her presence.

Envision: A Smaller Team with a Different Approach

The Envision AI app tries to leverage artificial intelligence to provide a similar one-stop shop of functions to help blind people. Though similar in purpose to Seeing AI, it uses different Cloud-based artificial intelligence. This team is supported by blind and visually impaired people rather than serving the initiatives of a larger company. The app is constantly being improved. Users pay a subscription fee of around \$5 per month. Other plans are also available, and you start with a fourteen-day trial. For any Latin-based languages like English, you can recognize text offline using OCR and artificial intelligence in your device. While online, it can recognize up to 60 different languages. It is able to read handwriting.

This app has an impressive array of features including object and person detection. You can tell it what you're looking for, wave your device around and receive tactile and audible feedback giving you a sense of where the kind of object you want is. This also applies to people whose faces you have trained Envision to recognize.

Double tapping on a button such as the Scan Barcode button activates that scanner, and you hear a short couple of rising tones indicating that it's scanning. Double tap the button again

to stop looking for that particular thing. The app is very intuitive and easy to explore. Whether the ongoing cost is worth paying rather than using freely available apps like Seeing AI is something you'll need to determine for yourself. There are a number of similar apps in the app store that each come at the same goal in a slightly different way.

The Eyes Have It: Bringing Willing Sighted Help Where it's Needed

Let's face it. There are times when no amount of fancy artificial intelligence will do the trick. You need to hunt for something, complete a process, figure out where to write on a form, etc. There are problems that require an ongoing dialogue with a sighted person to be solved efficiently. With FaceTime, you must have someone in your family or circle of friends willing to help when needed. Not everyone has an iOS device. Nor are the sighted people in our lives always free or knowledgeable enough to help. There are currently a number of apps that seek to remove these limitations. We'll focus on two very popular apps that attempt to connect those who need sighted help with people who are willing and able to assist.

Be My Eyes

www.bemyeyes.com

The Be My Eyes app connects you via a video call similar to FaceTime with the first available volunteer who has made him or herself available to assist. The app shows the volunteer what the camera on the back of your device sees. The real utility in the Be My Eyes app is its ability to connect people needing help with available volunteers who have time to offer assistance at any given moment. This is great for finding lost objects or picking out clothes that look good on you.

Keep in mind that these are volunteers. All they have to do is complete a simple tutorial about how the app works. They aren't vetted for security and are unpaid. Don't use them for anything requiring sensitive information. While it is unlikely that people would volunteer with sinister motives, You never know. Someone could, for instance, see and make use of a credit card number you had the volunteer read to you. There are certainly ways in which this app and the blind people who use it might be abused by unscrupulous people.

To write this section of the guide, I wanted to test out the Be My Eyes app for myself. I found signing up to be very easy. You do need to agree to the terms of use and use the app in abidance with those terms. Volunteers are never responsible for your safety. Nor can the developers of Be My Eyes be held liable for any misuse of the app. Once I had signed up, I placed

a call by finding and double tapping a button called CALL First Available Volunteer. I have a collector's coin that I got after participating in a documentary called Get Lamp. It's available on YouTube and is about text adventure games. I asked the volunteer to describe each side of the coin. She did a nice job of it and told me how to move my iPhone so she could read me the small writing on the coin as well as describe the pictures. She had time for a brief chat and was curious about the documentary. I asked what she had to do to volunteer, and she described the simple tutorial she had completed.

The experience was very simple and unhurried. However, one is certainly conscious of taking up a volunteer's time. Personally, I wouldn't want to use them for anything too lengthy. That call certainly gave me an idea of the ability of the camera on my iPhone 7 to focus on small images and what feels to me like tiny writing on the coin faces.

Aira: Competent Secure Sighted Help on Demand

www.aira.io

Aira, pronounced "eye ra", puts everything on a business footing. Aira hires agents who help blind people with everyday tasks. These people are vetted for security, so you can feel safer about sensitive information. Also, you as a blind client, pay a subscription for a certain number of minutes each month.

You can use them for whatever you like without feeling guilty for taking up somebody's time. The software used by Aira agents is more sophisticated and allows them to pull up maps or tap into your social media to recognize faces of people. Aira agents are trusted with your data due to their having been vetted for security, and this makes Aira potentially much more useful depending on your individual needs. Aira can be used in conjunction with smart glasses, giving a head-level, hands-free view more similar to eyesight to Aira agents. Imagine walking down a street and a voice in your ear telling you about a restaurant sign coming up ahead. The agent could also tell you that your friend John is approaching you from the left. That's what happens in one of the promotional videos you'll find on their website. Because these agents can access your location and other information, they can help you make travel decisions. During the setup process, Aira makes it very clear that they aren't responsible for your safety. They won't help you while you're travelling unless you are using a mobility aid like a guide dog or cane. They can, however, describe your surroundings and suggest different routes. They could tell you about signs of businesses you're passing, where a taxi stand or bus stop is, or any number of details that might prove useful. They could help

you operate an otherwise inaccessible ticket machine or read information from a restaurant's display.

While writing this guide, Aira offered a free trial for everyone, which gave you thirty minutes that had to be used in seven days or less once your trial started. I took advantage of this to take Aira for a casual spin. Some of my thirty minutes were taken with going through the rules and answering some questions to set up my profile. This process is called "onboarding". Its purpose is to make certain people are clear on acceptable use and that Aira agents aren't responsible for your safety. The process has since been streamlined and should take less than the five minutes that it took me.

The agent asked what she could help me with. In advertising the trial, people were encouraged to knock something off their bucket list. During the years I've lived in my apartment, I had often been told that I had a "good view" from my balcony. I decided to have the agent who took my call describe for me the view from the balcony of my apartment. I figured this would give me an idea of how wide an area could be seen from my iPhone's camera, as well as a sense of how well Aira trained its agents in the art of description. She spent a few minutes describing what she saw and answering some questions I asked. I was impressed by how much could be seen and with the detailed

description I was given. She agreed to type up some descriptive text and attach it to a picture she took and shared with my iPhone. Unfortunately, the notes she quickly typed weren't at all equal to the in-depth description she gave. However, I got an idea of what it was like to stand and look out on a snowy afternoon from my balcony.

As things currently stand, using the Aira service for calls that don't exceed five minutes is free for everyone, provided you're in a country covered by Aira. This policy was launched in the later summer of 2019 and has radically affected how useful the service is to people even if they can't pay for a monthly subscription plan. We all have moments where it would be ever so useful to borrow a pair of trusted eyes for five minutes while travelling or around the home. The hope is that using the Aira service in this way will cause people to want more extensive time and pay for subscription plans. Theoretically, a person could simply call back when five minutes was up. People certainly do this, but they then have to start with a different agent to finish whatever they needed help with. Also, Aira will encourage people who abuse their generosity excessively to sign up for a subscription. Given the accountability inherent in the Aira platform, I don't doubt they could take steps to prevent

the stupidity or greed of some people from damaging the quality and timeliness of service available to everyone else.

There is an introductory subscription plan that gives thirty minutes for around \$30 US. When combined with the free initial five minutes of any call, this would potentially be quite useful. Also, those who are seeking jobs or are present in Aira-supported businesses and locations, can also use Aira free of charge without losing minutes. This further enhances the usefulness of Aira to non-paying blind people. Beyond this introductory plan, higher tiers of Aira subscription giving hours of uninterrupted available time with sighted Aira agents is an expense your bank account will feel the sting of even for people with steady working incomes. As of March 2019, a standard subscription without smart glasses would cost around \$100 US per month, giving you 120 minutes of Aira time that can be used for nearly anything you want to do with the assistance of an Aira agent. This doesn't cover any costs you'd pay for the cellular data used. Those could be prohibitive if you don't have a high or unlimited amount of data in your monthly plan.

Putting things on a business footing has a more profound psychological effect than you might think. While you might hesitate to use a volunteer's time for anything lengthy or complex, the mindset changes when you're paying for a service.

As fate would have it, a friend of mine posted a perfect example of this on Facebook while I was working on this section of the guide. Michelle McQuigge doesn't consider herself particularly handy with tools or good at assembling things. However, she had bought a heavy-duty laundry cart and decided to use an Aira agent's help to try assembling the cart without help from her more mechanically inclined sighted friends. The agent was able to find the assembly instructions on the Internet and then talk Michelle through the process of putting her new cart together. That just floored me. I can't count the times in life where I've sat still or stood out of the way while someone sighted has tired him or herself out putting some piece of furniture together for me. An experience common to blind people is that sense of being more than willing to do the work for oneself if a sighted person would just patiently say what needed to be done and where things were. For Michelle, Aira made that dream come true.

The idea of attending an event and being able to get to your seat or know what's around at a festival independently is very compelling. You could tour a convention hall or have paintings in a gallery describe to you. Aira really pushes this active and engaged lifestyle in its advertising. While the introductory plan plus five minutes here and there might be

useful for a few quick tasks around the home, you wouldn't want to go on a day-long expedition with that plan. Attending a convention or exploring a setting, you'd want more time available. Aira certainly hopes so and appears to be getting its wish, as enough people are subscribing to make things viable, along with fees from business and other locations where Aira is free for any visitors to use. Early 2020 has seen a group of investors partner with Aira. It's still very early days, and questions abound over whether this will result in any substantive changes to how Aira expands and how affordably it offers service.

Camera Conclusions

Over the past eight years, I've continued to be delighted by the many ways in which the camera in my iPhone has proved a vital part of my everyday life. As the costs of artificial intelligence, computing power, internet connectivity, and camera technology go down, the possibilities for even those of us on low incomes will continue to grow. Thankfully, ways are being found to tap willing people and the vast resources of companies to improve lives not only of blind people, but of everyone who gains from artificial intelligence.

These are still very early days. Things are moving quite quickly. This section of the guide may very well be the first to

become obsolete due to changes in this area. I'm fascinated to see where both the charitable and business efforts to put the cameras on iOS devices in the service of improving the lives of blind people end up going over the next decade. Both Be My Eyes and Aira are doing all they can to increase awareness and reach of their services. To find out more, you may wish to subscribe and listen to the podcasts offered by each of these major players. Currently in early 2020, you can hear the Aira Cast, which offers everything from news and interviews with Aira staff and clients to recorded events experienced through Aira. Meanwhile, Be My Eyes has two podcasts. The Be My Eyes podcast is similar in many respects to the Aira Cast. The latest podcast from them is called Thirteen Letters, which discusses accessibility more broadly with experts in many areas who are interviewed about their work making life more inclusive for people with disabilities.

The current situation with COVID-19 has seen both Aira and Be My Eyes step up to help blind people, continuing to bring sight to where it's needed, while the owners of these working eyes remain safe in distant locations. I've read a great many positive and thankful tweets regarding both of these services over the past while. It's pretty safe to say that both will come out with drastically increased public awareness of the

tremendously helpful role their agents and volunteers have taken on.

There's quite a lot of potential for amazing helpful ideas. What really excites me is how all of this is done through a piece of technology commonly used by all sorts of people be they blind, sighted, disabled in other ways, or fully able-bodied. This brings large scale economics to bear on problems that formerly relied on smaller niche markets and special charity or government economics. That in itself is a massive game changer, whose implications are still very much in their infancy.

Sadly, I think there is some cause for worry about an increased divide between blind people who succeed in finding steady enough employment to tap into what paid services like Aira offer and those who aren't as successful. On lower income levels, you quickly hit a Catch-22 where you spend so much on the service that you have no money to go places to put it to the more spectacular use that their advertising pushes. However, I think the costs will fall over time as more businesses join as sponsors or partners. I'm also hopeful that these services will have a trickle-down effect through changing public attitudes about the possibilities for blind participation in spheres of life.

The fear surrounding what governments and massive corporations will do with the data we generate is still, I believe, a limiting force on what's possible. Personally, I think a lot of that fear is misplaced. People aren't really weighing up the benefits and hesitate to reach for the ready help that artificial intelligence can provide. For blind people, I see more of a danger from the one-on-one connections between them and the sighted people they connect to. It's far more likely that an unscrupulous person would take advantage of a bank account number accidentally revealed while trying to bring a package of oatmeal on a cluttered countertop into focus or something of that nature. In such a case though, is that very slight risk more or less dangerous than not knowing whether that package of oatmeal contains ingredients you're allergic to? Might it be worth trusting a volunteer or paid agent to help you use that otherwise inaccessible vending machine to get a snack or pay for a ticket you need in a hurry? In exchange for a bit of mindful sensible trust, that help is now available through your iOS device.

Above my discussion of each app covered in this section, you'll find a link to the website about it. There are all kinds of podcasts, videos, and other information for each app so you can get a sense of whether it suits your particular needs. A

simple Google search can yield more independent reviews and demonstrations of these apps. People tend to talk a lot about things that have positive impacts on their lives. Take advantage of that to get a good sense of what's possible and how you might use that little round camera in the corner of your iOS device.

Remember to think out of the box. Nothing stops you as a blind person from using the camera for the same social purposes as a sighted person. From pictures posted to online dating sites to Facebook photos, blind people are getting up to all kinds of social activity. There are even blind YouTube stars who have lots of sighted followers. We'll cover that in greater detail in the section dealing with social media. There are lots of implications for making friends and sharing experiences with that little camera and other technology in your iOS device. New possibilities are emerging all the time, so keep an ear out for them.

Ready to Help: Siri is Your Digital Assistant

With VoiceOver, Voice Control and Siri all having to do with speech and the use of voice, there is a danger of confusion about which feature does what things. Failure to understand the very different purposes of these tools can lead to frustration and dissatisfaction particularly for newcomers to all this. Before we discuss the most widely used and famous of these features, lets be absolutely clear with our terms.

VoiceOver is a screen reader that provides feedback via Braille, sound, and synthetic speech output. It also offers a set of special gestures to make control of the touchscreen possible for blind users. Contents and control elements that would normally be seen are spoken out loud or turned into Braille for the benefit of blind users. This feature is covered in its own major section earlier in this guide.

Voice Control is about input. It allows users to fully control their iOS device through their own voice. You'll find that another section covers this feature in detail. For now, just realize that it provides an interface for controlling your device much like what you can do using a touchscreen. People speak certain commands and are able to select and activate elements or dictate text without needing to touch their screens. Voice Control doesn't verbally output anything on its own to let

potential blind users know what has happened. That task falls to VoiceOver. Voice Control wasn't initially conceived of with blind users in mind. It was primarily designed for people with vision but who had other disabilities preventing them from using touchscreens. However, it is possible to use VoiceOver in conjunction with Voice Control while using AirPods or headsets.

Siri is what is popularly known as a "digital assistant". It is a system that employs human talent and expertise combined with powerful Cloud-connected, artificial intelligence. This artificial intelligence can tap into and search the staggering wealth of information on the Internet as well as in other databases maintained by Apple and others. This Cloud-based system combines with the increasingly robust artificial intelligence housed locally in all iOS devices. All of these resources work in concert to seamlessly provide many different capabilities through a friendly conversational interface. Collectively, these capabilities are what is known as a digital assistant.

Anyone who has a relatively modern iOS device can freely make use of this service whenever and wherever they wish. There are other digital assistants such as Google Assistant and Amazon's Alexa. Both of these are available for your iOS device as apps that you can obtain free of charge from the app store.

All of them work similarly to each other, but their capabilities and areas of strength differ.

In its effort to sell products, Apple presents Siri as an extremely polished and superbly capable entity that smoothly does what people say, and answers questions concisely and brilliantly. You need not look hard on Google or YouTube to find out that the reality often falls hilariously short of this portrayal. The better you understand the intentions behind Siri, the less prone to frustration at its limitations I think you'll be. There are two books I'll point you to that contain excellent and informative information on voice computing, digital assistants, and Siri itself. James Vlahos's book *Talk to Me: How Voice Computing Will Transform The Way We Live, Work and Think*, is a very approachable and extensive discussion of the artificial and human thinking behind Siri and the extent of current capabilities of voice computing in general. In particular, read the section titled "Assistants". Meanwhile, Brian Merchant's book *The One Device: The Secret History of the iPhone*, gives us a detailed look at the materials and ideas contained in your iOS device. The entire book is well worth the read and absolutely fascinated me. However, if you're interested in Siri particularly, I direct you to Chapter 10 titled *Hey Siri*.

When people talk to Siri to ask it a question, they usually get a spoken answer or find that Siri makes a call or does what they ask. Visually, a window appears on the screen that contains Siri's response. Often, this window contains more than is actually spoken aloud. Small wonder then that many uninformed sighted people presume that you can do absolutely everything these devices are capable of using only your voice. Such complete control simply isn't what Siri offers. Siri is designed to help accomplish a wide variety of basic tasks in addition to performing searches for answers to inquiries. People are still expected to make use of the touchscreen to dig deeper into information or complete more complex tasks. It's not unlike the handy little multitool I wear daily on my belt. I can't use it to build an entire house, but it'll do some of the lighter tasks in such an enterprise.

The major role Siri is meant for is to find information online to provide answers to your spoken inquiries. These answers are spoken and also displayed on the touchscreen of your device. If, in answer to a question, Siri calls up a website having what it thinks is useful information, this website isn't always read out in full but is displayed on the touchscreen. To dig deeper, users can activate links displayed in such websites.

Siri is designed to be more verbose in circumstances where the user is likely not able to look at the screen such as while driving. In most circumstances, having absolutely everything read out would potentially annoy sighted users. It therefore typically won't do so beyond a fairly concise answer to an inquiry. Thanks to VoiceOver, blind people can also read websites offered up by Siri, taking full advantage of what is found. Using Siri, I can ask my iPhone to play a song, dictate an email or tweet, or perform other simple tasks. Quite often, only one or two exchanges with Siri are sufficient to send a message, create an appointment in the calendar, record a note, etc.

There is a real danger of overestimating Siri's capabilities. Apple encourages people to try asking Siri anything at all. The worst that will happen is that Siri won't understand your question or be able to do something you tell it to. You must still actually do the heavy lifting using apps and other tools. It won't do your homework or write a master's thesis that you could then merely hand in.

When answering questions, Siri typically provides quick and concise spoken answers compared to other digital assistants. Let's suppose I ask Siri to look up lizards on Wikipedia. If I'm lucky, as I was with this inquiry, Siri will read me a small

portion of the Wikipedia entry on lizards and ask if I want to hear more. Other times, though, it simply says "I found something on the web about Antigonish, Nova Scotia. Check it out.". It then proceeds to display a web page that will hopefully have what I'm after. Note that it doesn't read the page it found for me but merely puts it up on the screen. This can be helpful for sighted people, as there may be pictures or maps that they can take in at a glance, along with whatever text is present. For blind people, it's an absolute showstopper unless you have VoiceOver running. In conjunction with VoiceOver, Siri can be as incredibly useful to blind people as it is for those who can see. In fact, thanks to voice dictation, Siri can greatly lower the barrier faced by beginners who must learn enough about controlling the touchscreen to put their devices to more extensive use. For instance, a new blind owner of an iPhone may very well ask Siri to reply to a text message sent by a friend long before they master typing on the virtual keyboard.

Setting up Siri

Siri is now an integral component of the iOS operating system. Its artificial intelligence is constantly learning about you in the background so it can make better suggestions and do other things to make life easier. Unless you skip the part of

the setup process that deals with Siri, you will have prepared Siri as part of the setup process for your device. You would have been asked to train Siri to recognize your voice and asked to say a few phrases including the famous invocation "Hey Siri". This would allow Siri to listen for you to say "hey Siri" whenever you wished to invoke the assistant. This process also helps Siri to recognize and understand your particular voice better. I recommend that all blind users do this, since it does tend to reduce the chances of Siri waking up when other voices, such as the one which might well be reading this document to you, happen to include the words of summoning. It also increases Siri's ability to potentially understand you even in noisy environments.

As usual, what you do during setup isn't carved in stone. You can change a lot about Siri, including its voice gender, by going into the Settings app and into the Siri & Search area. As of iOS 12, the first thing you find in that area is about "shortcuts". We'll get to that advanced tool later. For now, turn the rotor to headings and flick downward until you get to Ask Siri. This is where you can choose whether you want Siri to listen for your voice. Alternatively, you might rather have things set so that you need to invoke Siri by holding down the Action or Home button. This eliminates the chance of Siri

activating because it thought you said ... those magic words. You may also choose to have Siri invoked by double tapping on an AirPods, pressing and holding in the button on the controls of EarPods, or using a button found on various Bluetooth headsets should you own and be using these. As of iOS 12, it is also possible to type to Siri rather than speaking your queries or commands. You can still invoke Siri with the Home or Action buttons, etc. Instead of listening for vocal input, an edit field will appear where you may type.

There are a number of settings that let you determine aspects of how Siri behaves. For one thing, you can choose whether or not Siri is available while your device is locked. You can also choose whether you want Siri's suggestions to appear when conducting searches and at other times. A setting called Voice Feedback should be set to "always" so that Siri will indeed speak information after every interaction. Sighted people can eliminate much of Siri's audio output by changing this so that it displays replies rather than speaking out loud.

The My Information setting is about making certain Siri knows who you are as the device owner. You can choose the entry in your contacts with your own name to give Siri any information about you in that contact. This lets Siri do things like send messages on your behalf, address you by your name, etc. Once

that's established, you can teach Siri about people who are important in your life and about their relationship with you. Later on, when you tell Siri to "call my wife" or "tell Uncle Bob I'll see you at lunch tomorrow", Siri will hopefully know who you mean.

Below these settings, you'll find a final heading called Siri Suggestions. Siri is able to make suggestions while you're using apps, using the keyboard, and when conducting searches on your device locally or on the Internet. You'll find a toggle on/off switch for each of these overall capabilities. Past those toggles, you'll find a list of apps that can each be toggled on or off to tell Siri whether or not you want it actively learning and making suggestions while you're using that particular app. This gives you complete control over when Siri is analyzing what you do in an effort to serve you better.

In terms of setting up Siri, this relatively small group of settings is all Apple currently thinks is necessary. Everything else you'll be doing with Siri will happen through the commands and inquiries you make using your voice or via typing. Remember that you do have a choice when it comes to Siri's voice. You can, at a minimum, choose between male and female voices available to your geographical region. You can also choose the accent of the voice for languages like English where there are a

wide variety of accents. The American female voice is a bit of a special case, as it's currently the only one to be generated on the fly using artificial intelligence. This allows it to sound more natural, particularly when speaking longer sentences. I could easily choose from British, Australian, Indian, and Irish male and female voices if I desired. The options here will doubtless grow over time as licensing and synthetic speech technology advances.

Commands and Inquiries

Invoking Siri is pretty simple as was outlined above. However, getting a good feel for what it's actually capable of doing for you is a bit more tricky. This is done by design as people are encouraged to try anything they can think of. Some of Siri's answers are written by clever writers who work hard to build a kind of personality for Siri, giving it friendly and often funny answers. Should you insult Siri either out of playful curiosity to see what happens or perhaps out of actual frustration with its limitations, it will have an appropriate and often amusing response. In reality, Siri is neither contrite nor hurt by your rudeness. It doesn't actually understand words, numbers, or anything else. Lacking consciousness, it also lacks contextual awareness about the real world that we, as living beings, take for granted. Conversation with artificial

intelligence is still a bit of a card trick. Human writers craft many of Siri's more fun or witty answers.

Make no mistake though. When you ask Siri a question or give it a command, you're tapping into something very powerful. Siri can and does search the Internet and other databases on your behalf for the information you request. It also understands numerous commands that let you control your device's more simple aspects. For instance, you can ask Siri to raise or lower the volume, turn on or off many features including Do Not Disturb and /or VoiceOver, tell you how much charge your device's battery has, or set alarms and timers.

I wouldn't consider my wife or I to be particularly heavy users of Siri. We're both pretty efficient at using the touchscreen and the gestures VoiceOver provides. However, over the course of a day, both of us use Siri for some tasks and answers. When I start a load of laundry going in the washing machine or dryer, I'll ask Siri to "set timer for 35 minutes". After it expires, I can go down to the laundry room to move the load into the dryer or retrieve it. While putting the laundry away, I might ask Siri to "Shuffle party playlist" or "Play AMI Audio" so I can listen to an interesting show or music. Rather than going into my extensive folder of games, I might ask Siri to "Launch Dice World" or any other app I might want to use.

While getting ready for a church meeting, I can use a Siri shortcut connecting it to my Ulysses app. By simply saying: "church", I can quickly be taken to that group of sheets within Ulysses so I can get at what I need more quickly via the touchscreen.

Siri can really come in handy for short tasks like this, especially while you're doing other things or on the move. I can simply say "Hey Siri", "What's the weather like?" as I open the haul closet and reach for my coat. Amid an argument with a friend, I might ask "Hey Siri", "When did President Ronald Reagan die?" and receive my answer. Since it's spoken out loud, my friend can hear it and know instantly that my answer was correct. While washing dishes, I can carry on a text message, dictate a note, or do many other things at the same time without needing my otherwise busy hands. There are all sorts of situations where Siri can come in handy like that from doing quick calculations to finding out where you are.

At its core, Siri is really about connections. When you ask a question, it might search a number of different sources online to find the answer its prior experience with similar inquiries made by you and others cause its programming to predict you're after. When you ask it to play a radio station, it connects to and searches multiple directories of online broadcast feeds to

find the station you want. Through Siri shortcuts, which are discussed in the subsection below this one, app developers can further increase Siri's utility by creating connective interfaces with their apps. This would let users of a ride-sharing service like Uber or Lift simply ask Siri to order them a car. using another Siri shortcut, they could order dinner at a restaurant that ride would take them to. As more data is gathered and more apps become connected with Siri, its capabilities and usefulness will continuously improve.

Here are some thoughts on being a good boss for Siri. When speaking to Siri, I've found that it helps to speak clearly and strongly. Think of the voices of radio and television broadcasters you've heard. Don't imitate their voices. Speak in your own voice, since Siri will constantly train on recognizing it whenever you use the digital assistant. Think more about the clear commanding style professional speakers you've heard tend to have and try to adopt it. Also, be as precise about whatever you ask or order as you can. Think about any ambiguities your command might contain. For instance, I might say "play CHUM FM" to hear a favourite Toronto radio station. This will likely work but I've had occasions where it has been misunderstood. Saying "Play one O four point five CHUM FM", on the other hand, has worked each and every time I've tried it. Remember that Siri

doesn't really understand context. It searches for matches and learns patterns. You're pretty much bound to be misunderstood at some point. If and when that happens, take a deep breath and try again.

Shortcuts

A very powerful addition to Siri's capabilities, Shortcuts let you say a short phrase or even a single word to Siri and have one or more events happen as a result. It has allowed app developers to equip their apps in ways never before possible, tying them directly into Siri. This means that an app like Uber can accept a ride request complete with address without requiring the prospective rider to actually enter the Uber app. A restaurant could have its app feature a Siri shortcut that initiates a brief conversation with a customer to book a table or order a meal. This is still a relatively new capability that developers are eagerly exploring the full potential of. Apple gains from this as these shortcuts dramatically increase the utility of Siri.

So far, I've been using shortcuts that have been created for apps. This doesn't even begin to approach the full potential of shortcuts. To delve deeper, you'll need to use the Shortcuts app. This app is now installed with iOS and is fully accessible to VoiceOver users. This is where you can create shortcuts. It

is also where you can alter and remove shortcuts you may no longer require.

We'll take a brief tour of this app below. However, I would advise anybody who plans on creating shortcuts to make use of Apple's own user guide to Shortcuts and the Shortcuts app. You can find this by going to <https://support.apple.com/en-ca/guide/shortcuts/welcome/ios>.

The Shortcuts app grew out of a previously award-winning app called Workflow. It caused quite a stir on AppleVis, because one of the awards it received was due to its being made fully accessible to blind people. The app creators made it possible for actions to be chained together easily using VoiceOver. This made it possible to automate all sorts of tasks. Apple eventually acquired the Workflow app and integrated it into what has become known as Shortcuts today.

There are three tabs across the bottom of this app. On the far left is My Shortcuts. This tab is where any shortcuts you create and any shortcuts you choose for personal use from the gallery are kept ready. In the centre is the Automation tab. This is where you'll deal with shortcuts that trigger when certain conditions happen. For instance, you might have a shortcut that turns on your smart appliances and lights when you arrive at your home. The tab on the far right is the Gallery

tab. This is where you'll find a constantly growing library of shortcuts developed by app creators as well as other users. You can create shortcuts in the My Shortcuts tab and make them available in the gallery for others to use and adapt.

My Shortcuts

This tab is where all of the shortcuts you create or have chosen to use are stored. At the very top of this tab, you'll find an Edit button that lets you arrange the shortcuts as you desire. You can also remove shortcuts you no longer want. Next to this is a Create Shortcut button. This takes you to the shortcut creation area. After this point, you'll find a heading called My Shortcuts followed by a list of all shortcuts you create or select from the gallery for personal use.

As in other apps, you are able to make use of the actions rotor. Flicking down on a shortcut in the list will cycle between options. You can rename, duplicate, delete, edit, and activate the shortcut currently in focus. These actions are self-explanatory. You may want to duplicate a shortcut if you then want to edit one of the copies to turn it into a similar shortcut.

Automation

This is where you create shortcuts that respond automatically to conditions. You'll find two buttons awaiting

you here. The first lets you deal with personal automations. These would be for running on your own device. The other button lets you set up home automations for use by everyone in your home. They will be active on the device you choose to use as a home hub. I have absolutely no experience with these kinds of shortcuts. Therefore, I will simply refer people wanting to use this tab to the link I provided above to the Apple user guide on shortcuts.

Gallery

This is the place to discover new shortcuts created by others. It is a very full and busy tab that thankfully makes use of buttons and headings to help navigate and keep things organized. The first element you come to at the top is a search field. Type key words related to the kind of shortcut you hope to find, and you might strike gold. Next to that search field, you'll find a series of buttons leading to specific kinds of shortcuts. One of these is "shortcuts for accessibility". These buttons are useful for filtering the constantly growing collection of different shortcuts.

Past those buttons, you come to the first of a series of sections separated by headings. The first heading is Suggested Automations. The next one down is Shortcuts From Your Apps. Don't forget to check for buttons near the headings or at the

end of sections just before the next heading; they may lead to other categories.

When you find a shortcut you're interested in, double tap on it. You can then flick to the right and go over all of the parts that make up that shortcut, which includes the phrase used to activate the shortcut via Siri. You will be able to flick over the actions that the shortcut will perform when activated. Also, you can choose to add the shortcut to Siri, which puts it in My Shortcuts.

Creating Shortcuts

The Create Shortcut button found at the top of the My Shortcuts tab is what you want to double tap to get started. You can then name your shortcut and add actions to it.

The user guide from Apple referenced earlier in this section will contain the most up to date instructions for creating shortcuts. You may also find one or more useful books at www.nbp.org. In particular, I would direct you to the books by Anna Dresner. One of her many helpful offerings is Getting The Job Done With Shortcuts: An Introduction For Blind Users.

App Store Expedition: Going Beyond Siri

Google Assistant and Amazon Alexa

There are other digital assistants out there. The two most notable are both available free in the app store. They are

Google Assistant and Amazon Alexa. I would encourage everyone to download these apps so they can take full advantage of the services and capabilities offered by these tools. Each assistant has different key strengths due to the philosophy and desires of the companies behind them.

The real strength of the Google assistant is how well it answers general questions. In my experience, it offers better spoken answers to more questions. Siri often only reads you part of what it finds, leaving you to feel around the screen using VoiceOver to hear the rest of what it has discovered for you. Google, on the other hand, seems to speak more complete answers to questions, so you don't then need to use VoiceOver most of the time. Only when its answer proves inadequate will you then need to feel for any additional links it may display but not have spoken aloud.

Meanwhile, Amazon Alexa does reasonably well with answering general questions. However, its real strength lies in the skills that it lets you access. Skills are Amazon's equivalent of apps. There are literally thousands of them with more appearing all the time. Everything from games and skills that let you control smart appliances are available using the Amazon Alexa app. Basically, you can have all of the same capabilities that one of Amazon's smart speakers would give you right on your iOS device.

All of these assistants are evolving constantly. You never know when a new game or other capability will emerge that you may find useful or interesting. it costs you nothing to have these apps on your iOS device and create accounts with these services. You may as well have them handy.

Carrying a Great Many Tunes: Apple Music and the iTunes Store

Your iOS device is a wonderful and accessible way to explore and enjoy music. I've been adding to my collection ever since I got my iPhone 4. The ability to carry around enough music to last days without even coming close to filling the memory onboard your device has been a powerful attraction. Apple has its own proprietary music file format, and you can't just fill your device with MP3 files unless you get an app that can handle them. Again, it's a case of convenience versus cost. If you buy into Apple's ecosystem, I think you'll find that music is an area where Apple treats its customers handsomely.

There are two ways to get music from Apple for your iOS devices. It is delivered in a format especially designed to sound good on iOS devices. You can either buy music on iTunes, which is yours to keep, or subscribe to the Apple Music service. This gives you access to over 30 million songs, curated playlists, and many other benefits provided that you pay a monthly subscription. If you don't pay, you lose access to any music collected that you haven't bought from iTunes. These options are not mutually exclusive. You can own iTunes music and still subscribe to Apple Music without forfeiting anything. We'll look at the merits of each option in this section.

The iTunes Marketplace

The iTunes Store app gives you the ability to purchase music as well as movies and TV shows. You can also rent movies. Many now have audio description. Look right after the title and rating for images that are announced by VoiceOver to make certain a movie or show has closed captioning and/or audio description. Have plenty of storage space, as movies are quite large. Songs and albums comprise only sound and take far less space. Records are kept of all purchases made so you can remove content from your device and redownload it as needed. Everything is tied to your Apple ID. Remember it and your password always. Use the Music and Search tabs found across the bottom of the iTunes Store app to find and purchase desired albums or songs. In the iTunes & App store settings found in the Settings app, you can customize whether you want to use cellular data when downloading new purchases. Also, you can choose which kinds of purchases to download automatically when you make them. Also, you'll see whether you've set touch ID to be able to authorize purchases or whether you must simply use your password all the time. It's a good idea to look through those settings as well as the Touch ID & Password settings and be familiar with your options. If you have concerns about others accessing your device, you may prefer Touch ID so that your fingerprint can

authorize purchases, and people won't see you entering your password.

When you open the iTunes Store app, you default to the Music tab. It's at the far bottom left of the screen. At the top of the Music tab is an options area with Genre, Featured, Charts, and Item List buttons. The Item List is a wish list you can add to using the Share button in an item's entry. For instance, "share" an album and choose the Add to Item List button from the menu that appears. The iTunes store works just like the app store. Double click on an item title to go to that item's entry. Use the Back button at the top left to back up one level. Use the Get button or the button that shows the purchase price of an item of interest to obtain that item. You will be prompted to authorize the purchase by password or Touch ID.

You can also find spoken word material, which is treated the same as music on iTunes. The CBC or Canadian Broadcasting Corporation puts up many of their audio drama productions and popular radio series as albums for sale on iTunes. It really pays to search and explore. I've found some very good audio dramas made available through iTunes. If you have a computer, you can get iTunes software and authorize it to download and play content. This makes it possible to more physically back up what you have purchased if you wish.

The Music App

This app is how you play music purchased from Apple or available through Apple Music subscription. If you subscribe to Apple Music, this app will be all you need to enjoy, obtain, and manage music on your device. If you don't intend on using Apple Music, you'll still use the Music app for enjoying what you purchase from the iTunes store. Either way, you should go to the Music settings in the Settings app. We'll go over these later in this section.

Library

This is where music you have purchased or added to your collection resides, and where you can sort and manage it. There are buttons across the top, including Edit, Playlists, Artists, Albums, Songs, and Downloaded Music. These let you focus on the part of the collection that interests you. Pressing Downloaded Music reduces what is shown to only that music you've chosen to store on your device. Use this button when you're offline or don't want to use cellular data to stream music. Otherwise, any music you want to hear is simply grabbed and streamed for you. Competing with other priorities, the music on my device is slowly whittled down to what I most treasure.

Browse

This tab appears to the right of the For You tab and to the left of Radio. It lets you explore the gigantic collection of videos, interviews, extras, albums, and songs made available to Apple Music subscribers. It has all kinds of curated paths to help you get to the kind of music you want. Great for when you don't know specifically or can't remember artist or song names. This tab and the For You tab contain the expertise you invest in when subscribing to Apple Music. Knowing how to use the VoiceOver rotor is useful, since there are headings dividing what the Browse and For You tabs contain.

Radio

This tab will always have Beats 1 radio station, which is Apple's flagship music station featuring famous personalities and DJs. It streams 24-7 and has a wide variety of shows. Subscribing to Apple Music will grant access to a great many more specialized stations whose music is curated by experts plus Apple's artificial intelligence. Apple hires experts and famous people in the world of music to be DJs and produce special shows. Elton John is one such famous person who has long had an association with Apple. Past shows are also made available here, so you never need worry about missing out. In addition to regular shows, there are sometimes special events that can be

heard through the radio tab or watched as video elsewhere in the Apple Music app.

Search

This tab gives you the ability to search for artists or songs both inside your library or in the larger Apple Music collection. Double tap the edit field and type in what you want to look for. Note the buttons near the top that let you choose whether to look in your library or the entire Apple Music collection. Flick over the results and double tap on any that interest you. If it's a song or album, you'll be focussed in on that content. Use the Back button at the top left to get back to the broader search results.

The Now Playing Screen or Mini Player

This element of the app is crucial to your full enjoyment. While albums or other content is displayed, the mini player will be available right above the tabs at the bottom. It's easiest to touch the tabs and flick left, essentially moving up onto it. There are Pause and Skip buttons plus the title of the track you're hearing. Flicking left gets you to a place where you double tap to expand the player. This puts you in the Now Playing screen.

The Now Playing screen puts the focus on what you're listening to now. The tabs will be unavailable until you dismiss

the Now Playing screen. The button to do this is always on the top left. Next, there are Next, Previous and Pause buttons. You'll also find a handy volume slider, and Shuffle and Repeat buttons. Playback Destination lets you switch to other connected speakers, headphones, etc. Great for quickly sharing music if you have a Bluetooth speaker paired and turned on. Any artwork associated with the album or song is displayed. The More button is important and gives access to options to remove, download, or perform other actions like adding the song or album you're hearing directly to a playlist. I use the More button often when I want to remove tracks I don't currently want stored on my iPhone when they come up. This way, they just disappear but are still in my library in the Cloud should I ever want them again.

Music App Settings

There you'll find a setting to show or hide Apple Music. Switching this to "off" will remove many elements only of value to Apple Music subscribers so they don't clutter your experience. Also, you'll find some nice goodies like an EQ setting, volume limiter, and more. I like the Late Night and Lounge EQ settings while using my AirPods. However, other settings may be preferable when using AirPlay to play music on various Bluetooth speakers.

The Apple Music Service

This subscription service lets you access any music in Apple's vast collection of over 30 million songs. They offer many ways to do this including creating radio stations based on music you like on the fly, curated playlists and recommendations tailored to you specifically, and much more. You can store favourite albums and songs on your device so you're not streaming them using up data when you hear them. You can use an optimize music option to remove songs not played often from your device. It still remains a part of your library. As long as you pay the roughly \$10 per month charge, you have access to the music you want.

Taking this approach, you need not use the iTunes app at all. Everything is integrated into the Music app found on your device. The For You, Browse, Radio, and search tabs let you take advantage of the many aspects of the Apple Music service. This brings the number of tabs across the bottom of the Music app to five with Library at the far left and search at the far right. The Connect tab disappears and is incorporated into the contents of the For You tab.

You are buying access to the collection as well as expert guidance and curation performed both by people and by Apple's artificial intelligence. This system learns about you as you

listen, make choices, and react to what you hear. It doesn't observe you with sensors or anything. however, let's say you skip to the next song before the one you're hearing finishes. Apple's artificial intelligence might take this into account when deciding what songs it should recommend to you. You can also "love" or "dislike" songs you hear, which teaches Apple about your music preferences, further increasing the suitability of recommendations.

While working on this section, I decided to look in the Browse tab to take this expert curation for a real spin. I wanted music suitable for working to and very quickly came to a heading touting playlists of such music that was regularly updated by Apple's curators. I chose the Pure Focus playlist and have been quite happy with what I've heard for the past half hour. Here's another one. Each week, Apple Music comes up with a list of twenty-five songs that it thinks I'm likely to enjoy. More often than not, I've ended up adding songs and entire albums to my library based on its educated guesses. Apple's artificial intelligence and human editors have led me to discover a great deal of fabulous music, which I deeply appreciate.

There are also other perks such as special early releases, videos, and interviews by artists. Special events like album

releases and special shows happen from time to time. As I write this, a large-scale festival is apparently in the planning stages.

When unsubscribed, the Radio tab gives access to Beats 1, an Internet radio station broadcasting 24-7 with people like Elton John and other famous musicians providing programs. This is Internet radio with serious money put behind it. Subscribing to Apple music gives access to many more expertly run stations in that tab. Also, it is possible to create radio stations on the fly based on the song you're currently hearing. One of the options revealed by double tapping the More button in the music player is Create Station. Using this will instantly create a playlist featuring the artist you're hearing plus similar artists and songs. If you hear something that catches your interest, you can easily check out the artist and add songs or albums to your library.

New subscribers get a three-month trial before they must start paying.

Music App Settings

There are a number of settings specific to the Music app that can configure it to your liking. As in other areas, these settings are divided up into groups under headings. The topmost heading is Apple Music. The single setting immediately below is

Show Apple Music. If you plan only to use music you've purchased from iTunes, you can set this to "off", which declutters your app by removing everything that you must be a subscriber to Apple Music to use.

The next heading is Library. There are a few settings beneath this heading that concern whether songs are added and under what circumstances, whether changes made on your device are synced across all of your devices, and whether cellular data may be used to affect such syncing and changes.

The next heading is Downloads. Beneath this heading, you will find several settings to help manage how much music content is on your device taking up space. The first button displays how much capacity is taken up by music content on your device. Double tap it to enter an area where you can precisely edit this content, removing what you don't want at the moment. You'll next find an Optimize storage option that will allow you to set a minimum capacity level. For instance, you may decide to set it to 16 GB. As long as you have 16 GB or less of music content on your device, this will behave as normal. However, if your device gets full, songs that you don't listen to will be automatically removed to free up storage. The minimum level of 16 GB will be preserved so you'll know that at least this much music is available for offline listening. The last setting in this group

lets you decide whether music you add to playlists is automatically downloaded to be available for offline listening.

The next heading is Playback. I visit this group of settings often. This is where you can find the EQ setting that changes the acoustics of the music you hear to better suit the music or your circumstances and listening equipment. There are a wide range of different settings such as Piano, Electronic, Classical, Pop, etc. I like the one called late Night. It emphasizes the base and treble in music and works particularly well for me with my hearing loss. It can be mildly annoying to have to go into settings to change the EQ setting, but the results can be very much worth the bother.

There is also a Volume Limit setting. I don't use this, since it limits the maximum overall volume rather than just for music. However, this may be helpful in some circumstances. There is also a Sound Check setting. According to the user guide, this will help normalize the volume of music so you don't get potentially sharp startling differences between songs.

The last setting in this group has to do with whether Apple and others can see what you've played. Anybody can follow you and listen to what you're choosing to hear. Also, the data is used by Apple's artificial intelligence to make better recommendations to you. Having used Apple Music for over a year

now, I have to say that Apple's recommendations have proven to be excellent. I've certainly benefited from Apple's artificial intelligence and human curation.

Special Events

The Music app can also serve as a portal to stream special concerts and musical events. In earlier years of the past decade, I used to keenly look forward to what was then called the iTunes Festival. It was held during the summer or else right at the end of it. I would sit out on my balcony in the afternoon or evening and listen to whatever top talent band or artist happened to be on tap. If I missed a live performance, it would eventually be made available as a video to stream. The concerts were held live at the Roundhouse in London, England. Apple would do a marvellous job of streaming the performances. I was introduced to many bands and artists who I've kept up with over the years. One Direction, 7and5, and Passenger are three particular favourites. The very last of these festivals was used to introduce the Apple Music streaming service. It made for a wonderful introduction.

In more recent times, Apple had focussed on its Beats 1 radio station and would feature smaller scale live performances. I had begun to think the days of larger scale events were a thing of the past. However, this may have just changed. On April

18, 2020, the One World: Together at Home benefit concert was put on in hopes of raising money for the World Health Organization. Among many other options including radio and TV, you could hear it streamed live through Apple Music. I thought it was a splendidly executed event with performances from many artists packed into a couple of very enjoyable hours.

Final Thoughts

For people on tight budgets wanting a fully accessible way to enjoy music, Apple now offers an extremely compelling option with the Apple Music service. This is even more the case if your iOS device doesn't have much storage space. To take full advantage, you need a good WiFi or cellular data plan. This is vital if you're going to stream your music or listen to Internet radio stations. Provided you have that, you're pretty much good to go. Hardcore fans will appreciate the many extras like interviews with their favourite artists, curated playlists and collections, artist videos, etc. You'll never run out of new things to listen to. New albums, playlists, and more are added all the time. If you hear something cool while out and about, chances are you can add it to your personal library without paying anything beyond your subscription fee. Another nifty addition has to do with Siri. You can ask Siri to play the top songs of a time period, shuffle an album or playlist, add songs

or albums to your library, skip songs, and much more. It's like having your own personal DJ. If you don't recognize a song, you can ask Siri what it is. You can tell Siri to rate songs from one to five and tell it what you do and don't like. This improves songs selected for you and influences the contents of the For You tab.

I've come somewhat late to this music party. The whole idea of not owning what I liked discouraged me from subscribing to Apple Music earlier. There's a mind-blowing lot to explore. Blind people are completely on an equal footing. Everything is fully accessible using VoiceOver. Musically speaking, I couldn't be happier.

Cherished Pop Songs

Here is a selection of some of my current favourite songs. They're in no particular order. I just played my list of pop music on shuffle and added ones I particularly liked when they came up. They are all available on Apple Music. Be sure to check out the artist if you hear something you like. I only picked a single song from any particular artist, but most have done numerous songs that I enjoy very much.

"All This Time" — Patrick James

"Walk On The Moon" — Great Big Sea

"Jacob's Ladder" — Huey Lewis and the News

"Lost Boy" — Ruth B.

"Chances" — Five For Fighting
"Superheroes" — The Script
"Bus Stop" — Andreas Moe
"Home" — Daughtry
"Where I Stood" — Missy Higgins
"Coming of Age" — Foster The People
"Giving Away a Miracle" — Luba
"Piano Man" — Billy Joel
"Live Like There's No Tomorrow" — Selena Gomez
"Out of My Heart (Into Your Head)" — BBMak
"Something Just Like This" — The Chainsmokers
"Faithfully" — Peter Cetera
"Face in the Crowd" — Lionel Richie
"June" —Charlotte Orchard
"The Time of My Life" — David Cook
"The Movies" — Nightly
"What If" — Lene Marlin
"Young As The Morning, Old As The Sea" — Passenger
"Ran Away" — Hollow Coves
"I Will never Let You Down" — Rita Ora
"That Girl" — Christopher Cross
"Catch My Breath" — Kelly Clarkson
"Montreal" — Port Cities
"Problems" — A R I Z O N A
"It's Not Living (If It's Not With You)" — The 1975
"Tall Shadow" — Basia Bulat
"Devil in the Deep" — Abigail Lapell
"Song for a Winter's Night" — Gordon Lightfoot
"Live and Learn" — Men Without Hats
"Silver Road" — Sara Harmer

"Odds Are" — The Barenaked Ladies and the Persuasions

"Stockholm Syndrome" — One Direction

"Wisemen" — James Blunt

"Ordinary Day" — Vanessa Carlton

"The Wonder of it All" — Kristine W

"Don't Pay the Ferryman" — Chris De Burgh

"Wordplay" — Jason Mraz

"Haven't Met You Yet" — Michael Buble

"Thunder" — Jessie J

"Malibu" — Fly By Midnight

"Call Me Maybe" — Carly Rae Jepsen

"Shot At The Night" — The Killers

"Keeper of the Flame" — Martin Page

"Lullaby" — Nickelback

"Kiss Me You Fool" — Northern Pikes

"Galileo" — Indigo Girls

Cherished Modern Instrumental Music

Often, I like to hear instrumental music while I write. Over the years spent working on this guide, I've been delighted to discover many excellent modern instrumental tracks thanks to Apple Music. I've never really been a fan of older classical music. However, I've grown quite fond of piano pieces as this list illustrates. I've followed exactly the same procedure as I did creating the above list of songs. I've let my thousands of tracks of instrumental music play in shuffled order and written down the names of pieces that particularly struck me as deserving of inclusion. As before, I've limited artists to one

track each in the list. Most of them have produced numerous tracks that have inspired me and kept my spirits up.

"Salt" — Ben Cosgrove

"Destiny" — Onda Norte

"River Flows in You" — Yiruma

"Walking The Endless Mile" — Back to Earth

"Relax And Enjoy" — Louis Landon

"Looking Forward, Looking Backward" — Robin Bennich

"Concerning Hobbits" — Howard Shore

"Crest of a Wave" — Patrick Kelly

"Wherever You Are" — Greg Maroney

"Our Secret Place" — Luke Woodapple

"Little Love" — Michele McLaughlin

"On the Nature of Daylight" — Max Richter

"Feeling Good" — Lisa Hilton

"Hide And Seek" — Thomas James White

"Creativity" — Robin's Island Music

"A Little Closer" — Acoustic Alchemy

"Watchman's Ease" — Jeremy Soule

"The River" — Michael Logozar

"Arrival" — 7&5

"Sunset" — Michael Richard Plowman

"Cosmo" — Brock Hewitt

"Full Sail" — Ryan Farish

"Awaken" — Lynn Tredeau

"Appreciation" — John Adorney

"A Song for the Lonely" — Phil Rey

"The Return" — David Tolk

"Invisible Moment" — Apple & Stone

"Eternity Rising" — Sam Dillard
"Knighting Ceremony" — Bill Brown
"Ride Through The Fields" — Erdenstern
"Wandering" — Jacob's Piano
"Beginnings" — Sean Redmond
"Good At This" — Dustin O'Halloran
"Harvest" — Jim Brickman
"Walk" — Christoffer Franzen
"Emersion" — Tony Anderson
"Exhale" — Christine Brown
"A Simple Life" — Brian Crain
"A Hero's Call" — Joseph Bein and Steven Harriton
"Moments" — Jonny Southard
"Only The Beginning Of The Adventure" — Harry Gregson-Williams
"Awareness and Affirmation" — Brad Jacobsen
"Wasted Air" — Thomas Newman
"Shadows Of The Moon" — David Darling and Michael Jones
"Morning Breeze" — Out of Berlin
"Soul of a Child" — David Helping
"A Day Like No Other" — Davol
"Immersed" — Simon Daum
"One Day" — Sham Stalin
"On the Wings of Innocence" — David Arkenstone

Bonus

Those who subscribe to the Music app can also find spoken word content if they know what to look for. Some truly marvelous material is made available from the CBC Radio Archives. Look for anything by Stuart McLean. He was the man behind the exquisitely

funny Vinyl Cafe show, much beloved by listeners of CBC Radio. A vast amount of that material can be found and enjoyed. Also, you can find seasons of a lot of other CBC radio shows. Look for Under the Influence, The Debaters, Afganada, and much, much more. You should also try searching for CBC, BBC, and NPR to see if material from each organisation might be available for your listening pleasure.

Reaching Out: Communicating with Others Using Included Apps

Your iOS device can make communication with others on your own terms very easy to do. This is especially true once you have mastered typing, dictation using Siri, and navigating apps using VoiceOver. No matter which iOS device you get, it can be used to communicate with others. This includes the iPod Touch, which is basically an iPhone minus the phone. There are a set of apps included in iOS especially for this purpose. In addition to these, there are more apps for various social media such as Twitter available in the app store. All of these apps tie into contact information and, most of the time, tie into Siri as well. This makes communicating as effortless as possible even when you're just getting started.

The Contacts App

The Contacts app on the home screen is your first stop. This is where you should put any contact information you have about people who you want to communicate with. iOS can then make use of that information via other apps. The more information you put in this repository, the better your iOS device will serve you as a communications aid. It is quite possible to add contacts to different groups such as for personal and work. Personally, I just have them all in a single list within the app.

Unless you change settings, contacts will be kept in alphabetical order. By using the VoiceOver rotor and turning it to headings, you can then flick up and down to the next or previous letters. This makes for a quick and efficient browsing experience. For more control over how contacts are displayed and organized, go into the Settings app and double tap on Contacts. You'll see settings for whether contacts are sorted by last name first or by first name. There are also settings regarding the use of short names and/or nicknames. For some languages, these settings won't apply, since names are always ordered the same way.

How to Add Contacts

Beginners may find it a chore to enter contact information. Dictation can certainly help but, often, the virtual keyboard is simply the best way to do things. The rewards of this labour will very quickly become apparent. There is an Add button near the top left of the screen. Double tapping this button takes you to a form that you fill in. There are edit fields for all sorts of information. You can also use the Insert buttons next to fields to add more things like additional phone numbers or email addresses. It's very comprehensive. You can specify different ringtones for contacts if you desire. My parents have a

different ringtone assigned so I always know when it's them calling.

Some apps such as Facebook will present you with opportunities to integrate your contacts. This adds information from companies like Google and Facebook where you may have contact lists into the library of contacts on your iOS device. This information will then populate your list in the Contacts app. Before this step is ever taken, you will always be asked to be certain you want this to happen. Generally speaking, iOS is very careful when it comes to your privacy. On that note, look in the Privacy settings and you'll find a Contacts category. This lets you control which apps have access to your contacts. Further along, you'll find similar buttons for Facebook and Twitter. No decision you make is ever written in stone regarding contact integration.

How to Access and Edit Contact Information

As your contact list grows, you may want to use the search field near the top left of the app to quickly narrow down the selections. Type any part of the contact name into the field, and you'll likely see it pop up. Flick right through the choices to arrive at the contact. Double tapping on a contact opens it, giving access to its information. You can then perform actions such as sending a message, initiating a FaceTime call, sending

an email, etc. The Back button gets you out of that contact's information back to the general pool of contacts. Before doing that, though, notice the Edit button near the Back button. This lets you access and edit the information. You can also completely delete the contact.

Once information is in the Contacts app, iOS will start using it to make the social part of life easier in many different ways. If you have an iPhone, the first result of these efforts you're likely to notice is that you'll know who's calling. Phone calls will be identified by name. You will also be able to make use of that information from within apps like the Phone app, Mail, FaceTime, or Messages apps. Also, Siri can use this information. This lets you order Siri to do things, which is a lot easier than swiping and typing especially as you're mastering the basics of VoiceOver. You can teach Siri about relationships. For example, it knows that Sara is my wife and Dan is my brother. This lets me say things like "tell my wife I'll be late for dinner" and be understood. You can dictate text messages, emails, and Facebook posts without having to go into the respective apps first. A lot of work has gone into making Siri a good communications aid. The Contacts app is how you give your iOS device and Siri what they need to help you keep in contact with people who matter to you.

Any time you need address information, chances are you'll find an option to get it from your contacts. For instance, I sent my mother a gift from the app store and quickly got her email address thanks to the information about her in the Contacts app. Contact information is also used by the Maps and other GPS apps. This lets you ask for directions to reach addresses stored in the Contacts app. This can include transit, walking, and driving directions via the Maps app, BlindSquare, or other apps that can take advantage of this pool of information.

The Phone App

People who have iPhones will be happy to know that the Phone app is very comprehensive and easy to use. It was originally one of the centrepieces of the iPhone. Making, receiving, and managing calls are all very easily achieved presuming you have mastered operating the touchscreen with VoiceOver. Siri is fully integrated with this app, so you can call anybody in your contacts by simply asking Siri to call the person's name. Indeed, it is perfectly possible to ask Siri to call a number that you recite. Just don't pause for too long or it will presume you've finished and won't realize you're having trouble remembering the rest of the number.

There are five tabs across the bottom of this app. They are Favourites, Recent, Contacts, Keypad, and Voicemail. Double tapping on a tab takes you to that particular area, which will occupy the rest of the screen.

Dealing with Calls

If a call comes in, a screen pops up with numerous options. If you simply want to answer it, just double tap with two fingers anywhere on the screen. This is also how you hang up. If you're wearing wired EarPods or other headsets, there should be a button you can press to answer or end a call. On the EarPods that come with your device, it's the long indented section that feels like it's been carved out of the remote in between the two round parts that can raise or lower volume. If you're wearing AirPods, double tap either one to answer or end a call.

You can also do other things. At the top of the incoming call screen are Message and Remind buttons. These will make a reminder to return the call later or respond to the call with a message you can type in. Declining a call will pass the caller on to your voicemail where he or she can leave a message. At the bottom left and right corners are Decline and Accept buttons. Double tap the button you want to use. You can press the Sleep/Wake button twice quickly to decline a call. Pressing that

button once will allow you to lock your screen so you don't hit keypad buttons.

Favorites

Having contacts added to your Favorites has a couple of implications. First of all, you can call them by going into the Favorites tab, flicking through the list of names, and simply double tapping on the one you want. Your iPhone will then make the call for you. Nice and speedy. Also, there are different rules regarding Favorites when it comes to Do Not Disturb settings. You can have these set to always allow people on your Favorites list through when they call even when in Do Not Disturb mode. I'm rather thankful for this as I would typically rather not miss a call from a family member, good friend, or my landlord.

Recents

Any calls you have missed, made, or received are all shown in this tab. They are organized in chronological order with the most recent call at the top. Flick right or scroll up with three fingers to quickly move through the list of calls. It is a handy way of easily returning calls especially if the number hasn't yet been added to your contacts. Simply double tap on the number or name to return the call. Alternatively, flick right and you'll find a More Info button next to each item in the list.

Double tap this button to obtain any known information plus find options to add the number to your contacts, thereby creating a new contact. There are other options similar to what you'll find in the Contacts app.

Contacts

This tab is basically like the Contacts app. Double tapping on a contact name will move you into that contact's entry where you'll find the usual options.

Keypad

This tab gives you access to a virtual phone keypad. As you input a number, you'll even hear touchtone beeps as you would if using an actual telephone. This is good for blind people, as you'll know when you've successfully entered the right digits. If you need to delete a digit, you'll find the button you need near the top right of the screen. Just below the numeric keypad but above the row of tabs, you'll find a Call button in the middle. It's right above the Contacts tab. Double tap that button to make a call.

During a call, the keypad is displayed so that you can make use of touchtone systems. There are occasions, however, when this is less than desirable, as it's possible to accidentally press keys with your cheek. There is a button that hides the

keypad if you wish. You'll find options right below the keypad to end the call, mute, or hide that keypad.

Voicemail

This last tab is a very nice addition presuming your carrier supports it. Not all phone plans come with what is called "visual voicemail". Presuming you have it, this tab will be where you go to receive your messages, set your greeting, etc. Messages will be downloaded to your phone for you to easily review at your leisure. I've become quite attached to this feature and pay a small fee for a package of additional features that includes "visual voicemail" as part of my phone plan.

If, for whatever reason, you don't wish to use this or can't get a plan that has it, you are still able to use the normal voicemail offered by pretty much all phone companies. You simply use the keypad discussed earlier to enter your passcode and operate the menus as you would with an ordinary touchtone phone. This may prove stressful for beginners, as they have yet to gain proficiency with finding and entering digits on their touchscreens. Visual voicemail eliminates this hassle and does away with any time pressure.

To use visual voicemail, double tap the tab, and you'll find a Greeting button near the top of the screen. This lets you record your voicemail greeting that people hear when you miss or

decline their call. I don't recall needing to do any other things to set up visual voicemail. I got it some years ago and have kept it ever since. You may need to get help from your carrier. When you receive messages, they are put in a chronological list with the most recent messages at the top. You can simply flick through them and double tap on a message to start it playing. Double tap on the More Info button next to a message if you want to get to the same contact page as you'd arrive at through the Contacts tab or the More Info button found in the Recents tab.

You can pause a message during playback, move back or forward through it, and do other things like return the call, delete the message, etc. This makes it easy to manage messages even if you have yet to deal with the rotor and flicking gestures. It makes for a very efficient stress-free way of dealing with messages.

Another sometimes incredibly handy thing about visual voicemail is that it produces a transcript of any messages you receive. These aren't always perfect. However, they can prove helpful at times to quickly see what a message is about.

There are other options such as call waiting, ending a first call and receiving a call that has come in while you're on a first call, adding people to calls, etc. I suspect that

carriers need to support these features. In appropriate circumstances, options will appear on the screen while you are in a call.

It is also possible to be in a call while still using other apps. Simply press the Home button to get out of the phone app. Your call will continue even as you do other things. There is a bar near the top left of the screen that you can double tap to return to the call screen if you like.

FaceTime

This app is used to make audio or video calls to others who use iOS devices or computers supporting FaceTime. To use FaceTime, you need an Apple ID for yourself. Presuming your device has been set up, you have already created your Apple ID. You'll also need to know an email address and/or phone number of people who you want to contact via FaceTime. This information may be found in the Contacts app or added in directly from within the FaceTime app. Once done, that person will be found in the Contacts app.

How to Make a FaceTime Call

You can do this in a few ways. From inside the FaceTime app, you can double tap on either the Audio, or Video buttons near the top of the screen. Next, double tap a contact's name. This will make a call to that person. You can also use Siri from

anywhere on your iOS device to make a call. Simply invoke Siri and then say "FaceTime" or "FaceTime audio" followed by the person's name. This will initiate a call. Also, you can initiate a FaceTime call from within the Contacts app. Simply go into the contact entry you're interested in, and flick right until you reach the FaceTime Call button. Double tap to initiate the call.

There are options you can use during a FaceTime call. Video calls can make use of the front or rear-facing cameras built into your iOS device. You'll find buttons to choose which camera to use on the call screen. You can also end a call in progress, switch to an incoming or waiting call, or mute your microphone. Double tapping with two fingers will accept or end a call. You don't have to be in the FaceTime app to receive a FaceTime call. A two-finger double tap will accept the call from anywhere. Also, a menu pops up giving you options that you can flick over should you want to decline the call, for example.

Near the top of the screen, you'll find an Edit button letting you delete FaceTime contacts. You'll find a Search field letting you look for contacts by name, email, or number. Also, look in the Settings app, where you'll find specific settings for FaceTime. These let you turn the feature on or off, choose which information people can use to contact you through FaceTime, and more. To specify whether FaceTime can use cellular

data, look in the Cellular setting. Remember that FaceTime must use either WiFi or cellular data. Also, video calls use more data than strictly audio ones.

I have found FaceTime to be especially useful in a few ways of particular interest to blind people. I've used it to show distant relatives what my apartment was like using the ability to switch to the rear-facing camera on the back of my iPhone. This has also been a useful way to have a sighted person help read things my OCR apps can't understand. Also, they can help me look for lost items. You could also theoretically use FaceTime to have someone sighted help you navigate somewhere or at least see where you were to find you more easily.

A Closer Look at Do Not Disturb

As we learn how to communicate with people, it is important to make certain that we remain in control of *when* we communicate. The Do Not Disturb mode is extremely useful when sleeping, attending meetings, visiting with friends, or at other times when you don't want to be interrupted by your device. Airplane mode is easy to activate but completely cuts all transmission to and from your device. Most of the time, this isn't what you want. We often don't want to be distracted but still want to be able to make calls, check email, shop online, or surf the web. Do Not Disturb mode makes certain that no

external calls or messages, nor any alerts generated by apps on our devices will interrupt us. Unlike Airplane mode, your device remains connected. You can still use Siri, receive calls, and other information. This means that you don't miss out on notifications. They wait for you when you're ready to deal with them.

How to Turn on Do Not Disturb Mode

You can simply tell Siri to do it. You can also go to the Control Center by touching the status bar at the top of the touchscreen and swiping upward with three fingers. Flick right until you find the Do Not Disturb button and double tap it to turn the mode on or off.

Adjusting How Do Not Disturb Works

Go into the Settings app and flick right until you come to a Do Not Disturb button. It's right before the General button and is completely separate from Privacy settings. In the Do Not Disturb settings, you'll find options letting you do several things. You can schedule a time of day when your device will automatically go into Do Not Disturb mode. This is useful for sleeping. I schedule my iPhone to enter this mode at 11 PM and come out of the mode at 6 AM. You can also control who is still able to reach you even in Do Not Disturb mode. I allow contacts in my Favorites such as my landlord, family members, etc., to

reach me. There's also a setting to allow repeated calls through. If people call more than once within a few minutes, they'll be allowed through. You can turn this off if you don't want that to happen. Another option lets you choose whether your device will be silent always or just when it's locked.

The Messages App

This is where any text, video, or audio messages are sent, received, and managed. You can send messages to groups or individuals. These are organized as "conversations". Messages are sent through Apple's service if they're to other Apple devices. These can be Mac computers or other iOS devices. You need to be connected to the Internet to use the Messages app. These go through WiFi or cellular Internet connection and don't count against your texting plan. Otherwise, if they're to non-Apple phones, they are regular text messages and will use your texting plan. You can attach media from other apps, record audio or video messages, and decorate your text messages in all sorts of ways.

True to form, Apple keeps things as free of complexity as possible. There are no tabs in this app. At the top, you'll find Edit, Compose and Search buttons. Between the Edit and Compose buttons is the app title, which is a heading. You can always turn your rotor to headings and get right back to the top

easily. Flicking right past the Compose button, you come to a search field. This lets you look for contacts and conversations, which is useful as you get more of these. Past the search field, you start with the main area filled with the names of groups or people and previews of the most current messages of each conversation. It is organized with the most recent conversation first. This keeps expanding as you communicate more. Double tap on a conversation to enter it.

How to Send a Message

There are a few ways to send messages. The easiest is to simply use Siri. Say something like "tell Norman I'll be late for lunch". Siri will compose the message, ask if it understood you correctly, and then offer you a chance to cancel or change the message. Otherwise, you can just say "yes", and it'll send the message. You can also ask Siri to read messages to you. This would be especially useful for beginners still getting used to VoiceOver.

Double tapping on the Compose button opens a screen letting you make full use of the app's capabilities. You can add one or more names from your contacts. Typing a partial name will cause likely candidates from your contacts to be listed. You can flick right to get to these and double tap the one you want to add. There are plenty of possibilities when it comes to creating your

messages. You can type and edit your message in the edit field after double tapping on it. Flicking over the field when it's ready to receive input, you should hear VoiceOver say "is editing". You can type your message or find the Dictate button to the left of the spacebar on the virtual keyboard. Double tap and speak your message, finishing by double tapping again to stop. Messages can have more than one line, so use the Return button if you want. When finished, flick right to get to the Send button and double tap it. Recording an audio message is also very simple. Double tap and hold with one finger on the Record Audio button. While doing this, speak your message and release your finger when you're done. You can then play what you've recorded to make certain it's correct before sending the message via the Send button.

Receiving Messages and Viewing Conversations

When messages arrive, VoiceOver will read them to you presuming you haven't changed any settings in Notifications to stop this from happening or have Do Not Disturb mode turned on. This makes it possible to carry out conversations without ever typing or swiping. All fine and good for current simple stuff. When you want to look back through a conversation, double tap on it and go into that conversation's screen. You can then flick right through the messages from oldest to most recent. At the

end of the messages, you'll find tools to compose your next reply in that conversation. This will always be at the bottom right. You can also see if messages have been delivered and whether any additional content has been added such as "stickers", "files", etc. Near the top left by the contact name, you'll find a More Info button. This shows you anything you've entered about the contact and gives you a series of options such as making a FaceTime call, sending an email, etc.

Participating in Group Conversations

Once you've added more than one contact to a message you've composed, you will start a group conversation when you send that message. You can also receive a message that involves you in a group conversation when you reply to it. You can name groups once they're created. To do this, go into the group conversation, and use the More Info button. Flick right from the top left, and you'll find a "name" field. This is where you can enter a group name. The More Info screen also has other options, letting you add new group members or leave a group conversation you no longer wish to participate in.

Concerning Emojis

VoiceOver will describe any emojis other people use in their messages to you. If you want to use them yourself, while you're in an edit field, find the spacebar at the bottom of the

keyboard and flick left past the dictate button. You'll find a Next Keyboard button. One such keyboard is full of these emoji images. Once you've switched to that keyboard, you can find whatever emoji you want and double tap it. Use the Next Keyboard button to cycle through any keyboards you've added and get back to your normal preferred keyboard. Descriptions for emojis are generally well thought out and brief, so this is perhaps the easiest way to clarify your meaning through imagery for sighted people. It also doesn't cost anything.

Settings Associated with the Messages App

Go into the Settings app and double tap on Messages. These settings let you control a lot of aspects about how the Messages app behaves. For instance, you can choose whether subject fields are shown. You can also turn on a setting that sends images in low quality to save data. You'll also find a Blocked button, which lets you manage blocked contacts you don't want to hear from. There's another setting letting you choose not to be notified when people not on your contacts list send you messages. They are kept in a separate list for you to review at your convenience. There are many more settings. Also, remember that settings in other areas like Privacy can influence how the Messages app functions. It's one of those central apps that ties into a lot in iOS.

More to the Messages App

Apple has built considerably more capabilities into their Messages app. The Digital Touch aspects allows people to add drawings, backgrounds, and other things to their messages. That was what I used to accidentally send my good friend an angry fireball. I haven't had any success using this effectively with VoiceOver. The sketching and drawing aspects seem to be the real core of Digital Touch. If you receive messages with drawing or Digital Touch elements, you'll be told the elements are there but not what they are.

Using Background Effects

There are a set of "effects" you can attach to your messages. They can either be contained in bubbles or else occupy the whole screen along with your messages. To use these, write your message first. Next, double tap and hold on the Send button or press firmly on it if you have 3D Touch enabled. This adds a panel to your message screen containing choices. There are a more limited number of choices for bubble effects. These include slam, gentle, loud, and invisible ink. It may be possible to add more choices here. Screen effects include lasers, balloons, confetti, and many more. It will default to one effect, but if you flick right past this, you'll come to a page slider that changes the effect to be sent. After choosing the desired

effect, find the Send button and double tap it. If you get a message with an effect, you may hear appropriate sounds as the message is read. The effects have descriptions that VoiceOver will read out in addition to your message.

Adding Stickers

One of the easier elements to make use of for blind people are "stickers". Think of these like stamps. Using them is just as simple as sticking a stamp onto paper. Next to the Digital Touch button, you'll find a Messaging Apps button. Double tap on this and more options will appear on the touchscreen. If you're already in a message, you need to flick left to find a Show More button and double tap that. Then you can access the Messaging Apps button. This gives you access to a whole lot. Once you enter this area, a slider moves you between pages of options. You start on a "recents" page, but if you've never used Messaging Apps and stickers before, nothing will be on it. Go to the next page and you can look through options. Near the bottom of the screen, there are buttons for browsing apps and stickers. You default in the stickers section, which will contain any stickers you've acquired. Some apps come with stickers. For instance, the Weather Gods app is popular among blind people and it has a number of well-described weather stickers. There are also stickers you can purchase depicting favourite movie

characters, locations, and much more. Flick right through the stickers you have and double tap the one you want to add. It's possible to add more than one sticker, but I don't think you can position them manually.

Stickers are designed for decoration, whereas emojis are images carefully chosen and constructed to make the emotional context of messages clear. Think of stickers like stamps and emojis like psychological punctuation marks. There are a far more limited number of emoji symbols. They are all included in the Emoji virtual keyboard included as part of iOS. Emojis are free and available for use in any app capable of accepting typing. You won't find a Luke Skywalker emoji, since Star Wars images are trademarked and don't clearly convey emotional meaning to people unfamiliar with that fictional universe. One emoji is a slice of pizza. While this is a food of western civilization, you can easily tell that it's food and conclude that the message sender may be expressing he or she is hungry. You can realize this even if you've never encountered pizza before. Emojis can certainly be use decoratively, and often are, but that isn't their primary purpose like it is with stickers.

The Messages App Store and Integrated Apps

These apps plus others you already have are capable of enhancing your messages or making use of the Messages app to let

you do things. Once you acquire an app with this kind of capability, it will be put in your "app drawer". This is also where you'll find your stickers. You can manage the contents of this app drawer. Find the Manage button and you can hide what you don't find useful, removing it from the drawer. You can also reorder contents of the drawer. The first time you visit the Messages app store, you can choose to automatically add apps that integrate with Messages into the drawer. I recommend doing this. Presuming the app in question is accessible, the part that integrates with the Messages app should also be.

One good example is the Music app that comes with iOS. After finding it in my app drawer, I was able to send a message to my wife Sara and add a clip of the song I was listening to. She could hear that music as she read the message. I only had a short poke around, but it looks like I could have also sent clips of recently heard songs and not just the one I happened to be hearing as I wrote the message. The Dropbox app lets you send links to files you have uploaded to that service, sharing them via messages. There are lots of other apps. Many of them are free. I urge people to experiment with people who know you as you try these apps out. Before spending any money, look on www.applevis.com. The forums and app recommendations will be helpful in avoiding spending money on more visual apps or on

stickers that haven't been labelled accessibly. Exploration of screens is key. Take time to flick and feel around to get a sense of what's possible with messages apps in the drawer. VoiceOver doesn't read out all your choices but encourages you to explore and find out where they are on the touchscreen.

The Mail App

Apple has created a good simple app for dealing with email that is completely accessible. It can organize your mail by thread, which can really help if you get a lot of email. You can also make use of different mailboxes to make certain you get to all your important mail. As with all of Apple's included apps, it covers the basics well and steers clear of too much complexity. It pays to have the rotor gestures mastered, as they are helpful in reading and editing messages.

How to Set Up the Mail App

Go into the Settings app and flick right to get to the Mail settings. Double tap on that, and you'll be where all the setup and preference options are. You can then enter the needed information if it isn't there already. Presuming you've created an Apple ID, you'll have already given it an email account or have had one created for you by Apple. You may need information such as your Smtip server, password, etc. if you want to use an email account from another email service like Gmail.

There are settings for deciding how messages are organized. You can have them grouped into threads or simply placed in your mailboxes in chronological order. You can also choose how many lines are shown as a preview of messages. You can decide whether you want to be warned before deleting messages. There are options in the account area to decide how frequently new mail is checked for and pushed to your iOS device. There are also composition settings, including the ability to create an email signature that is automatically included below every message you send.

Layout of the Mail App

This is another case where Apple didn't separate everything into tabs. Everything is on one main screen with various options like composing email taking you to a separate screen that is focussed on a given task. At the top, you'll find the mailbox selection. You default to the inbox, but double tapping the mailbox Back button takes you out of that and into the mailbox list. Presuming you're in the right box, flick right and you'll find an Edit button. This lets you do things like select a bunch of messages and move them to another box, delete them, etc. There's also an Edit button near the top of the list of mailboxes. This lets you reorder, add, and remove boxes as your needs change.

Right of the Edit button is the search field. This lets you search for specific messages. Next comes the main area where messages are listed. You can flick through messages or threads if you choose to deal with messages thread by thread. Double tap to fully go into a message. There's no limit to the size of your message list.

How to Browse Messages Within a Thread

Turn your rotor to the messages setting, and you'll be able to quickly navigate through messages by flicking up or down. This lets you get a handle on discussions easier, letting you quickly skip over to the next or prior message within a thread.

Composing Emails

The bottom right corner always contains the Compose button. Double tap this to get to the message composition screen. There are various fields. Getting around the screen is pretty simple. Double tap to go into a field. You default in the "to" field where you can enter a full or partial name or email address. Flick right after typing some of a contact's name or email, and you'll be presented with any options that might be who you're trying to contact. Double tap on the ones you want to add to the email, and their names will be added. Flick to the right past any such options to get to other fields like CC, BCC, subject, and finally, the message body. Remember that rather than

flicking, you can feel around the screen to find out where fields are and double tap on them to enter them. When done composing, feel around the top left of the screen and you'll likely find yourself on the Back button. Flick right and you'll come to the New Message heading. To the right of that is the Send button. Double tap that to send your message.

Filtering Messages

Touch the bottom right corner to find the Compose button. Flick once to the left of this, and you'll come to the Filters button. This lets you filter messages so that only messages you're particularly wanting to focus on are shown. For instance, I have my filter set to "unread messages" so that I'm not bothered by ones I've already read. There are many more possible filters, so take the time to look around the options after double tapping the Filters button.

To get back out of areas, simply check the top left corner of the screen for a Back button. You'll never be trapped anywhere. There should always be a Back button. Also, one of the drawbacks of the Mail app is that there doesn't seem to be any way to simply delete all mail in your inbox. You have to actively delete or archive messages individually. This is by far my biggest gripe with the app. Once you're done with a message and have archived or deleted it, you are automatically taken

into the next messages. For more of an overview to pick what to tackle next, double tap the Back button to return to the mailbox you're working with.

One other gripe is that it doesn't look like you can compose a message and then decide to attach something later. Instead, you have to go to the file you want to attach, use the "share" option and choose "mail". You'll then be put in the composition field and the file you want to share will be attached.

Conclusion

I hope this helps get people started using their iOS devices to communicate with others. It's one of the primary ways these portable and powerful flat objects have changed many lives for the better including my own. Whether I'm stuck in an elevator, in a car, or walking around the manmade lake near my building, I can be in touch with whoever I might need to. Should I drop something onto a patch of carpet where I couldn't hear it land, I could use FaceTime to contact a sighted friend or family member to literally look around for the object without leaving his or her home. There are just so many implications.

The apps I focus on in this section mainly connect with people who are in your more immediate social circles. You might work with these people or be friends with them. Most likely, you

are sometimes with them in everyday life. Hopefully, these apps and others included with iOS on your device will help keep your relationships solid and on track.

When you bring in apps made by others and offered in the app store, the possibilities grow vast, indeed. There are special apps made to help deaf-blind people communicate more easily with others. There are apps like Google Translate that can render words spoken or written in another language understandable in mere fractions of a second. Combine these sorts of capabilities with the stupendous amount of information available from the Internet, and the implications for collaborative creativity seem endless. Once you've mastered the mechanics of VoiceOver and using a touchscreen, there are no other barriers to expressing yourself well.

App Store Expedition

Skype and Zoom

If you want to expand your communications reach beyond what comes included on your iOS device, the app store has you well covered. For contacting people with devices other than iOS ones, there are always options like Skype, which is a very popular communication method now owned by Microsoft. They have a very accessible app for iOS users. For private group conversations, there are apps like Zoom, which also have software available for

Android, Windows, and other platforms. Beyond these, for more public widespread communication, there are a whole range of social media options with often many different app choices to use them. We'll discuss social media in depth later in this guide.

Gmail Email

Personally, I mainly use the Gmail app created by Google. I find this works better for me than the Mail app that comes with iOS. There are many other email app choices in the app store. These will offer different options and ways to help you manage your inbox without going nuts. For instance, Google created the Inbox app, which automatically organizes your messages into related bundles. Your email provider may have created a special app for its customers to use. Also, other developers have taken their own crack at doing email differently. I haven't seen much discussion of different email apps regarding how accessible they are. People seem happy with things in general. As always, people interested in finding something different should look at www.applevis.com. Look in the app directory, which is well categorized. You can also search by keyword on the AppleVis site, which will also look into discussion forums where people talk about their experiences with different apps.

Cardhop

The Cardhop app was developed to make dealing with contacts a more streamlined intuitive experience. The app has a parser that makes it able to understand natural sentences you dictate or type, provided they are about contacts. The app can build complete contact entries for you with greater efficiency than using the Contacts app included with iOS. It can also search for and act on contacts in your database or third-party services you give the app access to. It will also interface with apps like FaceTime, Skype, and Messages, allowing you to call or message contacts in many different ways.

While not essential, this app exemplifies how app developers take the core functions built by Apple and enhance them in different useful ways. The app developer, Flexibits Inc., is well aware of blind and low-vision users. VoiceOver and large type features are, therefore, fully supported. Also, the developer has been quick and eager to respond to suggestions to improve the app's accessibility. This app costs \$5.49.

Lifestyle Apps: Keeping Life Organized and More

With their extreme portability, iOS devices are uniquely positioned to be of help in many ways. From working out your share of a bill at a restaurant table with the handy calculator app, to keeping track of appointments with the included calendar app, you'll be surprised how much you can do with apps that are automatically included with iOS. These are useful in everyday life and are helpful for students. These apps are simple and offer basic functionality. Beginners can feel comfortable practicing their skills using VoiceOver and exploring the screen.

Should you need more functionality or a different approach to these everyday tasks than the included apps offer, fear not. Chances are that you can get a more suitable app for your needs in the app store. I've found a number of apps offering alternative approaches that suit me better. Later in this section, we'll go on an app store expedition. I'll tell you about some of these alternative apps. I'll also explain how I found out about them. For lack of a better category term, I'm calling these "lifestyle" apps, since they are useful in everyday situations. Calling them utilities just doesn't seem quite right.

Before we take a closer look at the various apps, remember that you can use Siri, Apple's built in personal assistant, to perform many of the tasks these apps can do. In fact, Siri makes use of these apps on your behalf. If you tell Siri to create a reminder or appointment, it will be done using the Calendar or Reminders app that come standard in iOS. Beginners who struggle with navigating and typing will be able to use Siri to enter appointments, create reminders, and check what's due or coming up. Earlier in this guide, there is an entire major section that deals with Siri and other digital assistants you might wish to acquire for your iOS device. It can be very convenient to use Siri while you're on the move or in a hurry to add that upcoming dentist appointment, perform a quick calculation, or add some items to a reminder listing groceries you need to get.

While Siri will accomplish tasks like adding appointments easily, it isn't as well suited when it comes to reviewing a lot of information in detail and making a bunch of changes. If you want an overview of your scheduled events for the month, you are well advised to become familiar with the Calendar app itself. You'll find it far more efficient to be able to use that app, look at your day, week, or month, and schedule events with an awareness of how everything fits in or doesn't. This holds true

with rearranging and altering reminders based on a wider overview of your upcoming schedule.

Now, we'll examine the lifestyle apps that are provided by Apple in greater detail. These are all safe for beginners to experiment with. By doing this, you will gain familiarity with VoiceOver gestures and become more proficient with navigating around various screens.

The Calculator

Everyday life is full of mathematics. From calculating tips in a restaurant to figuring out your budget, numbers pop up everywhere you go. To handle the kind of math problems most of us are likely to encounter, Apple has provided the Calculator app. This app is included in iOS and will likely fill the mathematical needs of most people. The calculator works well with VoiceOver. It has two different modes that are chosen based on whether your device is oriented in Landscape or Portrait mode.

Basic Calculator

If your iOS device is in portrait mode, you will have access to a basic calculator. Functions include addition, subtraction, multiplication, division, and percent.

You'll find a numeric keypad at the left of the screen covering most of the surface. Lower digits are at the bottom and

higher are at the top. Decimal is right of 0. Equals is right of decimal.

Above the equals sign, you'll find functions proceeding up the far right of the screen. Edition, subtraction, multiplication, and division at the top. Above the 7, 8, and 9 keys are clear, plus-minus, and percent keys. Above this is where the results are shown. VoiceOver automatically announces results. You can also read them more carefully with the rotor after touching the result space. The layout is simple enough to be mastered quickly. Very handy for most day to day stuff. Keys are placed where they'd be if you were using a physical calculator of similar size.

Suppose you want to know how many minutes there are in a year. You would go into the Calculator app. Next, you would double tap on 3, 6, and 5 for the number of days in a year. You would then touch along the far right side of the screen. Keeping your finger on the screen, slide it up or down until you find the "multiply" option. It is more towards the top of the screen. Once you find it, lift your finger and double tap the Multiplication button. If you're using touch typing, just lift your finger and it will be entered. Next, you would enter the 24 hours in each day by double tapping on the 2 and 4 digits. Next, you would touch along the right side and slide your finger to

find the "multiply" key again. Lift it or double tap to enter that operation and then enter 6 and 0 for the number of minutes in each hour. Finally, touch near the bottom right corner of the screen and slide your finger until you find the Equals button. Lift your finger and you will hear the result learning that there are, in fact, 525,600 minutes in a year.

After some practice, you'll find your speed increasing as you develop a muscle memory for where various calculator functions are. I still tend to slide my finger to the right function even after all these years. However, the basic layout of the Calculator app is a good place to begin to experience how building a mental map of where things are on the touchscreen increases your speed and efficiency.

The Scientific Calculator

As long as orientation is unlocked, turning your device sideways transforms the basic calculator into a scientific calculator with many more functions.

The basic functions are all still there but are condensed onto an area at the right side of the screen. To the left of the numbers, you'll find the rest of the screen taken up by all sorts of higher math functions. This includes parentheses, geometric functions, exponents, and lots more.

This layout will take longer to master, as it crams a lot more onto the screen. I recommend the use of touch typing mode. Set this with the rotor. This way, nothing is entered until you lift your finger from the surface of your device. This gives you a chance to feel around for the right digit or function and makes entry mistakes less likely.

Remember that this scientific calculator has been designed with more average users in mind. For people working in fields involving higher order mathematics, there are plenty of even more powerful calculator apps to be found in the app store. I steer you to some accessible alternatives in the Getting Things Done section later in this guide.

The Clock App

This app packs a bunch of handy time tools into a single app. It includes a world clock, an alarm clock, a "bedtime" sleep analysis, a timer, and a stopwatch. Each of these functions have their own tab. From a blindness perspective, there are a few unfortunately missing abilities. There is no way to tell time through vibration feedback like with the Apple Watch. Also, there is no facility to set chimes.

The World Clock

The leftmost tab on the bottom of the screen accesses this clock, which can display current time in many different cities

around the world. The Edit button is found at the top left of the screen. Double tapping this brings you to an edit mode that lets you arrange the order cities are displayed in as well as delete cities you don't want. Double tap and hold on the Reorder button next to a city's name and slide your finger up or down to move it. Hit the Done button when you're finished.

The Add button is one flick right of the words "World Clock". It lets you add new cities from a large list. You may not find your particular city, but you'll find one close enough. I have Toronto; Cupertino, California; and London, England on my world clock. Helpful for catching online events like webinars, Internet radio shows, or Apple presentations.

On the iPad, instead of a simple list of cities, there's a world map. you can feel or flick through the cities, but you'll find more information shown including sunrise and sunset times. All of this may prove useful particularly for travellers.

The Alarm Clock

This is a very easy alarm clock to operate. You can have multiple alarms for various days and times. For each of them, you can choose which of them are on or off. You can add new alarms with the Add button. There's an Edit button at the top left. Use that to change the characteristics of alarms by double tapping on an alarm and flicking right through the various

options. There are plenty of options including snooze, sound choice, etc., allowing quite a bit of latitude in constructing your alarm. You can select different sounds, any ringtones you have, or songs from your music library.

While I usually end up being awake prior to when I need to be, I have alarms set for early morning hours that I can quickly turn on if there's a special reason why I absolutely have to be up by a certain time.

Bedtime

This lets you schedule a reminder to go to bed plus a wakeup time. You can select from a number of attractive wakeup sounds as a gentler approach to wakefulness than the alarm clock. Also, you can set things so you're not woken up on weekends. It's pretty flexible. It analyzes your usage of your device to help determine when you're actually sleeping or when you might perhaps have gotten up early. Data is recorded and placed in the Health app where it may be used in conjunction with other information or third-party apps. There are numerous apps designed to track and analyze your sleep to improve your health.

Stopwatch

You can perform all stopwatch functions easily. No automatic reading of time is done, but you can easily check it

by touching the screen near the middle. There's a heading at the top, so you can set the rotor to headings, flick up to get to the heading, and then flick right to get quickly to the stopwatch time. Double tapping the Lap button will quickly give you the current progress, reading the exact moment the button was pressed. There are also Stop and Reset buttons.

Timer

This is your basic timer. There are no announcements as the timer counts down. You can set duration and choose the sound that plays when the timer expires. Also, you can choose to have it stop playback of whatever music, podcasts, etc., that you're listening to. Handy if apps don't have their own sleep timers.

Like the stopwatch, you can check timer progress while in this tab of the clock app. Also, presuming nothing eclipses it, you can find the timer on the lock screen. Music track information can affect this, as track information seems to get priority.

I frequently use the timer for tasks such as washing my laundry. Also, it comes in handy when cooking meals. There are many uses for a simple timer in ordinary life.

The Notes App

If you need to quickly dictate or type notes, you'll want to check out the Notes app included with iOS. As its name

implies, this app lets you easily create notes that are stored in folders. These notes can be typed in or dictated. For people with useable vision, there are facilities for basic drawing so you can add simple pictures or diagrams to your notes. These notes can be protected by passwords if desired. They can also be shared with others.

The layout of the Notes app is simple. There is a folder browser on the left with a Back button at the very top. A default Notes folder is created for you, which is nested in the iCloud folder. This makes certain that your notes are kept synchronized between devices by default. It also makes certain that your notes are backed up regularly to iCloud. There is a Show Gallery View button that will toggle this different view on or off. It appears to make absolutely no difference for VoiceOver users but might for people with low vision. You will also find a search field allowing you to look for particular notes. There is also a sort selector. By default, your notes are kept sorted by "date last edited". Double tapping this button reveals that you can also have your notes sorted by "date created" or by "note title". You can set the default to whichever style you would prefer when the app first opens. The More button lets you select notes and perform additional functions on them once selected.

To open up a note you've already created, double tap on it. You'll find the New Note button in the bottom right corner. Double tap it and the note creation screen will appear. Near the top left, you'll find buttons to "add people" who can view and write in the note. You'll find a Share button letting you send the note via email or share it in other ways. To the left of the edit field at the centre, you'll find a constantly updated time stamp. There's an edit field in the centre of the creation screen. That's all you'll need for creating a basic note. Type in the information or dictate it using the Dictate button that appears on the virtual keyboard. While you're in the edit field and in editing mode, a Done button is just to the left of the edit field next to the time stamp near the top. You'll need to exit the edit field to move to any other controls on the screen. Use the rotor to move within your note and edit text.

Past the edit field, you'll find a number of other buttons that take you beyond basic notes. For instance, there's a button to "add table" so you can create a table of rows, columns, etc. There are other buttons letting you choose different text styles, make your note a checklist of items, and presuming you have some vision, use drawing and handwriting tools. All of this is optional. If you prefer, you can use a Hide Toolbar button to tuck these options past the edit field out of your way.

It is possible to secure sensitive notes so that you need to use security measures to view and alter information they contain. There are plenty of third-party notetaking apps available in the app store. Each has a different approach and may be more suitable depending on your style and situation. Even if you ultimately choose something else for your notetaking needs, this app will be useful for learning the basics of text editing and typing.

The Voice Memos App

Designed for quick notetaking and recording, this app has been upgraded in iOS 13. It can now name recordings made automatically based on where you're located when you make them. Also, it can save those recordings in one of two formats. By default, it uses a compressed but still relatively high quality format. However, if desired, it can use a lossless format that captures the full spectrum of audio. This would be useful for creating recordings of settings where background ambient sound is desirable.

The Calendar App

The calendar app has a reasonably simple layout, keeping everything on one screen. There are no tabs separating different areas like you'll find in other apps. Starting at the very top left of the touchscreen below the status bar, you'll find Search

and Add buttons. These let you search for and add events to the calendar. At the bottom right are Today, Calendars, and Inbox buttons.

So far, so good. However, things get a little tricky in the middle. The rest of the screen is taken up with a scrolling calendar. Years are separated by headings. Setting your rotor to the Headings setting will, therefore, let you scroll easily through years. Each month is a button, so flicking left or right goes backward or forward by month. You can scroll indefinitely backwards and forwards to past or future years. Touching a month at the top of the screen and flicking left won't get you to the Search and Add buttons but will just keep scrolling. The same goes for when you're at the bottom of the screen and flick right. It takes a bit of getting used to. To reliably get to the option buttons, it's best to touch the top left or bottom right corners, landing you on the Search and Inbox buttons, respectively. You then flick right from the Search button or left from the Inbox button to reach the additional buttons.

When you're at a month you want a closer look at, double tap on it. You will be taken into that month's calendar. The current month and day are always indicated when you go over them in their respective level detail. There are no headings in the month calendar. However, each week has its own row of days. Turn

the rotor to Vertical Navigation to move quickly through the weeks of a month by flicking up or down. This keeps you on the same day of the week. Double tap on a day to see events taking place on it. They appear at the bottom right just before the Today button when the day is highlighted. However, you can get into an even more detailed daily view where any events in a day are shown along with their times. You can navigate this list by heading or by a special "event" setting that appears on your rotor. Double tapping on an event will show all its details and any notes. For instance. St. George's Day is a holiday celebrated in some parts of Canada on April 23. A note included in the Canadian Holidays calendar indicates that it may not be celebrated in your area. Double tap and hold on an event to change its start and end times.

You can scroll through different weeks by three-finger swipes left and right.

The calendar gives good functionality but takes time and experimentation to really master. I only learned about some included capabilities while preparing this section of the guide and consulting the user guide written by Apple as part of that process. That's something you'll find as you use iOS extensively. Unless you take the time to read the user guide, there's not always a lot to point you towards useful features.

It really pays to take the time to do that and also explore within various apps you use.

To add an event, double tap the Add button. An entry screen will appear with a number of edit fields and options. You can get around it by flicking left and right. Double tap on an edit field like "title" to enter information about the event. Once you're satisfied with the contents of the fields, find the Add button at the top left of the screen right below the New Event heading. Once you've entered sufficient information, this button will become active and no longer be dimmed as it was when you began creating your event. Once you double tap the Add button, the event will appear in your calendar. Nothing is carved in stone. It is quite possible to change an event. Double tap on it while in the "day view" where events are listed. You can also search for it and double tap on it in the search results. You can then edit it easily and/or remove it.

The Reminders App

Apple has drastically upgraded this app in iOS 13. It integrates with Siri and is capable of handling reminders for multi-step tasks. This gives you the ability to create and deal with reminders. These can be repeating or once-only reminders. You can group reminders in different lists such as a list for

work-related reminders and a separate list for home or personal reminders.

I deeply appreciate the work that Apple has done upgrading this particular app. The old Reminders app couldn't handle project management. You could absolutely do a reminder to tell you to get the milk at the store. In fact, you could literally cause the reminder to trigger when you were at the store. You can do this in the new Reminders app as well. However, you couldn't do anything with more complex tasks. For instance, to complete the guide I'm writing, I need to complete each of its sections. I can create a master list of reminders call "Complete the written guide". I set the completion date on that for a future date. In that list, I can then add tasks and subtasks. Completing each major guide section is a task. They can have completion dates, priorities, and other options. Meanwhile, completing each section requires several steps that can be added as subtasks. Both tasks and subtasks are themselves reminders and can have all of the properties like due dates, locations where they're triggered, priorities, etc. This ability to categorize makes it possible to manage large-scale projects and quickly get a feel for what needs doing. I no longer need a third-party app to manage my larger creative projects. Before

this Reminders app came out, I needed to find a third-party app to keep things organized.

Basic Layout

There are no tabs to worry about in this app. Instead, Apple keeps everything on one main screen. Unless you're creating a reminder or working inside a list, that's where you'll be. At the top of the main screen are an Edit button and search field. After those items, you'll find a group of four buttons leading to the Today, Scheduled, All, and Flagged smart lists. Below this, the next heading down is My Lists. Any custom lists of reminders you've created will be found beneath this heading. Finally, at the bottom, you'll find a button for adding new lists.

Smart Lists

These special lists are always present and are automatically populated with reminders based on the contents of reminder lists you create. For instance, the Today list will contain any reminders with the current date. The Scheduled list contains any reminders that have dates, allowing you to quickly get a grasp on upcoming reminders. The Flagged list contains any reminders that you've flagged. The All list simply contains all of the reminders you've created in one long list. The contents of the smart lists will update as you change or add more

reminders to different lists. This naturally includes the default reminders list that you will automatically operate in unless you specifically go into another list.

Custom Reminder Lists

Below the smart lists, you'll find a heading called My Lists. Beneath it, you'll find any lists you have created plus the default reminders list. At the very bottom, you'll find a button letting you add a new list.

If no list is specified when a reminder is created, it will be put in the default reminders list. That's what happens when you create a reminder using Siri. You can create different lists like I have for the guide I'm writing. Before you can create a new reminder in the app, you need to actually be in a list. Once you're in one, the New Reminder button will appear after the last reminder in the list.

You can do a lot to the reminders while inside a list. When you're on a reminder, you can double tap it to mark it complete. Alternatively, flicking up or down repeatedly will take you through a number of options. You can edit the name and details, add or remove a flag, drag a reminder elsewhere into another list, delete the reminder, and do other things. Also, if you have a lot of reminders in a list, you can set the rotor to three special settings including "completed", "uncompleted", and

"overdue tasks". Flicking up and down will move quickly to the next or previous reminder in that state.

Creating Reminders

There are a few ways to create reminders. Many third-party apps let you create them. You can ask Siri to create reminders for you. However, for the greatest level of control, it's good to use the Reminders app. Once you hit the New Reminder button, you can give the reminder a title or phrase like "throw out the garbage". Flick right from that edit field and you'll see a wide range of options. You'll find that things are reasonably uncluttered and kept out of your way unless you actually need them. For instance, you don't always have to give reminders any date or time. They can merely be part of a checklist of things to do. You need to double tap the Remind Me on A Day button to cause the appropriate facilities to reveal themselves. You will then find options for selecting the date. The same goes for time. You can set a particular time in the same kind of way that you select a date. You can choose to flag the reminder, choose a priority, and also add subtasks. Remember that subtasks are, in fact, full reminders that are tied to a reminder. You can edit their details the same as you would any reminder. When you're finished making choices about the details, hit the Done button found near the top left. Remember that you can add locations,

notes, a URL, and people to reminders. If you add a person to the reminder, you will be reminded when you are messaging the person. This is useful if you're always forgetting to talk about something with someone.

You can add images to reminders and also add badges to lists. For instance, I could add a bookmark badge to the list for my guide or a house icon to a list of reminders about chores around home.

Integration with Siri

Siri can learn from how you use the Reminders app and make suggestions based on where you are and what you're doing. Siri can suggest making a reminder or suggest actions based on its understanding of the sentences in your reminders. There's a lot of integration possible now with other apps. For instance, a reminder of an upcoming restaurant meal with friends might be able to hook directly into the restaurant's app, allowing you to place an order or reserve a table. A reminder of an upcoming appointment might prompt a suggestion to order an Uber ride or provide other transit information to help you be at the proper location in time for the appointment.

Further Thoughts on Lifestyle Apps

I hope the above information helps give you a sense of the many ways your iOS device can help you keep on top of everyday

life. Thinking back to my days as a student at university and in secondary school, I don't have to dig too deeply to imagine how much better I might have been at managing my time. These days, thanks to my iPhone, I'm easily able to keep track of the various appointments, meetings, and tasks I need to attend to. I receive notifications of things like approaching deadlines automatically. For people needing to travel frequently, you'll find that Siri often takes this into account and provides estimates of travel time from your current location to where you next need to be. As Apple improves its artificial intelligence and that housed within your device, such suggestions will increase in their scope and usefulness. The more you make use of your device, the more it will learn how best to serve you.

Apple has designed its apps to be useful to nearly everyone. Third-party app developers have built on the basic capabilities to create tools more suitable to specific cases like managing a work schedule or business. The advent of iOS 13 has opened up Siri and made it more able to interface with apps from other developers. The results can seem like magic. These capabilities will grow more powerful and better able to suit your preferences over time.

You might expect that being reminded of things ahead of time would feel like being nagged about everything. Perhaps, you

might worry that calendar and reminder apps powered by artificial intelligence might leave you feeling less in charge of your life and that your device knows more about it than you do. I haven't found this to be the case. Rather, it feels liberating like having a trusted companion watching over you and saving you from the consequences of forgetfulness.

If the clock, calculator, and calendar functions aren't quite meeting your needs, Look on AppleVis and the app store. There are plenty of accessible alternatives to be had. Advanced calculator alternatives are covered in the Getting Things Done section of this guide.

App Store Expedition

What if it were possible to combine the information accessed through the calendar and reminders into a single app? All of your time management would be right there in the same place. Wouldn't it be nice to be reminded of the time at regular intervals without having to interrupt what you're doing to touch the clock on the status bar? All these things are quite possible with the help of apps you can purchase from the app store.

This glance at two very different approaches to simplifying personal life organization demonstrates the value of looking beyond what is included in iOS. People have taken the basic building blocks Apple came up with and have produced some very

innovative tools that greatly enhance your capabilities. Beginners who struggle with the basic Calendar and Reminder apps have alternative ways of keeping life on track. These apps could make a very big difference to people who have frequent appointments to attend and need reminders every day to take various medications at regular times. Students whose lives are filled with assignments, deadlines, and social engagements will also appreciate having calendar and reminder functions enhanced and accessed in a single app.

Fantastical

Once awareness spreads through the blind community about a particularly good app, it doesn't take much effort to find out about it yourself. I first heard of Fantastical 2 through online acquaintances I've made over the years. I wasn't much interested at the time and took no immediate action. However, it seemed to keep coming up in reviews of other apps and in conversation. Comments were pretty much always favourable. I did quite well with the calendar and reminders apps that came with iOS. However, when working on this guide, I thought I should get it and see how good an example it would make of an alternative and better accessible approach to personal life organization. Ever since, I've been using Fantastical 2 exclusively. I wish I had

gotten it much sooner. The app developers are very responsive to ideas and/or accessibility issues.

For those who are comfortable with VoiceOver and wish to use an app designed for sighted users, Fantastical is one attempt to combine calendar and reminder into something greater than the sum of its parts. This app is made by Flexibits. It is free to download and try. However, it now requires a subscription to unlock its full features. It uses the data from the calendar and reminders apps, giving you a better unified organizer. It also has a natural language parser capable of understanding event or reminder-related sentences you can type or speak into the app. At present, this works even better than Siri when it comes to understanding naturally phrased events and reminders.

To dictate an event, you must first use the New Event button. Once you're in the edit field, find the Dictate button on the virtual keyboard on your iOS device to the left of the spacebar. If you're using a Bluetooth keyboard and want to dictate an event, you need to deactivate that keyboard so the virtual one pops up on your iOS device. The virtual keyboard is only present once you've entered an edit field. Fantastical doesn't replace Siri, so holding down the Home button or saying "hey Siri" will still behave as always. This lets you still use

Siri when you're hurrying through your day. However, if you can get into the habit of going into the Fantastical app and using its New Event button instead, you gain the advantage to speak or type very naturally about the event or reminder and have Fantastical understand you perfectly and do the right thing. Once you're certain you've been properly understood, find the Add button near the top left of the screen and double tap it to complete the operation.

Fantastical has all the control buttons at the top of the screen. Below is the "day ticker" that displays days with events or reminders. You can choose whether empty days are shown or not. Each day starts with a heading, so turn the rotor to headings to scroll quickly through days. You can scroll infinitely back or forward. A two-finger swipe downward while on the top of the day ticker will transform it into a month calendar. You can then turn the rotor to Vertical Navigation to examine days and weeks, flicking up or down through weeks and left or right through days. Use a three-finger swipe left or right moving back and forth through months. On the day ticker, flick right to go over each event or reminder within a day. Flick down when on an event or reminder to access a context menu, allowing you to select the default More action, or delete

it. Double tap on your choice to execute it or flick right or left to leave the menu.

Creating events is very intuitive with Fantastical. The New Event button is to the right of the Go to Today button. Double tap it and you'll be in an edit field. Type or dictate your event in sentence form. If it's repeating, you need to be specific. For example, it doesn't automatically know that birthdays happen every year, so you have to say "Michael's birthday is on October 29th each year". It will then fill in all the fields for you. If you're happy with the result, flick right to get to the Add button. You can also edit details to get exactly the event or reminder you want. If you want a reminder rather than an event, include the words "reminder", "to-do", or "task" in the sentence.

The buttons at the top are Settings, Go to Today, and New Event. There are also buttons allowing you to sort and filter what is displayed by "title", "location", and "invitees". All of these buttons will always be displayed at the top of the screen starting with Settings at the top left.

VO Calendar

For some people, a better approach to combining Calendar and Reminder into an easier overall app would be the VO Calendar app. Produced by Devista B.V. in partnership with a Dutch agency

for the blind, this app will cost you around \$14. This app is only useful to people who make use of the VoiceOver screen reader. It cannot be used without it by sighted users. The aim was to make it as simple as possible for blind users to use the built-in calendar and reminder functions of iOS. Like Fantastical, it makes use of data stored in other apps included with iOS. You can, therefore, share the data with other users of not only Fantastical, but any apps making use of the same data sources. You can share events with friends and family who can incorporate them into their own preferred calendars. Calendar events shared by others can also be incorporated into your own calendar.

What really sets this app apart is the screen layout and ability to summarize your events so you don't need to go through them one by one. The screen is divided in two halves, so you can use one hand to scan events and your other hand to tap and activate things. If you prefer, you may also use ordinary VoiceOver gestures to operate the app. Those who find it hard to master typing can record events thanks to Vo Calendar being able to tie into the Voice Memo app included in iOS. You can hear events in your own voice.

Due to my skill level with VoiceOver, I felt no need to acquire VO Calendar. It doesn't really offer anything other than

greatly simplifying calendar and reminder tasks. Others could easily come to the completely opposite conclusion, especially if they struggle to use the touchscreen in general. The work that has gone into minimizing the need for navigation is somewhat lost on me. However, for people just getting started or those who have motion difficulties, it could make all the difference.

Personal Diary and Day One Journal

Keeping a personal diary can certainly be accomplished using the Notes app. However, if you're after a tool that is specifically designed for keeping a personal journal, you're in luck. There are many journaling apps in the app store. There are two personal journaling apps that stand out as being accessible for blind users and have stood the test of time. Personal Diary developed by Eng Tat Lim is a completely free diary app that is fully accessible with VoiceOver. Things are kept very simple. There are no ads or in app purchases. It's just a very simple secure diary app, which still receives regular updates and improvements. It features a companion app for people who have Apple Watches. In contrast, for people who want all the bells and whistles, there's Day One Journal developed by Bloom Built Inc. You can attach all sorts of things including audio recordings, photos, videos, and more to your entries. The free version is very generous with its feature set offering most

capabilities an average diarist would need. You are, however, limited to a single journal of unlimited size. For people wanting more, you can subscribe to the premium plan and enjoy an unlimited number of journals among many other benefits. You can read more about what Day One Journal has to offer by visiting www.dayoneapp.com.

Westminster Chimes Full

The clock is great for basic use. However, many blind people would very much like to be reminded of the time by hourly chimes or tactile vibration. I have yet to hear of an app that gives tactile feedback helpful for keeping track of time. The Apple Watch will do this but purchasing one for this ability alone seems crazy. However, my Twitter followers pointed me to Westminster Chimes Full, a \$1.39 app made by LutherSoft. This gives audible chimes in five different traditional English styles. The app fully supports VoiceOver and is quite simple to use. The developers are well aware of VoiceOver and have taken steps to make their app fully accessible. Even beginners will have little difficulty setting the chimes how they prefer.

Timeglass

For timers with more capabilities, I have an app called Timeglass. I can build more intricate multi-stage timers with that app. For instance, I schedule work time and breaks for when

I'm working on these notes, blog entries, or my guide. It has the ability to construct timers with multiple stages that can have spoken or sound cues. As I go through my work time, I hear signals letting me know when it's time to take a break. The app includes many premade timers for everything from doing laundry to safely cooling beer in the freezer. How epically thoughtful is that? Some timers can be had for free. However, to unlock the full functionality of the app requires an in-app purchase. To complete this, you'll need your Apple ID and password plus around \$6 in available funds.

Benefits of Your Device During the COVID-19 Crisis

When I started this project back in 2016, the farthest thing from my mind was that we would be in the early stages of a global pandemic as I finished it in April of 2020. The COVID-19 virus has caused massive changes in how life is lived in Canada as well as other countries around the world. All of a sudden, self-isolation and physical distancing are the watchwords of the day. Being able to order groceries online and use social media to stay connected with others have become truly vital skills. Presuming you can master the skills required to use your iOS device, it can prove very helpful in many different ways that are quite relevant to the situation. These include staying connected with family and friends, and keeping you informed of the latest policy changes, discoveries, and current events. Games, podcasts, streamed videos, and creative projects can help you pass time on your own more pleasantly. Apps and websites make it possible to order groceries and supplies online, greatly reducing the need to leave home. Also, thanks largely to the camera and some innovative apps, your device can enable sighted people to help you from the safety of their own home.

You'll find extensive sections of this guide devoted to each of these things. Indeed, I have placed this section here just after the sections on the app store and the one describing

how to put the camera in your device to good use. Presuming you read enough of the preceding material, you'll know enough to see the potential possibilities I discuss briefly in this section.

Staying Healthy

Until this crisis began, I had only dabbled in this area, trying out various workout apps. I wouldn't have even dreamed of using an app to keep track of the calories I ate each day. It all seemed like way too much bother. However, once all semblance of normal routine is tossed out the window, safeguards against binge snacking and routines to keep active become more attractive things. Looking ahead towards potentially a whole summer of similar days in my apartment, one blurring into the next, I decided to take health more seriously.

Presuming you have an iPhone or iPod, it will come with a built-in accelerometer that allows it to count steps while the device is in your pocket. For better activity tracking, there are a number of compatible fitness devices available. This isn't an area where I feel at all an expert in. There may well be less expensive options than what I chose that can interface with accessible apps. Deciding to stick to something I knew would be accessible right out of the box, I ordered a Series 3 Apple Watch. I don't usually like to be this far behind what's current. However, it was at the limit of what I felt I could

spend on a concept I had some doubts would ultimately be something I would stick with. Already though, I've gotten into the habit of putting it on each morning and recharging it nightly. I'm finding it to be very helpful keeping me accountable and more motivated to do the workouts.

What workouts would those be? Well for starters, I sideloaded some of the Blind Alive workouts into the Castro podcast app. You can find these workouts on YouTube. Look in the Eyes-Free Fitness channel, and you'll find all of the workouts freely available. You can also find them at www.blindalive.com.

They're well described, since they were designed for blind people right from the start. You can download the workouts directly from the website as MP3 files that can be played in numerous different apps obtainable from the app store including Voice Dream Reader. In addition to the MP3 files, you can also find text descriptions of the various exercises. If you go the YouTube route, you'll need to find an app to capture the audio or simply stream the workouts when you need them.

I also use the CARROT Fit, CARROT Hunger, and Zombies, Run apps. CARROT Fit takes you through 7-minute workouts with plenty of geeky snark. CARROT Hunger keeps you accountable regarding the calories you eat. Zombies, Run! combines walking or running with audio drama adventure. There are seven seasons of the core

Zombies Run story that also involves you keeping the base defenses in good shape. You can also play a growing number of additional stories. All of these apps are fully accessible. So are the apps connected to the Apple Watch. All of the data collected goes into the Health app. This way, you don't have to worry about updating each app with whatever workout you did in another app.

When it comes to going for walks, I use the BlindSquare app. I have a manmade lake with a path I can walk around pretty safely. The GPS information from BlindSquare includes landmarks like benches, gates, exercise stations and other things that I put in with help from O and M instructors. That makes it possible to avoid touching things more than I otherwise might. It also keeps me on track and makes certain that if I do become lost, I can use it to get back home. I use Aftershokz bone conduction headphones that don't interfere with my hearing aids. I always wash my hands right away when I get back home. The CARROT Weather and Weather Gods apps can keep me informed about conditions outside. Too much wind can neutralize my hearing aids, so I have to keep that in mind.

Staying Connected with Friends and Family

All of a sudden, everything is happening online. Social media has suddenly become vital rather than being seen as a

distraction from "real" in-person relationships. I find myself engaging more with it these days. Even Facebook, which I've never really warmed to. I try to check it more frequently since many of my friends and family make use of it exclusively.

Twitter is more my style. I'm on that quite a bit, mainly seeing what others post, but pitching in when I can meaningfully do so. I tend to find out about a lot of things through Twitter. It's also a useful platform for offering quick assistance to the technically challenged. Questions can be asked publicly and then followed up with more lengthy private messages back and forth to resolve issues.

Zoom has become a very important app for accessible group meetings these days. I'm attending more meetings with people from my church as well as blindness groups. I've attended more Zoom meetings in the past couple of months than I did in the preceding year. For an excellent audio book about Zoom Cloud Meeting, you should pay a visit to www.mosen.org.

FaceTime lets me ask my sighted friends and family to help from a safe distance. When my credit card expired, I asked my father to read the CVV number on the back of the card. So far, I haven't had occasion to use the Be My Eyes or Aira services. I pretty much know what and where everything is in my apartment. However, I'm very happy to know that I can use those services if

I need them. I would have felt safe using Aira for getting that CVV number, since they vet and train their agents. On the other hand, you never have to pay for the help of Be My Eyes volunteers, so I might use them if I had to do something that didn't deal with sensitive information but would likely take longer than the five minutes Aira lets you use for free. I haven't needed to sign up for one of Aira's plans. I'm very thankful that both of these services are available for people who might not have the awesome friends and family that I'm blessed with. There are so many appliances and things that aren't very accessible without sighted assistance. Our air conditioner's control panel is a perfect example where a service like Aira or Be My Eyes comes in very handy indeed.

Internet radio shows and social media are also a great way of keeping in touch and virtually spending time with people. Jonathan Mosen is a great example of someone who has built a community around his shows and his Mushroom FM station. Other large scale virtual events like the One World: Together At Home concert that was broadcast live on April 18th, could be listened to using your iPhone or iPad. I suspect we'll see more such virtual events over the coming weeks and months.

Being able to help others during this prolonged sort of crisis is very important to mental health and morale. Thanks

largely to email and social media platforms, I've found many opportunities to do this. There are lots of people who never shopped online until now when they've really needed to. I've helped my mom order groceries online for the first time. Some people from my church have needed patient help with their iPhones and iPads. I've been able to do some of that. Also, I know about what's available online and can steer people towards resources that they don't know about. I've done quite a lot of that lately. It's something a lot of blind people can do. I hope that those who read and learn from this guide will take up that torch and offer whatever expertise you might have.

Keeping Informed

There are plenty of ways to keep up with what's happening. For starters, people should get the Canada COVID-19 app from the app store. It's developed by Health Canada in partnership with Thrive to help Canadians in this crisis. Health agencies in other countries are also producing these apps. The app has a self-assessment tool that asks you if you've experienced any symptoms of the virus. It also has updated information and advice from Health Canada. it's far from a perfect app, but it's quite accessible for the most part.

The CBC Listen app gets extensive use every day. Sara and I often listen to updates together on the actual radio we have in

the apartment. However, with both of us working on projects, there are times when one of us is busy or just doesn't want to hear anything COVID related. The CBC Listen app also lets you catch shows you missed at your own convenience. I have to give a shout out to everyone involved with CBC Radio. They've done a truly magnificent job keeping people inspired, informed, and entertained. I've taken great hope and courage hearing about how others are coping with self-isolation and stepping up in many ways. When you're essentially stuck in one place, it does a world of good to hear what's going on elsewhere, as people all over the world do what they can to fight the virus and keep sane while doing so.

I'm also making frequent use of the Apple News app. I've found it tremendously valuable in following stories from different perspectives. Handling and organizing articles from so many sources, it offers me a variety of perspectives on issues that interest me.

Keeping Entertained

Being able to set aside grim reality is an important aspect of maintaining one's equilibrium. My tendency is to turn to a good book. I read a lot of books mostly using Kindle, Voice Dream Reader, and Audible. I have a very large stockpile of books running into the thousands. Recently, I've finished

Atlantic by Simon Winchester. Erin Morgenstern's *The Starless Sea* has also kept me entertained. Somehow though, despite a vast supply of books yet to be read, I keep finding myself listening to Stephen King's *The Stand* for at least the tenth time in my life. Go figure.

Netflix, YouTube, and a whole bunch of podcasts are also keeping my mind busy. There's absolutely no shortage of interesting things to listen to. Even if production of new material were to stop tomorrow, I'd be fine for ages. You'll find lots of recommendations scattered throughout the rest of this guide.

And then, there are games. I've played plenty of *Lost Cities* and *Feer*. I've found story games somewhat harder to focus on these days, as I bring this guide to a finish and take in all the rapid historic changes happening. I've really learned the value of less complex games.

When you just need to really detach and unwind, I've found solace in listening to stations and playlists in the Music app. Plenty of great songs and lots of instrumental stuff. I'm also very thankful for soundscape apps like *myNoise*, *Naturespace*, and a new one called *Soundscapes*. Being able to hear different places really helps with the cabin fever.

Pandemic Reflections

I hope this small section serves to illustrate the many uses of your device during a crisis requiring you to avoid close contact with people as much as possible. Perhaps, it will also serve to encourage donation of such devices to blind people who cannot otherwise afford them. There are doubtless other uses that I have yet to discover in these early days of the pandemic. I write these words in mid April of 2020. Measures that drastically effected the lives of millions only began a month ago. Strange to think that a device not much larger than the palm of my hand now serves in so many capacities.

Nothing can replace being free to get outside and be with people. However, I'm very grateful for the options afforded me by current technology. These soundscapes, virtual events, Cloud meetings and things are far better than nothing at all. If there's one thing I hope people take away from this time apart, it's that you only shoot yourself in the foot shunning technology that allows us to connect when it would otherwise be dangerous to do so.

As blind people, we should use the connective powers these devices give us to reach out and offer our own knowledge, ability, and talent in the service of others. Beyond completing this guide, I have also been helping friends, family, and others

cope with aspects of the online world they had previously had no use for. Good and patient listening, careful consideration, and time are all things that we, as blind people, can bring to the table. This ability to contribute meaningfully can bring us a valuable sense of being a helpful part of things in these uncertain times.

Going Dotty: Refreshable Braille on iOS Devices

I never really appreciated what a gift to organized thought that learning to read Braille was while receiving my own education. Braille was always bulky and heavy. The army surplus backpack I carried through the halls earned me the nickname of "Fifty". People thought that it either had fifty things in it or else it weighed fifty pounds. If they were too close behind me while I turned a corner in the hallways of my school, they were liable to get crushed up against a wall. I doubt any of them suspected that the Braille volumes that added most of the weight to that pack were mere fractions of the textbooks and novels they could easily carry whole under an arm or in a pocket. In early grade school, the class of blind students I was in made use of a copy of the *American Vest Pocket Dictionary*. It was comprised of seven thick volumes despite the pages being double-sided Braille. Each volume was thicker than a phone book, and the whole dictionary completely filled a long shelf stretching across a wall. For years, I thought the title was someone's idea of a joke. Eventually, on a pure whim, I asked to feel a dictionary carried by one of my sighted classmates. You couldn't quite stick it casually inside a pocket, but it was light and easily carried in hand. For the first time in my memory, I was

brought up against the reality of what a profound and massive difference having eyesight could actually make in one's life.

There's also the cost of producing Braille to consider. I walked around grade school with a solid metal contraption somewhat like a typewriter. It was a Perkins Braille writer that weighed around fifteen pounds and cost at least fifteen hundred dollars. Braille embossers designed for mass production are even more expensive. This has drastically restricted what is made available for blind people to read. The paperback book you can buy for under \$10 would cost hundreds to produce in Braille. Until audiobooks and ebooks recently hit their stride, I've been quite restricted in my reading choices compared to a person who had eyesight.

I'm part of a generation who has learned Braille naturally as part of my school experience, while there was really no other credible alternative. However, we have now been liberated from the cost, bulk, and weight of Braille by the advent of synthetic speech and more widespread accessibility to mainstream ebooks and computing. In everyday life, now that I know how to read, I haven't felt the need to constantly use Braille. Quite the opposite, in fact. While reading for entertainment and even when referring to books as references, speech output has proved more than sufficient and ever so convenient.

While I can fully appreciate why one might think Braille was no longer needed, I would contend that mastering the art of reading is essential to everyone's education, be that print or Braille. If sighted parents faced the prospect of their children not being taught to read and write due to a lack of resources, they'd be horrified and never stand for it. Parents of blind children should feel no qualms about insisting on Braille literacy. The many lessons I learned while gaining literacy have served me well in countless ways. Like riding a bicycle, literacy is one of those things you never forget even if you don't read Braille beyond signs and labels for years. The lessons it teaches about proper use of punctuation, sentence structure, and other aspects of writing have stayed with me. As a result, I have been able to use my writing and language skills to help others and express my thoughts clearly and with confidence.

I was never a particularly fast Braille reader and don't feel I've lost what speed I achieved. The same applies to writing. I'm far faster on a QWERTY keyboard than I ever was on a Braille one. In most circumstances, text-to-speech access has proved far superior in terms of portability and actual access to books. Other than my spelling having deteriorated over the years, I don't feel that the absence of Braille has done me much

harm. And yet, I'm profoundly thankful that I was taught Braille reading and writing. The lack of actual literacy would have had a strongly negative impact on my quality of life. Now that you have an idea where I sit in the great Braille debate, let's continue.

Who would have thought that a device with a smooth surface might prove to be an amazing conduit for Braille? Apparently, Apple did. Right from the start when VoiceOver first appeared, there has been support for Braille displays. I never thought much about it when I got my iPhone 4. It was so intuitive and easy to use speech, and the capabilities of the platform made learning how to use Braille on it far less attractive than it would be currently. Before embarking on writing this guide, I hadn't given the implications a whole lot of thought. As I've taken the time to dig into what iOS offers in terms of Braille support, the implications become very apparent.

You may wonder why I've chosen to give the Braille experience its own somewhat lengthy section. I have several reasons for doing this. First of all, if people don't intend to use Braille displays, all of the extra commands are out of their way. Those who wish to learn how to use refreshable Braille will find all they need in this section that isn't covered elsewhere. Experiencing iOS through a refreshable Braille display is

markedly different than via the touchscreen and speech output. Rather than a whole screen surface that can be explored with a finger plus immediate speech feedback, using a Braille display may change your approach. You can explore the screen in a similar way with one hand operating the iOS device and another on the Braille display. Alternatively, you could operate entirely from the Braille display using all the key commands to navigate. That will feel very different and be more similar to using a traditional screen reader. People who struggle with using a touchscreen may well find this mode of operation to be preferable. In either case, you will find that the Braille display gives you a window in the form of a line of characters whose length depends on that of your display. The position in exact focus, such as the current character in a document being written, is shown by two dots on the bottom of the cell that tick up and down repeatedly.

Another advantage to separating the Braille-specific information in this way is that people can more easily grasp how much support there is and how integral Braille can be if you wish or need it to. Those who might think to presume that Apple has paid mere lip service to Braille support do Apple and themselves a serious injustice. There's a whole lot of ground to cover, so let's begin connecting the dots.

Over time, Apple has gone to considerable lengths to support the use of refreshable Braille with its devices. In fact, it's possible to purchase a Braille display from the Apple Store app for your iOS device. If you already have a Braille display or a Braille notetaker capable of being used as a display and connecting via Bluetooth, you can pair it with your iOS device. VoiceOver has been designed to allow complete access via Braille throughout the operating system. While you can't completely avoid using the touchscreen, you can certainly minimize the need to. Doing this requires the learning of commands making use of key combinations or other buttons that your Braille display may have.

iOS has support that allows far more than simple Braille input and output. Similar to an ordinary Bluetooth keyboard, you can take full control of your device using only your Braille display. There are key commands to do everything you can do with gestures. If you can memorize the commands, you could have excellent and accurate control of your device. This includes things like summoning Siri, controlling the volume, and much more, all without lifting your fingers from your Braille display.

The catch is that there are a heaping ton of commands to know if you want that kind of complete control. People may find

that these commands feel less intuitive and easy to learn than the touchscreen gestures they are designed to replace.

Personally, I find a middle of the road approach works best where I still use the onscreen gestures but learn the commands of particular use to me.

Bye-bye Braille Book Bulk!

Ebook sellers are starting to get onboard, making certain that the apps everyone uses to read them offer support for accessibility. What this means for someone with an iOS device and Braille display is that they are completely liberated in their choice of reading. Braille books used to take hours and hours to translate and be very costly to produce. They also used to weigh quite a bit and take up a lot of space. I mentioned a vest pocket dictionary earlier that serves as a perfect example. Now, that same dictionary would take up a tiny fraction of the data storage available on even the cheapest iPhone. A Braille display that you could comfortably carry in one hand would let you access that dictionary and thousands of other books on your iPhone in perfectly readable and translated Braille.

One thing to keep in mind is that the apps you'll use to read these books are designed for people who can see. They're fully accessible, but things are done in such a way as to maximize reading pleasure for people who can take in a lot of a

page at once. Current Braille displays only present one line of text at a time. There may occasionally be slight problems as the apps and book formats are updated over time. Also, it may be easier to use the touchscreen when accessing menus and other functions that reading apps have. For instance, it's far quicker to learn the locations of tabs across the bottom of the screen or use menus that appear when you double tap on the screen. In exchange for putting up with these small issues, you can read damned near anything you want as soon as it's published and at the same cost as anybody else who buys and ebook.

Always a Catch: Pitfalls to Consider with Braille and iOS

There are some possible trouble spots for those who choose to acquire a Braille display and iOS device rather than opt for a more traditional Braille notetaker or other solution made especially for blind people. There may be times when your Braille display will disconnect, since the Bluetooth software is always trying to save battery power. If this happens, simply lock the screen with the power button on your device and then unlock it again. This should result in your display reconnecting. Some displays can be more problematic and require more steps to get them reconnected. This kind of thing also happens with other Bluetooth devices such as keyboards or even Apple's own AirPods. The AirPods are designed to reconnect quite

quickly and do so automatically nearly all of the time. There are so many different Braille displays that having the same kind of Bluetooth reliability would be impossible. This is very similar to my having to press a button on my Aftershokz Trekz Titaniums to make them reconnect if I stop hearing things through them.

We saw an instance of another potentially major pitfall when iOS 11 was released. People who updated suddenly found that they couldn't enter text quickly on Braille displays. Words would simply be lost and not be recorded in the document or edit field on the iOS device. Because people's fingers were busy typing in Braille, they couldn't immediately realize there was a problem if they weren't also using speech. You can't read Braille while you're in the act of typing it. Muting speech while using a Braille display is a very common practice. The issue was reported by testers but not addressed prior to the release of the update. Braille display users would be a very small percentage of the overall number of users of iOS. Every so often, their issues won't be dealt with in time and may take a while to address.

This happens with other things as well. It's not just a problem for blind people. At one point, an iOS update was released that resulted in iPhones being unable to make phone

calls. This problem was addressed extremely quickly as you might well imagine. However, it can be especially devastating if you rely completely on having Braille input, since issues in that area won't be regarded as being so dire. Apple tries to only release updates when enough improvements have accumulated that receiving the updates will be noticeably helpful to a good portion of users. This practice can leave things hanging for periods of time. It took around two months for things to be fixed so that people could type productively on their displays once again. That kind of delay could be especially inconvenient for students and employees who rely on having Braille access for input and output.

I can also use speech, so Braille isn't absolutely essential for me currently. However, if you're utterly reliant on Braille working correctly, keep in mind that there may be periods of time where things don't go smoothly. iOS is a very complex operating system. The more unusual your particular needs are, the higher the chance that problems like the example above will be encountered for hopefully short periods of time. Apple has learned from these mistakes and has introduced public testing of upcoming iOS updates in an attempt to catch major issues.

When looking for pitfalls, I spent some time putting myself in the worst possible case. For people who are deaf-blind, Braille had better work because there's no other way. If you absolutely can't hear speech or see enlarged print, touch is your only pipeline of information. In such circumstances, you may well want to look for alternatives or have a backup plan such as sighted assistance if things go wrong.

There are some things that might require sighted assistance to resolve. Certainly, you'd need such help to set up your device and then connect your Braille display initially. I don't believe there's any way to get at the Braille settings in VoiceOver until after the setup process is complete. Another thing that might be troublesome at first is entering your passcode to unlock your device. I have an older Focus 40 display, so more current displays may simply allow you to type in the passcode on them. Mine didn't, so I had to enter it using standard typing mode on the touchscreen. I had one hand on the Braille display, feeling which number was highlighted as I used my other hand to find and then enter the numbers using the split tap method. This is the best way I've found for making certain you enter the passcode correctly. You can, of course, find the delete key at the bottom right of the virtual number pad on the touchscreen and get rid of mistakes. I found this process

somewhat nerve-racking without speech output, but I think it would become second nature after a while. There's really no avoiding the need to enter the passcode every so often and after any time you shut down and turn on the device. Once that's been done, you can then use easier methods to unlock your device most of the time like Touch ID or Face ID.

While Braille focus will jump to where new messages are displayed, other things such as choices or controls may need to be more actively searched for by Braille users. Everything will be reachable, but without such proactive exploration on your part, you might not realize there are choices or controls present in some apps. The ability to actively explore the screen is a key part of iOS accessibility that works differently from other screen readers that may look for and announce more things automatically.

Mainstream Economics and Wider Horizons: Advantages of iOS Over Traditional Braille Solutions Tailored for Blind People

There are several advantages that iOS devices bring to the table for blind people wanting to make use of Braille in daily life. Braille notetakers work extremely reliably and typically have excellent battery longevity. However, they are also very limited in what they can do. They offer a set number of highly perfected functions that work flawlessly, but they don't offer

much ability to grow beyond those. On the other hand, iOS gives you very good but sometimes imperfect access to an ever expanding ecosystem of apps, ebook markets, and other things available to sighted people. Even though only a fraction of the total apps available for iOS are accessible to blind people, that still far surpasses anything you'll find elsewhere other than perhaps on Android devices. No Braille notetaker will let you do your shopping and banking with apps designed by the bank and grocery company you and potentially millions of sighted customers select. This access to the same apps used by sighted people could be very helpful socially to blind students and other Braille users. It's an option they've never really had before the iPhone gained its VoiceOver screen reader. You could read news articles on an app or website in Braille while talking about them with friends. And then, there are the specialized apps that take advantage of hardware built into your iOS device. Presuming you opt for a small portable Braille display, you could use an app like KNFB Reader to take pictures of the pages of a restaurant menu and then read it in Braille while conversing with your dining companions. There are all kinds of situations like that where you want access to information but also want your ears free.

Braille is especially useful when it comes to the study of Mathematics. It can be tremendously hard to picture how an equation is laid out while using synthetic speech. A Braille display supported with software such as the VoiceOver screen reader will let blind students and others feel the positions of part of equations. This can make solving them a far easier process. There are other instances where having the ability to feel the position of information is critical such as when examining charts or tables. How practical that is will depend on the length of your Braille display or feeling a table one-handed while the other hand is reading the Braille display.

Braille displays are very costly items and are built to last. I've had the same Focus 40 display since I got my first iPhone in 2010, and it still works great in 2018 with my current iPhone 7. Barring disaster, I expect my display to see me through potentially five to ten more years. The core of my system is my iPhone, and I can have the latest features without upgrading the far more expensive Braille component. Also, I can use my display with more than one device. If something happens to my iPhone, I could still use the display with my iPad, for instance. If your notetaker breaks down, you need to repair or replace a very expensive device and be without all of its

functions while you're taking care of that. If my display breaks, I still have my iOS device that can be used with speech.

If you already have a Braille notetaker, fear not. Most of them can connect via Bluetooth and act as Braille displays for iOS. You have the best of both worlds. Some notetakers are designed to integrate with apps on iOS devices, making them an even more powerful combination.

Attention Please: When Notifications Pop Up

You're reading along when all of a sudden, the Weather Gods app decides to reveal that it's raining heavily outside. Perhaps, a friend has chosen to send a message asking how you're doing. Unless you have your device on Do Not Disturb or have Notifications turned off, you will eventually be interrupted from whatever you might be doing by a notification from another app running in the background. In such a case, the same sort of thing happens with the focus of Braille as happens with speech. The interrupting notification automatically gets focus for a short time that you can determine before focus returns to what you were doing. Also, if you pan through the notification while it has focus, you should be able to read it in an unhurried manner. Remember that if they do disappear on you, you can always find them in the Notifications Center.

Commonly Used Commands

This guide won't go through every single command. The set of commands available to you depends on which Braille display you're using. The place you want to reach is a page called Braille Displays Supported by iPhone, iPad and iPod Touch. Below that heading, you'll find a series of links to specific Braille display command lists. Additionally, below this, you'll find a link to a set of universal commands that should work on any display. At the time of this writing, this helpful resource can be found at <https://support.apple.com/en-us/HT202514>.

The lists of Braille Commands are comprehensive, well-organized lists divided into headings and tables. Apple might change one or more of these commands at any time, so it's best to get them directly from Apple's own documentation. However, this subsection should go through the commands you'll need to start trying things out.

Most Braille displays come equipped with some basic control buttons or other things like wheels or rocker switches. These minimize the need to take your hands off the display to control the computer it is connected to. Pretty much all displays include a Braille keyboard to facilitate input. Presuming you've gotten your display paired, you should feel Braille pop up as you move your finger over the screen. The controls on your

display should do what the instructions that came with your display indicate. For instance, panning buttons will move left or right through text. Navigation rocker switches and advance bars should behave in logical ways. To start finding out what all the buttons do, you can use the keyboard help command, which is the spacebar plus the letter "k" (dots 1 and 3). Think of the spacebar like a control key. Once you've entered keyboard help mode, try other spacebar and character combinations. You will be told via speech what they are. This also applies to any other controls on your particular Braille display. VoiceOver has full support for at least 70 different Braille displays at the time this guide is being written in 2019. Even if your display only has a Braille keyboard, there will be enough spacebar key combinations for you to control your iOS device with reasonable proficiency.

Navigating Important iOS Areas

Any time you want to reach the home screens, just use the spacebar and letter "h" (dots 1,2, and 5). This should work from anywhere in iOS. While on the home screen, you can start typing in the name of an app you want to get to, and matching items will appear in a list that can be quickly scrolled through. You can scroll through this list or through all apps on the current

home screen in order via the spacebar plus dot 1 for previous, or spacebar plus dot 4 for next item.

Braille Settings in VoiceOver

Within the settings for VoiceOver in Accessibility settings, you'll find a subgroup simply called Braille. The VoiceOver screen reader is doing all the thinking while your ultra-expensive Braille display simply moves dots up and down in perfect obedience. Your overall experience should be similar regardless of which display you use. This certainly holds true for the group of settings we'll discuss now. However, be aware that there is another group of settings called Braille Commands we will discuss later that allows for total customization of what buttons and key combinations you enter on your Braille display will do.

These settings let you set things such as the particular code of Braille to be used with input and output. For instance, you might want six-dot uncontracted Braille for input and contracted Braille for output. You may not want to use UEB Braille if you aren't yet familiar with it. That's perfectly possible. Also, you can choose whether you want word rap on or off. Word rap determines whether lines end with the last possible entire word or whether they can contain the beginning of a word completed on the next line. You can also decide

whether or not to have the panning buttons automatically proceed to the next page when you reach a page boundary and pan further.

Connecting a Braille Display

The first thing to do is pair your Braille display with your iOS device. Make certain the Braille display is ready to be paired via Bluetooth, and then flick right through the Braille settings until you come to Choose a Braille Display. You should then find a list of any detected Braille displays. Be careful, since it may think ordinary keyboards are Braille displays. When you come to the name of your display, double tap on it to initiate pairing. You may be asked to enter a PIN number using the Braille display to help secure the pairing and make certain input coming from the display is recognized as that. There may be other Bluetooth devices connected to your device or operating close by. The number you enter sets up a secure and easily identifiable connection. Once a display has been paired, you shouldn't have to go through this process again in normal circumstances. If your display loses connection, simply locking the screen and unlocking it again should restore the connection.

After you have successfully paired your display, the Braille on it should change as you move your finger around the screen. It will be showing the labels of apps or information on the screen as Braille when you touch it.

Braille Screen Input

You need not have a Braille display for Braille to be a part of your iOS experience. The Braille Screen Input lets you use a virtual Braille keyboard by positioning your fingers on the touchscreen as if you were writing on a braille writer. You need to enable the option in the VoiceOver rotor settings. The dot position can be calibrated to your natural finger positions on the screen surface. This kind of input can be very useful, and people may find it easier than dealing with the ordinary onscreen keyboard. The Braille Screen Input setting lets you customize whether you want contracted or uncontracted Braille. You can also decide to reverse the positions of the outer dots so dots three and six are closest to the imaginary spacebar rather than have the dot numbers increase the farther away from the spacebar you get as they traditionally do.

Status Cells

You can choose to have a cell on your display be used for showing status information rather than a character of normal output. Each dot in that cell indicates something such as that your battery is low, there is more text on the current line, a message awaits your attention, etc. You can choose whether the status cell is on the left or right side of the display. You also may choose whether it shows general information like I

described above or text information such as format, font, etc. for the current character. This would be useful when writing a document. If you're using a status cell, you can turn the rotor to a status cell setting and flick up or down to find out what each dot on the cell means.

Math and Equations

There is a setting where you can choose whether Nemeth Code is used for equations. Increasingly, ebooks and other documents that contain mathematical equations are accessible through reading apps and VoiceOver. If you encounter mathematical equations while using a Braille display, one of the settings deals with whether you want the Nemeth Code designed to represent mathematics in Braille to be used.

Word Wrap

Because iOS has full control of formatting what is sent to your Braille display, it can decide when lines end. The word wrap setting lets you choose whether words rap neatly onto lines or whether a line can end with a partial word that's completed on the next line when you pan over. The first choice may help to clarify all words encountered at the end of lines. However, the other choice, which allows lines to contain all possible text that can be accommodated by your Braille display, may allow for faster reading.

Crossing Page Boundaries

Another setting lets you choose whether panning over a page boundary automatically moves onto the next or previous page. I have it automatically advance but can appreciate the utility of having panning stop at page boundaries. Keep in mind that some ebooks don't always give you printed page position. Kindle books provide a location number that you can use to instantly jump to a precise position if you know the number.

Input, Output, and Braille Codes

There are different styles of Braille much as there are different forms of writing. Depending on when and how people learn Braille, their needs and comfort with the various forms will be different. The input and output settings let you choose whether you want six-dot, eight-dot, contracted, or uncontracted Braille. iOS can support any of those choices quite well. You can also switch between these modes as needed. You might, for instance, wish to read in contracted six-dot Braille but write in uncontracted Braille.

In addition to the type of Braille, there is a separate setting from the input and output settings that lets you choose the overall code of Braille to be used. You can choose between US, UK, and UEB Braille codes. The UEB Braille code is the recently introduced code of Braille that Braille libraries all

over the English speaking world are now using to produce books. Thanks to the Marrakesh Treaty, this will allow institutions and library patrons to take advantage of books already produced elsewhere provided the countries have ratified the treaty. By eliminating the need to duplicate work already done elsewhere, institutions belonging to countries that have signed this treaty will free both time and money to broaden their selection of books. The ability to use this new code or, at the user's preference, the older US and UK Braille codes, lowers the bar for people who may not be familiar with the newer UEB code. They will still be able to read and enjoy the latest books in Braille provided they can afford to purchase them.

Hiding the Onscreen Keyboard

If you're not using the onscreen keyboard, you are able to hide it. This is useful if you're using a Bluetooth keyboard or a Braille display that typically has a built-in physical keyboard. A setting lets you choose whether the onscreen keyboard is shown or hidden. If you don't want the onscreen keyboard shown, that space will be repurposed and used to display more of whatever is on the screen such as a document or page.

Braille Commands: Taking Full Control Using a Braille Display

Controlling two separate devices at once can be taxing on the brain and on productivity. In iOS 11, Apple eliminated the need for this for people using Braille displays. There is a somewhat hidden group of settings that lets you customize what all of the key combinations and extra buttons on your Braille display will do. We will now explore this group of settings Apple has chosen to call Braille Commands.

To reach these options, you need to go into the VoiceOver settings and into the Braille subgroup of settings. Next, flick right through until you reach the Choose a Braille Display area. Flick right until you reach the More Info button to the right of the name of your display. Double tap on that. The very first button you come to in the More Info area will be Braille Commands. Double tap that and you'll have found your way in.

This seems like a strange place to stick such a powerful bunch of settings. However, it fits with how Apple has chosen to handle other Bluetooth devices. Beside any connected device in Bluetooth settings, there's a similar More Info button. Any connected Braille displays are Bluetooth devices, so they're keeping to an established pattern. This means that you can have a different series of commands for any additional Braille displays you might need to connect with. For instance, you might

have a different Braille display to use at work versus at home. In such a case, the correct set of Braille commands will be ready when you need them with no extra effort on your part.

There are seven categories of commands each with their own button. There are a good many commands, and most are rather self-explanatory. Rather than exhaustively going through each one, we'll take a quick tour of each of these areas. I'll give you an idea of what you'll find and why you might want to use what's there.

Braille

The Braille area is where you can set commands that relate directly to Braille control. For instance, you can set a specific key command like spacebar plus dots 5 and 6 to let you change quickly between output modes. This would be useful if you wanted to quickly go into uncontracted mode to feel how something was spelled and then go back into contracted mode. You may want to set a command to turn word wrap on and off depending on what you're reading. For quick progression through a novel, contracted Braille with word wrap off might be the best way to go. However, when editing a document, you may want uncontracted Braille with word wrap on. Setting up commands in this area lets you do that from wherever you may happen to be. Such key

combinations save you having to go all the way into Braille settings any time you want to do this.

Device

Let's say you're sitting on a bus listening to some nifty tunes when someone sits down beside you and says something. You could be rude and ignore him or her. Alternatively, you should pause the music. A third possibly preferable option might be to use the keys on your Braille display to turn down the volume on the music so you can hear both it and the person near you. That's the kind of thing the commands in this category are for. It's where you go to customize commands, letting you control your iOS device.

You can set the command that simulates pressing the Home button. Another might take you to the Control Center, the Notifications area, or summon Siri. There are commands that simulate rotating your device left and right. Others would let you easily adjust the volume using only your Braille display. All the while, your iPhone is safely tucked in your pocket.

Interaction

Sometimes, especially while using Braille, you don't want to take your hands off the display but need to perform a gesture such as a double tap. This area has commands that let you simulate doing things like a single or double tap. They allow

you to come up with commands on your display that eliminate the need to touch your iOS device to do simple things like a long press, use 3D Touch, etc. In normal circumstances, I find it easier to just touch my device and use the normal touchscreen gestures. However, if people struggle with using the touchscreen or have other hand mobility issues, these commands might make the difference between being able to use an iOS device or not. They offer a kind of precision that only a keyboard and numerous key commands can deliver. Given the relatively short time I've used a touchscreen extensively compared to the decades during which I dealt with my computer via such key combos, I'm gobsmacked at how positively old-school this now feels.

Keyboard

This area lets you set commands to perform special things such as selecting text, copying, cutting, deleting, etc. Options to perform these tasks would normally be present on the virtual keyboard. This lets you access these options right on your Braille display using commands that you choose yourself. Many apps include extensive toolbars with these sorts of options.

Navigation

This area lets you set up commands that help you move around. There are commands for moving to the next or previous line, paragraph, app, message, and much more. If you have an

iPad, there's even a command letting you switch between apps running on the same screen. If you want to get somewhere without having to use the touchscreen, this is definitely the category to visit and make use of.

Rotor

The rotor is so important that it has a separate area from the VoiceOver area right beside it. There are just five commands here: Next rotor option, previous rotor option, rotor up, Rotor down, and speak current rotor item. This will be especially welcome news for Braille users who have trouble with using the VoiceOver rotor gestures. People can use similar commands on a normal Bluetooth keyboard to control the rotor.

VoiceOver

In this last category, you can set commands letting you make use of VoiceOver functions. This includes turning the screen curtain on or off, opening VoiceOver settings, speaking hints, muting speech, and many more. These commands can be key combinations or use extra buttons on your display if this is more advantageous to you.

Making It Work: Controlling Apps with Your Braille Display

Now that we've theoretically covered how to set everything up, we'll discuss what it's like to control your iOS device using a Braille display. To get a proper sense of how things

work, we'll examine the Google News app and make use of it completely through the Braille display. This isn't how I normally operate. Ordinarily, I would use speech output or else use the touchscreen to control apps and my Braille display for reading. However, approaching things completely through the Braille display demonstrates the possibilities for taking full control should that be necessary or preferable for you. This is the only time in the guide where this will be demonstrated. All other instructions for using apps will presume that speech output and the touchscreen are used. The techniques demonstrated here should be sufficient to help Braille users figure out how to make use of the majority of other accessible apps. The app I have chosen is available in the app store and has stood the test of time. It is a third-party app developed by people who have used Apple's accessibility tools to include blind people. Google News is very highly regarded by blind users.

You will need to make use of the app store to acquire Google News. Searching the app store and obtaining apps are covered in detail elsewhere in this guide. One easy and quick approach is to invoke Siri and say "find Google News in the app store". You would then purchase the app by using the Get button and then completing the identification process that occurs whenever things are acquired in the iOS ecosystem. This is

explained more fully elsewhere in the guide. Let's proceed with the assumption that the Google News app is acquired and present on your iOS device.

Using Google News with a Braille Display

Google has produced a number of very useful apps for the iOS operating system. It has made certain that these apps offer support for users of the VoiceOver screen reader built into iOS. At the time this guide was being written in 2018, Canadians were still not able to make use of the News app produced by Apple. Alternatives are quite plentiful, but they don't come preinstalled with iOS. The Google News app should prove useful regardless of which country you happen to live in. It is also free to download and use. The more you use the Google News app, the more it learns about what you're interested in. This will affect the contents of your personal briefing, which is the section of the app that you start in upon opening it. To open Google News, find your way to the app and double tap on it. Alternatively, tell Siri to "launch Google News".

Panning Left and Right

You start out on the "personal briefing" screen. Try using the panning buttons on your display. One thing that becomes immediately apparent, especially if you're using speech output as well as Braille, is that more is read back to you via speech

than is obvious via Braille. The length of your display dictates how much is displayed at once. After the app has opened, it focusses on a title line that also happens to be a heading. This line indicates that you're in the personal briefing section and gives the user's name. That briefing contains the top five stories that Google believes will be of particular interest to you at the moment, and also has the current weather. That's too much information for most Braille displays. To read the rest of what you would hear and continue through the briefing, use the right panning button or key combination. You'll be using the left and right panning keys a great deal to look around. If you pan left as far as possible, you'll end up finding a Search button that wasn't spoken as the app opened up. It pays to explore. Spend some time on this initial screen getting the hang of panning around. Next, do the same with using the next and previous item button or key combinations. With the standard set of Braille key commands, these are spacebar plus dot 1 to go to a previous item or spacebar plus dot 4 to go to the next item. This is much faster than panning, since items may contain text requiring several presses of the panning button to go past. It also brings you to things such as "read more" links, buttons, and other things that might not be obviously functional given their text.

Getting Quickly to the Bottom or Top of Things

Let's suppose you want to get quickly to the top or bottom of a screen to then start exploring from that end of it. You'll eventually want to do this to get back to the top of a story you've read to reach the Back button to leave that story. You may want to reach the bottom of a screen to locate tabs so you can quickly get to another tab in the app. To do this, use the commands for reaching the top or bottom of screens. These are spacebar plus dots 1,2,3 to reach the top, or spacebar plus dots 4,5,6 to reach the bottom. Note the logical progression from the earlier previous and next item key combinations. There are helpful patterns such as this in the default set of commands that will aid you in mastering them.

During your explorations, you'll have come across a number of elements such as "read more" links, buttons like the Search button near the top of the app, and tabs leading to different areas. The Google News app is chock full of things like this, making it an excellent app to practice exploring with. To activate an item, use the key combination of the spacebar plus dots 3 and 6. This is the "activate" command and will cause any of the buttons, links, etc., to be interacted with provided you're directly upon them. Now, you can explore to any depth you wish when it comes to items discovered in the app. There will be

plenty of news and articles of interest for you to read and explore.

Search Me!

Remember that little Search button we found while panning around? That packs some serious finding power. We are, after all, talking about an app made by Google, which is world famous for its search capabilities. Make your way to that Search button, and then use the spacebar plus dots 3 and 6 combination to activate it. A new dialogue will appear. You will automatically be placed within an edit field where you can type in whatever words you wish. You can use the spacebar plus dots 3 and 6 activation command when you're finished typing to proceed to results matching your terms. You can then use the commands for panning and moving between next and previous items to look through these results. Use the activation key combination to select a result, and you will be taken to it. When finished, use the Back button to return to the list of search results. Pretty simple, isn't it?

Writing and Editing Using Braille

While you're typing in search terms, feel what's there after you've written a word or two. Below a cell in what you've written, notice a pulsing couple of dots presuming your display has eight-dot cells. These pulsing dots beneath a character are

used to indicate precisely where your cursor is so that you can edit effectively. The commands to edit a piece of writing comprise the rotor commands to move around and the delete key for removing what you don't want. The delete key using the default Braille command set is spacebar plus the letter "d", which is dots 1, 4, and 5. In iOS, remember that the character deleted is to the left of the delete key, so move one character to the right of whatever letter you wish to remove.

Rotor Turning by Remote Control

While editing larger documents or doing many other things, you would be using options on your rotor. A set of commands lets you turn the rotor without ever having touched your iOS device. While editing and writing text, you must use the rotor to move around by various amounts through text. The rotor also gives you options for selecting and operating on blocks of text. The Braille commands to turn the rotor are as follows:

Turn rotor left to previous item — Spacebar plus dots 2 and 3

Turn rotor right to next item — Spacebar plus dots 5 and 6

Flick up — Spacebar plus dot 3

Flick down — Spacebar plus dot 6

By default, there is no command to speak or display the currently selected rotor item, but you could set one up for yourself in the Braille Commands settings.

Concluding Thoughts About Refreshable Braille

Exploring the iOS operating system through the lens of its support for Braille has been an interesting journey. I came into this not knowing about most of what I discovered. Adding to my struggles was my lack of speed in both reading and writing Braille. I kept having a sense that things should have been quicker. Indeed, they are much quicker for people who are used to operating Braille displays with other screen readers or using Braille notetakers. People who are more proficient than I at reading and writing Braille will find a lot to like and take advantage of in terms of efficiency. I don't think they would find learning the commands and what various options do to be anywhere near as frustrating as I did.

While doing research for this section of the guide, I felt that it was important to approach people who used Braille with their iOS devices on a regular basis. I wanted to see if my intuitions on when and how they used Braille were correct and see what I had doubtless not thought of at all. I found more than one helpful forum thread on the AppleVis site. Many people have found using Braille displays very advantageous when they need their ears free for participating in conversations while operating their iOS devices. Also, while in noisy environments

where VoiceOver was hard to hear, Braille proved to be a very useful alternative.

Typing in Braille on a display was also quite often sighted as a distinct advantage rather than using the onscreen keyboard. One lady mentioned that she used text adventure games to improve her Braille typing in a less stressful way than doing homework and fretting over every mistake. Provided one is proficient enough, Braille can at times be even quicker than speech when it comes to reading or getting things done. Also, it leaves your ears free for listening to music while reading a good book.

Proofreading is another excellent use for Braille displays. Now that word processing has become practical on iOS, people are able to read their own writing, which can give a different sense of it than having it read to you. Formatting information can be conveyed without breaking the flow of reading by means of the status cell.

Braille is especially useful when it comes to the study of mathematics. It can be tremendously hard to picture how an equation is laid out while using synthetic speech. A Braille display supported with software such as the VoiceOver screen reader will let blind students and others feel the positions of parts of equations. This can make solving them a far easier process. There are other instances where having the ability to

feel the position of information is critical such as when examining charts or tables. How practical that is will depend on the length of your Braille display or feeling a table one-handed while the other hand is reading the Braille display.

There are well-designed Braille display cases that let you hang the display so it's in front of your chest. You can then make use of it more easily while on the move or even while standing. My wife Sara has a very old Braille notetaker that has such a case, letting her direct the choir of her church while referring to notes. Presuming you mastered the necessary commands, you could operate apps on an iPhone in your pocket without needing to hear it speak while having your display hanging at chest level, leaving your hands free for reading or other tasks. GPS apps might be operated using Braille in this manner while on the move. While recording the lecture series that accompanies this guide, I made use of a large 40-cell display on my lap along with some notes on my iPhone to keep me on track. Braille displays can be a powerful advantage when it comes to public speaking and presentations.

Overall, Apple has developed a remarkable and powerful platform for Braille users. This is especially true now that the ability to customize what buttons and key combinations on your Braille display will do. With that power comes the danger of

making a real mess of your interface. You might make so many changes that you forget what they all are and then discover that you can't remember what the original default options were. The only solution I've found that gets you back to square one would be to make use of the Forget This Device button in the More INFO area for your Braille display. You could then re-pair it, and the settings would all return to the default ones, since your customizations for the display would have been forgotten. At that point, you could begin to set custom commands again. The good news is that once you have a command set that you like, it should stay there until you use the Forget This Device button.

People may feel overwhelmed with the need to learn all of the various commands and options. I certainly did. Don't forget that it's never an either/or choice. You are always free to use the touchscreen gestures you may be far more comfortable and familiar with. I think the real strength of combining refreshable Braille and iOS is when you use some of the commands but mostly use the touchscreen gestures. You don't have to memorise and use all of the commands unless they work better for you.

One thing that I have tried and can't recommend was using a Bluetooth keyboard as well as a Braille display. I had a number of instances where this seems to have caused some confusion. I

found that the only way to fix this was to "forget" and then repair the Braille display with my iPhone. Thankfully, I hadn't customized a whole bunch of commands. Had I done so, this would have been quite frustrating. The majority of Braille displays have Braille keyboards included, and I suggest using those exclusively to avoid this setback.

Braille literacy isn't something that should just be thrown away. However, people who advocate for it need to make certain they come at the problem from realistic angles. One thing that I fervently hope happens is that opportunities to have fun using Braille are as strongly encouraged as possible. I learned how to type and use access technology largely by playing games. IOS presents some unique opportunities in that apps that support VoiceOver are also perfectly accessible to sighted people. Look for games that are text-based and not dependant on visual hand-eye coordination. I'll make some recommendations in the section of this guide dedicated to games and their benefits. There was a series of game books that did a lot to encourage young teens to read more than they were inclined to. It was called *Fighting Fantasy* and combined reading with choices and dice rolling. So far, the apps that are bringing these games into the modern digital age do not include support for VoiceOver. This shuts blind people out of games that they could otherwise play quite

easily. I would dearly love to see this situation change, and perhaps, have an organization fund the addition of accessibility to these games and other similar apps that are currently inaccessible. The excuse most frequently given for this state of affairs is that the app developers lack the funds to make this economically viable. If people really want to see Braille thrive, steps like making these sorts of games accessible could really help. I don't have many fun memories of Braille other than the occasional enjoyable book. That needs to change. I can easily envision multi-player party adventure, board and card games played on equal terms with sighted and blind players. iOS certainly allows for this, but nobody has yet taken up the challenge extensively. This should and could easily change. Over time, more companies will make their apps accessible to VoiceOver, and hence, to Braille users. Rather than having this Braille access be an accidental by-product, I would very much like to see such efforts funded and requested by blindness organizations on the lookout for opportunities for this kind of thing. There are many circumstances in both work and play where having our ears free to focus on what others are saying can be absolutely crucial. Those sorts of circumstances are where Braille can really have a meaningful impact even to people like myself who are used to speech output.

I have high hopes for greater Braille literacy thanks to the journey I've taken with Apple and Braille. It has drastically widened the scope of possibilities when it comes to the circumstances in which Braille might be used in modern life. We're still in the early stages of exploration. There are two sources of momentum that must come into play. The piece of this puzzle that Apple does not control are affordable Braille displays. As I write this guide, serious efforts are underway to lower the financial barrier to refreshable Braille. Initiatives like the Orbit Reader and Braille Me hope to dramatically lower the cost to individuals of reliable refreshable Braille. The second piece of the puzzle is somewhat under Apple's influence. It can take measures to facilitate and strongly encourage app developers to support VoiceOver accessibility when creating apps and to keep Braille users in mind. As more apps are made intentionally accessible to users of speech output and Braille, awareness will spread more widely, and things will get better. Future generations won't be driven away from using Braille for lack of portability and convenience. The case for inclusion has at last reached a kind of critical mass. There is a long way to go, and in the case of Braille, the brakes have been on for quite a while now. However, technology has now taken off those brakes, started the car, and started us moving again. There is

the potential to take Braille to some very innovative new places.

Voice Control: Say the Words and Make it Happen

One of the most anticipated features of iOS 13 falls squarely under the accessibility category. During the keynote presentation at the Worldwide Developer Conference in 2019, Voice Control was demonstrated. A man was seen to open apps, issue commands and edit text while dictating it all with his voice alone. The demonstration was a substantial part of the presentation and impressed the audience tremendously. There was a great deal of interest from all sorts of people wanting to control their iOS devices with their voices. There was instant and intense interest among blind users of iOS devices. Many blind people have some difficulties using touchscreen gestures and this could help reduce what they needed to know before being able to broadly use their devices.

Voice Control wasn't really conceived of with blind users in mind, let alone the average fully able sighted user. It was designed with the assumption that its users had mobility impairments that made it difficult or impossible for them to use the touchscreens of their devices beyond a very basic level, such as people with hand tremors or people who were paralyzed but who could speak clearly. The presumption was also that they could actually see the screen. Therefore, the only constant voice the system had to pay attention to was that of the user.

Presuming a blind user is using synthetic speech to read the screen, this immediately throws up a point of trouble. Voice Control recognizes the speech output of VoiceOver just as easily as it does the speech from the user. This basically means that blind people will need to use EarPods, AirPods, or a headset of some sort so that only they will hear the speech output from VoiceOver. It can't tell the difference between voices. Some accommodations were made to make Voice Control work better with VoiceOver. It was trained to recognize some VoiceOver commands such as "VoiceOver double tap". However, this was done late in the process. People who use Voice Control should start out with that understanding. This is still brand new territory for Apple. Interviews given during the conference to blind podcasters really tried to lower expectations regarding Voice Control, as it hadn't initially been conceived with blind people in mind. Only a small subset of VoiceOver commands has been added to Voice Control's vocabulary of commands. Further complicating matters, not all apps support Voice Control gestures. Attempting to read a Kindle book, I discovered to my surprise that I couldn't turn the pages of that book with the commands to scroll left and right. Meanwhile, the physical scrolling gestures worked perfectly. In these early days for this new capability, developers of apps will be experimenting with Voice Control and

considering whether it's worth their time and effort to support the feature properly in their apps.

I think it a virtual certainty that this less than ideal state of affairs will improve rapidly and not just for blind users. The appetite for Voice Control was keen among fully able users of iOS devices. Apple now realizes this and tends to try and satisfy such broadly felt wishes. Now that Apple has a sense of interest among its blind users for this kind of control, I expect they have already begun attempting to increase its usefulness in conjunction with VoiceOver. The difficulties I encountered as I wrote this section of the guide in late 2019 and early 2020 are likely to disappear long before this guide is anywhere near obsolete. Therefore, I would urge all blind users to give Voice Control a good try to see if it can be of more help to them than it was for me at the time I wrote this.

Think of Voice Control as a replacement for your keyboard or touchscreen. It is designed to use artificial intelligence to help understand your vocal commands, letting you control your device with your voice alone. Unlike Siri, it wasn't designed to actually find out answers to your questions or do tasks for you. The distinction may seem blurry for beginners who have used Siri, but it's important to keep the purposes of these separate voice-related tools clear to avoid frustration. When using Voice

Control, you're doing what you could otherwise do via the touchscreen. Presuming you're competent with VoiceOver gestures, you'll frankly find doing this to be much more productive than trying to use Voice Control to do everything. Given current circumstances as of early 2020, you really need to be able to use the touchscreen to make obtaining an iOS device worthwhile as a blind user. Turning on Voice Control doesn't make your iOS device a super powerful smart speaker that can understand your every vocally expressed wish.

Managing one's expectations is pretty important. Voice Control isn't as polished and well developed as VoiceOver is now. I worry that people who don't understand this will go in expecting to be perfectly understood and obeyed. This frankly isn't what will happen when you start giving orders and dictating documents. People with sight can react more quickly if things go wrong and take advantage of visual aids and commands that you'd need sight to use effectively. As blind people, we need to hear the consequences of being misunderstood before we realize the need for corrective measures. Also, we need to take time to hear what our options are, much like being on a phone using a company's spoken menus as you wait to hear which number to press to do this or that. Sighted people can simply perceive a grid of numbered options on their touchscreen and say the

number corresponding to that option. I hope this helps you begin to perceive the points of lost productivity and friction. Nobody should get an iOS device thinking that they can just use their voice and be at all efficient as blind users who have taken the time to master VoiceOver touchscreen gestures. Having hopefully made that clear, I will say that Voice Control can be a delightful convenience given the right circumstances.

Apple provides very limited instructions in its user guides about how to use Voice Control. It doesn't provide any instructions on how best to use Voice Control at the same time as VoiceOver. For that, people who are interested should be certain to check on AppleVis for guides and podcasts and such. There is some discussion on Voice Control in the forums, as well as an excellent introductory podcast on the topic. Remember that this capability is brand new to iOS 13 and more guidance is likely to appear as the feature improves and as more blind people gain increased experience with it.

What Voice Control Understands

Let's be clear. Voice Control makes use of Apple's artificial intelligence engine. This happens mostly right on your device but also takes advantage of Cloud-based artificial intelligence. This way, it can even work while you aren't connected to the Internet, letting you dictate text and perform

other tasks that don't require you to be online. This capability takes up around 250 megabytes of storage for the ability to understand your voice while offline. Its ability to understand a user's voice is an outgrowth of what Siri can do. Like Siri, Voice Control doesn't actually understand the context of the words it hears.

Voice Control has two modes of operation. Command mode is focused on understanding your orders, giving you as precise and intuitive control of your device as possible. You can say things like "next song", "open notes", "volume up", or "lock screen", controlling your device through command words and phrases. Extraneous talking, such as people conversing in the same space you occupy, shouldn't disrupt your ability to control your device very much, since only those command words and phrases will be acted upon. Meanwhile, dictation mode is concerned with optimizing the entry and editing of text. Words that aren't commands will be recognized and presumed to be text. This might be a document being worked on or text entered in a form field. Other special commands relative to editing text are made available while Dictation mode is being used. Be careful of any conversations taking place around you, as words may be added to edit fields that are in focus. At any time, you can say "go to sleep" if you want Voice Control not to act on anything it

hears. Before using it again, you need to say the phrase "wake up".

Configuring Voice Control

Apple built in a lot of voice commands but recognized that users would want to shape Voice Control by adding new ones or having more words recognized. This can be achieved through the Settings app. You'll find everything you need in the Voice Control settings that are, naturally enough, found in the Accessibility branch. The system can be customized quite a lot. To get to Voice Control settings, either tell Siri to take you there or go to Settings, Accessibility, Voice Control. These settings constitute the only place where you can configure Voice Control. There's no other app or anything like that.

There are two major settings for this. The first is a button called Customize Commands. This is where you can enable or disable commands as well as add new ones. The other major section is Vocabulary, which is where you can teach Voice Control to recognize more words. You type these words in and artificial intelligence can then recognize them without depending on voice samples from anybody who might want to use the words. The same goes if you're adding new commands. You type in the name of the command and then record the gesture or set of gestures you want the command to do.

It isn't easy to add new gesture commands as a blind user. This is one of the things Apple will have to work out better. If you're adding a gesture or gestures to be triggered when you say a phrase, there is a drawing area where you are supposed to perform gestures. Finding that drawing area is all too easy. The problem is that once you've made the gesture inside the drawing area, it's very tricky to find and double tap on the Save button located just beneath the status bar. With VoiceOver running, you often either accidentally tap within the gesture area wrecking what you've drawn there, or else tap in the zone that activates the slide down gesture to reach the Control Center and Notifications Center. I almost always have that happen.

Dictating and Editing Text

While in Dictation mode, you can speak text and it'll be entered instantly. You are also supposed to be able to give editing commands such as "delete that", "correct phrase", etc. However, I've never gotten this to work for me. It always ends up not doing what I want and leaving the commands I dictated in the text, which I would then have to edit out. I tried to dictate some of this guide section and found it very frustrating. Many of my editing commands were simply entered into the document as if they were text. Also, that whole issue of context raises its ugly head. I had to look carefully through

anything I dictated for misunderstandings that sounded close. For example, "come and" versus "command" versus "calm and". Think of all of the homonyms such as "their" and "there", and "to", "too", and "two", etc. The misinterpretations made while dictating could often only be detected through the use of careful character by character proofreading. You wouldn't necessarily realize that a mistake was made if you just heard it read aloud naturally. A sighted user would see immediately that he or she had been misunderstood and be able to immediately employ the available editing commands to address the situation.

Voice Control Settings

Besides the settings for adding your own vocabulary and customizing commands, you can determine what confirmation feedback you get when Voice Control receives a command. It can make a small chirp sound that is useful for blind users. Visual confirmation that it has received a command is also possible. Voice Control works in many different languages, and you can set which language Voice Control understands. There's another setting for Voice Control hints, which suggests possible commands given the current context. VoiceOver will read out those hints. You can also set whether you want Voice Control to wake up when you look at your device just like how Face ID attention works. This could be very useful for people who look

at their device to use it. You can also select from a number of overlay options.

Overlays

To help select commands, Voice Control has a number of possible choices for showing options. You can have a numbered grid displayed so you just have to say the correct number to issue a command. You can also display names of options and apps. This is more useful for blind people in my limited experience. The overlay flashes up on the screen on top of whatever else is there. You can have the overlay stay for a number of seconds or fade away after a while. VoiceOver continuously reads out the numbers or names if you have an overlay showing. It's almost like those voice menus on telephone banking or other phone systems.

Voice Control Reflections

Currently, I haven't found Voice Control to be all that spectacularly useful. It can be nice to simply say "pause music", "next song", etc., having these commands acted upon instantly without needing to invoke Siri or leave the app I'm in. I certainly recognize the potential of Voice Control to become much more useful even to touchscreen veterans like me as it matures. However, do keep in mind that I'm coming at this as a very experienced user of the touchscreen. People who really

struggle with the touchscreen may find Voice Control a good deal more beneficial than I do. For me, Voice Control really isn't all that useful when I could simply make the right gestures or type quickly and accurately on a physical keyboard and accomplish more, faster. Apple was quite right to downplay initial expectations for blind users. You need to be using earbuds or a headset so VoiceOver doesn't interfere by speaking out loud. Also, since we have to wait to hear what happens as a result of our commands, it can become very cumbersome to use. Sighted people can see instantly when a word has been misunderstood, making immediate corrections. They can also scan over options quickly and zero in on the name or number they need to call out to have something done. As Apple develops this feature further, I think it certain that it will become much more useful for most users including blind people.

Voice Control will have a very substantial and rapidly appearing major indirect benefit to blind users that I keenly look forward to. The method of labelling app elements so that they can be operated with Voice Control is precisely the same method needed for labelling these elements for VoiceOver users to have much better access to a given app. Developers who take the time to make certain that their app elements and controls are labelled properly for accessibility can help a lot more

potential users simply by doing this. Blind people using VoiceOver will benefit from these labels. So will any people who want to control apps with their voices. It improves the economic gain that is possible through taking the time to properly label apps. For this alone, I'm very thankful for Voice Control. I think it will become more useful for blind users over time as Apple works on the initial problems.

My own experience is fairly limited with this newest of accessibility features. Sharing an apartment with my wife who is also blind and constantly doing sound-based things, dictating a document, or doing other things via talking out loud isn't all that considerate when there are, frankly, better more efficient ways to get things done. Having used the touchscreen, VoiceOver and other accessories such as a physical keyboard for ten years now, I would lose efficiency and speed were I to do more with Voice Control. I can type at a rate of around 90 words per minute with very few mistakes. When I've tried dictating a paragraph using Voice Control, there were more errors I then had to carefully hunt for. many of these errors were only apparent if you examined word by word or character by character, discovering that the wrong homonym was used. The word "too" as in "also" rather than the word "two" as in the number. And then, there were occasions where my words were misinterpreted as

entirely different words that could be mistaken for others without a good understanding of context. For instance, "calm and" as opposed to "command". Computers don't actually understand the words they encounter. That requires more contextual knowledge than they currently have.

I've had more success with Voice Control when it comes to issuing commands. For instance, I can be working in a document and say "play music", "go home" to get to the home screens, "Open" a particular app, etc. It even recognizes a bunch of VoiceOver commands. Enough to let you "VoiceOver double tap" and "VoiceOver next rotor", and so on. I find it a painfully slow approach when compared to doing things with the touchscreen and VoiceOver gestures.

Another thing to keep in mind is that only a small subset of VoiceOver commands has been built in so far. When I opened a book in the Kindle app and tried to read a book, the road became rocky and slow. I discovered that I couldn't turn to the next or previous page, since the three-finger swipe hadn't been built in. I worked out that this is what's known as "scrolling" left and right. So far, so good. Even better, saying "Scroll left" and "scroll right" worked in many other contexts such as flipping through different home screens of apps. However, try as

I might, I couldn't get the "scroll" command to work in a Kindle book.

That left either reading the book completely in sequence or using "VoiceOver swipe left", "VoiceOver swipe right", and "VoiceOver double tap" to slowly and painfully navigate the Kindle book navigation menu. Not a fun approach at all but possible if disability renders it impossible to use touchscreen gestures. Personally, at that point, I'd just go for an audiobook and call it a day.

You can customize how Voice Control works. This is done in settings. To get there, go to settings, accessibility, voice control. This is the only place from where you can configure how Voice Control behaves. It is actually possible to add new commands. Perfect, I thought, gleefully. I could just add the VoiceOver gestures that were missing. Unfortunately, that isn't easy. Finding the area where you draw the gestures you want to use is easy. What proves next to impossible is finding and double tapping the Save button without either touching inside the gesture drawing area, thereby wrecking your gesture, or touching within the zone below the status bar and having the first beep happen that tells you that moving down will get you to the Control Center or Notification Center. Again, it's technically possible with a great deal of precision, fiddling to

create the needed commands. However, it just doesn't seem worth the trouble at present.

News and Knowledge in Your Hands: News Apps and Reference Tools

Even before you venture out onto the app store, your iOS device is a gateway to a truly tremendous amount of knowledge available online. The Safari web browser lets you access any website you may want to. We'll be taking a tour of its capabilities in another section dedicated to browsing the web. There is also your digital assistant Siri that, like the Safari web browser, has its own dedicated section later in the guide. Its most popular use is to answer peoples' questions, but it can also obey some commands. As revealed in the section about settings, Apple makes UK and US concise dictionaries and thesauruses freely available to be used anywhere that words are encountered in iOS. And then, there is the Apple News app. This gives you free access to a large collection of curated current news articles covering a vast array of topics. For a fee, it will also give you access to over three hundred popular magazines.

Once you've mastered the app store, you will find many apps from news organizations freely available and most often completely accessible using VoiceOver. Also, there are reference apps specially designed for iOS devices. Many of these are fully accessible and easy to use. They include everything from encyclopedias, to top quality dictionaries and thesauruses, and

to country information references like the World Factbook app. Even more specialized reference apps such as those used to identify birds, plants, and medical conditions are available. There are handy medical reference apps such as the Be Ready app from the Red Cross that contains instructions to cope with emergency situations.

As with many sections in this guide, it would be utterly impossible to go through even all of the apps known to be useable with VoiceOver and explain their workings. Instead, I will cover a few apps that can serve as examples of what is available. With the exception of the Apple News app, which is already present on your iOS device, these can all be acquired from the app store often at no cost. You'll end up with a good starting set of reference tools. After that, we'll go on an app store expedition where I'll point you to some other news and reference apps that have impressed me. Please don't ever stop looking for better alternative apps for your specific needs. They may well have escaped my notice or be beyond the scope of my interests. Also, more apps are always being developed. Keep an ear on developments at AppleVis and watch for new apps that gain popularity in the app store. For now, let's begin with the dictionary and thesaurus options Apple makes freely available to all users of iOS devices.

Meaning and Vocabulary on Tap

In the general section of Settings, you'll find a button called Dictionary. There, you can choose which dictionaries are used when looking up words. You can select or deselect resources by double tapping their titles. Being Canadian, my spelling tends to fall somewhere between American and British but leans heavily towards British. As a result, I have all four English resources selected plus the Apple dictionary. There aren't any real instructions about these tools in the user guides written by Apple. The basic idea is that anywhere you read or write text, you simply need to highlight the word you want to know about and then use the "look up" option that appears in a popup menu. A short definition is then shown that a sighted person may simply tap to reach a more extensive set of information drawn from all available resources including online ones like Wikipedia. This will pull you out of the app you were in, but once you're finished reading the information, you simply use the Done button found at the top left, and you are placed back in the app. Apple makes Oxford British and American dictionaries and thesauruses available offline at no cost to the user. They simply reside on your iOS device and are there even when you have no Internet connection.

For blind users, using these resources is just a bit more laborious. If you're writing, type the word in and then turn the rotor to the Edit setting. Flick down to Select and double tap this. Now the word is highlighted or "selected" as VoiceOver terms it. A popup menu will appear, and if you learn precisely where on the screen this occurs, you can double tap the "look up" option. However, this isn't necessary. The rotor is still set at Edit, so just flick down until you reach the "look up" option and double tap this. A temporary window pops open complete with all available information about the word you selected. If you want to look a word up while reading, simply turn the rotor to Words and find the word you want to know about. Next, turn the rotor to Text Selection and set the selection amount to "word". Flick right to select the word and then turn the rotor to Edit and flick down to "look up". Double tap this and we're in that temporary window.

This window shows the concise results from each resource. It is divided into headings for Dictionary and Siri Knowledge. More headings appear when the requisite information is available. for instance, there may be results found in the app store or Twitter. Presuming you're connected to the Internet via cellular data or WiFi, Siri looks in many places on the web for information. If the concise results are enough, just double tap

the Done button at the top left when you want to return to the app you were in. However, if you need more from a resource, each result in the concise window is actually a button. Double tapping on it will take you to the full entry, which may include further clarification or more alternative synonyms, etc. To get back to the root page, use the Back button in the top left corner. When you're done looking at information and want to go back to the app you were in, use the Done button near the top left. the Done button is always available even while inside full entries. There's no need to return to the root window before closing it.

The Apple News App

Keeping up with current events is an activity very well suited to an iOS device. Their screens easily display articles, pictures, and videos, allowing people to navigate and interact with the presented content. Apple designed their News app to provide an easy way for people in their ecosystem to access articles and reports from trustworthy providers. The content on offer is curated by an editorial team at Apple as well as by artificial intelligence. In theory, this presents you, their customer, with reliable news tailored to your specific interests. Your privacy is a major concern for Apple, so all information about what you read and about your interests remains

on your own device. The free service is very extensive and gives you access to a stupendous number of curated articles culled from the Internet and various popular publications deemed trustworthy by Apple. This service isn't supported by advertising, so the experience is a lot less cluttered up than it often can be on websites. Also, what you read doesn't follow you in the form of targeted advertising elsewhere on the Internet. The idea is that Apple can make use of artificial intelligence to help deliver reliable news tuned to your interests without ever having to keep data on what you like to read. All data pertaining to your specific choices and interests is kept on your iOS device. The artificial intelligence used to fine-tune the articles presented to you to match your interests is in your device rather than on a Cloud server. Apple has gone to great lengths to protect your privacy, and the service isn't supported by ads. Publishers receive revenue based on the length of time spent reading their articles, plus income from revenue generated by Apple subscribers.

You might wonder how Apple could possibly make a profit running a service like this. The answer is that they offer a service called News+ (News Plus). In addition to the free articles, people can subscribe to News+ and get access to over three hundred magazines. the exact number will depend on where

you live. More will doubtless be added as time goes on. The cost per month is \$9.99 US, which is around \$13 Canadian at the time of this writing in March of 2019.

Designed by Apple, the app supports all of the accessibility tools built into iOS. This makes articles, videos, and magazines very accessible to users of VoiceOver. Beginners can get around by flicking left and right and double tapping on options. In fact, this app is a splendid place for beginners to practice using VoiceOver's various reading controls. It will encourage you to master the VoiceOver rotor, which lets you move much more efficiently to headings, images, and links. Articles are a breeze to read. They can be read continuously or moved through line by line with VoiceOver's standard reading gestures. Once you have explored the screen and developed a sense of where things are, this app makes a tremendous amount of content very accessible. Video content plays easily with the controls fully accessible to VoiceOver.

Magazines are a bit more hit and miss when it comes to being accessible using VoiceOver. As a general rule, it's very rare that you won't be able to read the text, although this is the case with a few very visual magazines. The level of accessibility is heavily dependent on choices publishers make. I found a few that were nearly useless. However, most magazines

are done in a way that makes their article text very accessible. Most publications also make use of headings, sections, and captions, making them a pleasure to navigate and read once you've mastered the VoiceOver rotor.

Screen Layout

This app has different layouts for the iPhone and iPad. However, any content may be viewed on either device. For iPhone users, there are three tabs at the bottom of the screen. These are the Today tab at the far left, the News+ tab in the middle, and the Following tab on the bottom right.

The Today Tab

In this very busy tab, you'll find a series of sections divided by headings. The Top Stories section comes first. There are also headings for any general categories you've expressed an interest in like health, technology, business, etc. Also, there are sections more tailored to your interests, drawing on content from the Following and News+ materials. The Today tab puts all of the most current content right in front of you.

The News+ Tab

This tab contains complete issues of the magazines made available to people who subscribe to the service. These can be read online or downloaded for offline reading. Near the top of the tab, you'll find buttons to browse the catalogue

alphabetically with a button for magazines with names from A to M and another button for N through Z. Past these buttons, you'll find a list of categories including business, entertainment, health, etc., so you can browse the collection by category. There are also headings below these categories with any new issues and other items that might be of special interest.

The Following Tab

This tab is where you can follow topics of interest as well as block content sources you don't want included in material presented to you in the app. This tab is where you can customize your experience and help the artificial intelligence on your device learn what interests you. Near the top, you'll find a search field as well as an Edit button, letting you find particular interests and rearrange content. You then come to a series of topics you've decided to follow. Flicking up or down lets you block, ignore, remove, and do other things to these. Further down, there are headings for Suggested by Siri and a heading called Personalize Your News. This heading is important, as you'll find buttons to discover new topics of interest, block and manage topics, and also a button letting you manage the notifications that the News app generates by topic. Decisions you make here will determine what is presented to you in the other tabs of the app.

Let's talk about that Following tab. What's different about navigating around it?

This is a very busy tab. Think of it as your own personal newspaper with sources and articles that are the most tailored to your interests. It's still divided into headings, and there's a search field at the top for finding specific topics of interest. Below that, there's a Following Channels & Topics heading. This is where all of the topics and channels you have chosen to follow are listed. Flick left and right to go through them. You can flick up or down to act on them such as to unfollow them. Double tap on one of these to enter that particular topic or channel. You can then flick right through a list of content. There's always the Back button at the top left to go back up a level as you drill down into topics and channels. The next heading down is Suggested by Siri. This heading lets you look through topics and channels that Siri believes you might be interested in based on what it knows about your interests. Below that collection, there's a final heading called Personalize Your News. This lets you discover new channels, block, and unfollow channels, and really manage what the News app works with when choosing news stories to prioritize and display to you.

iPad Layout

There are no tabs to keep things compartmented when using this app on an iPad. Instead, there's a sidebar that you can always find the button to show or hide in the top left corner. When the sidebar is showing, there are buttons running down the left side of the screen, giving access to the Today, News+, and Following sections as well as to other areas. I find things easier with my iPad in portrait mode rather than landscape, which I normally prefer. I personally struggle with my iPad but think that people who are more used to working with the larger screens will have considerably less trouble. Everything is laid out in the same sort of sensible way with headings and buttons. I didn't realize at first that the News+ button used the punctuation mark for "plus" rather than the word. Since my iPad was set to no punctuation, I was initially completely thrown off and didn't clue into how the sidebar worked. You just have to double tap the toggle button to make it appear and then feel around the left side of the screen for what you want. then, double tap the content source or area of interest.

When the sidebar is hidden, the whole screen is then filled up with only the content source you've selected. For instance, if you select the Wired news feed or a magazine issue, that's the only thing that will be on the screen once the sidebar is

hidden. Simply double tap the sidebar toggle button when you need it again to navigate elsewhere. Having this option gets rid of a lot of clutter and makes it much easier to focus on a specific article or content source.

Reading Content

Now that you have an idea of what the different tabs and areas in the News app are for, we'll focus more keenly on the experience of reading articles and magazine content. Once you've double tapped on an article, the article becomes the main content of the screen. You'll find its title as a heading, as well as buttons to adjust the text size and share the article. There's always a Back button in the top left corner to leave the article and go back to the Today tab. Different publishers of these articles do things a little differently. Don't expect things to be consistent in terms of article structure. Some will be more divided by headings than others. You may find more or less divisions by heading within different articles. In some cases, it might be better to move between images. Turn the VoiceOver rotor to whichever option works best.

Any content I might choose to serve as an example will be long gone by the time this guide gets into your hands. Let's take an article from CBC News about the carbon tax going into effect. Near the title, you'll find the word "Politics"

indicating the section the article was taken from. Next, you'll find the article title as a heading. There are then a number of headings you can quickly use the rotor to flick up or down between. Alternatively, You could flick downward with two fingers to continuously read the article. Occasionally, this doesn't entirely work, and you'll find that VoiceOver jumps back to the beginning. Normally, though, the whole thing is available so there will be no need to scroll to the next page. That happens automatically as VoiceOver reads. Great for when you're having a coffee and just want to take it all in.

There are times when a more active closer reading of an article is what's needed. That works very well. You can use the rotor to flick up or down to specific headings within the article to get at what you are interested in. Once there, you can flick left or right to read line by line. You can use the rotor to go by character or word so you can, for instance, find out how someone's name is spelled. Also, the text selection part of the rotor lets you select one or more words, lines, etc. This lets you then set the rotor to Edit and copy parts of an article. Also, you can select a word and look it up using the Edit rotor setting. This taps into the dictionary and thesaurus you've selected in iOS settings and also grabs definitions from the web if you're online. I've found that when I select a word,

the "look up" option pops up and I can just double tap my iPhone to look up the word without going to the Edit rotor. There's a Done button near the top left for when you're finished reading about a word. Below the article, there will be additional headings for related stories and more news.

Not all pictures are described. Mainly, there are captions that are easily read by VoiceOver. However, it's up to publishers to caption images. I haven't found evidence of any alt text that would only be read by VoiceOver but be invisible to sighted readers. However, I suspect that Apple has made that kind of thing possible. The rotor lets you navigate between images and links while in articles.

When you're done reading an article, there are other options besides using the Back button at the top left. You can also follow links to other articles in the headings underneath. At the very bottom right corner of the screen, there's a Next button, which takes you to the next article found in the Today tab or in a particular feed if you're reading articles in the Following tab. This makes it easier to jump to articles related to the main story you're reading. You never need worry about getting trapped. There's always a way back to the main screen of any tab.

Topics and Channels

Basically, topics could be any keywords you think up, or they could be areas of interest. Technology or sports could be a topic. So could accessibility or blindness. When you choose to "follow" a topic, the News app will continue to check for articles matching it whenever you open the app or actively refresh the content of an area you're in with a three-finger swipe downward. Once you double tap on a topic, you can flick right through a list of articles found about it. These are listed in order chronologically.

Meanwhile, Channels are like big limbs on a tree. They are sources like Wired, Polygon, BBC News, or CBC News that might have many different sections. You'll know you're in a channel when you flick right and find a row of different topics right after each other. Being Canadian, I've chosen the CBC News channel for our closer examination. They have a fantastic news app that I prefer for viewing their particular content, but their articles are made available in the News app, which can be very convenient. The CBC News channel has eleven sections starting with Top Stories and ending with CBC Investigates. Flicking right past the last section lands you on the first article in the selected topic. It will start with the first section selected. For CBC News, it is Top Stories.

Double tap on a section title to select it. To the right of the section list, the feed will change to that section's available articles. As usual, you can double tap on an article of interest to go into it. Use the Back button at the top left corner to exit an article, returning to the channel or to exit a channel entirely.

Audio and Video Content

You're quite likely to encounter links to videos in the lists of what the News app comes up with. While reading through articles, you'll frequently come across Play buttons. These will lead to video or audio content that the News app is quite capable of allowing you to watch or listen to. Double tapping such a Play button will cause the content to start being played. While this happens, controls will be available on the screen that let you pause and resume playback and navigate through the content.

Unlike many other situations particularly when video is displayed in iOS, the playback controls aren't hidden away. This is very useful with news reports when you want to hear something over again, for example. You may also notice that the VoiceOver rotor has the description and subtitles option present while in the News app so that you can choose whether you want to hear

subtitles read out or, if you have a Braille display, have subtitles sent there.

The News+ Proposition: The Accessibility of Magazines for Blind Subscribers

In some quarters, print magazine issues may seem pretty outdated. Many of these publications are struggling to keep afloat. True to fashion, Apple has managed to convince many such magazines to offer their content to News+ subscribers. For the price of around \$10 US per month, subscribers are given access to full issues of hundreds of magazines. In exchange, Apple pays out revenue from this subscription income. Magazines are also paid based on how long people spend reading particular content included in what is offered to non-subscribers who use what the News app offers freely. This greatly increases the potential audience for individual articles that may very well be of interest to people who would otherwise never purchase the issue of the magazine the article was published in.

For blind people, this has suddenly made a very wide range of magazines a lot more accessible than they've ever been before outside of libraries and services that produce special accessible versions of magazine issues. Thanks to VoiceOver and Apple's accessibility design principles used in the News app, people are able to read articles in synthetic speech or Braille

very closely. This allows them to learn how names and unfamiliar words are spelled, look up unfamiliar words, and get more of a sense of how things are laid out. They can also share items of interest with friends and family, especially if they also have a News+ subscription. There is a pretty wide ranging spread of magazines, and this number is likely to grow over time.

Available categories range from hobbies, to business, to news and lifestyle.

These magazine issues can be downloaded and read while you're offline. Flicking down while on an issue title gives you the option to download the issue rather than opening it. Just double tap once it says download, and the process happens. I think the issues are removed automatically after a while. There doesn't seem to be a place to manually manage downloaded content other than in the Saved Stories section found in the Following tab.

Exploring the range of magazines available is simple. There are categories listed at the top of the News+ tab. They start with two that allow you to browse the catalog, dividing it alphabetically in half from A to M and N through Z. Past those two options, you'll find a bunch of categories such as health, hobbies, business, news and ideas, lifestyle, and many more. Double tapping these shows available magazines that fit into

that category. Once you've gone into a category, you'll find a Back button at the top left that will return you to the main News+ screen.

You are able to keep track of what magazines you've started reading quite easily. There's no need or method of "subscribing" to them individually. Below the categories is a heading called My Magazines. It is where you'll find a list of any magazines you've shown a recent interest in. There are Reading Now and Recent headings, and at the very end of the headings, a See All button. These let you choose your focus. Past this See All button, you'll find a heading called New Issue if fresh issues of magazines you're interested in are available. Past this, there is a heading called Featured Issue where Apple's curators will pick a magazine to call people's attention to. Finally, below this content, there is a heading to whichever newspaper your geographical location entitles you to a free subscription to. In my case, this happens to be the Toronto Star.

Publishers have pretty wide latitude when it comes to how their issues are formatted. Some magazines are better suited for accessible reading than others. During my explorations to see about how consistent things were, I looked at a retro gaming magazine that was pretty much impossible to read due to being so visual. Images didn't have captions, and the table of contents

simply consisted of a list of page numbers. I could scroll through pages with three-finger swipes to the left and right and read bits of text, but it was rough going for very little return. On the other hand, magazines like National Geographic, The Atlantic, and The Walrus were a joy to read. There were headings, links, and captioned images. The titles of articles were in the table of contents, so you knew where you were going when you double tapped.

The table of contents should appear first upon double tapping a magazine title while on the News+ main screen or within a category. I think that, sometimes, a magazine cover may appear first. If that happens, look near the bottom right corner for an Open or Next button. The Open button will always get you to the table of contents while inside a magazine. The Next Page button gets you to the next page of a magazine. You can also scroll between pages with a three-finger left or right swipe. Left is forward a page. Turn the rotor to Characters, Words, Lines, Headings, or Images to then be able to flick up or down between these things. If there are links on a page, you'll find a Links option in the rotor. If you're running VoiceOver with Hints enabled, you'll actually get hints telling you this as you move onto different elements.

On a really positive note, the entire text of an article is able to be read through as a single body without having to click a More or Next button. You can just read through the whole thing without any pause if you wish. Using the rotor as described above, closer scrutiny is possible, allowing you to find out how names are spelled and to look up unfamiliar words. The app works well with Braille displays, giving Braille readers access to a tremendous amount of reading material with very little effort involved.

When it comes to images, things aren't quite so rosy. If there are captions, these can be read by VoiceOver provided they're in text form. You'll often find these in the middle of articles. However, in one magazine I thoroughly enjoy called the Walrus, there are full-page images in-between articles. In such circumstances, the only thing you'll find using VoiceOver other than the usual buttons is the word "image". In such circumstances, you simply have to move onto the next page with text via the three-finger swipe or the Next button found at the bottom right of the screen.

Presuming you like the whole idea of more in-depth articles written by people keenly interested in the subject matter, I believe blind people will find the News+ subscription worth paying for. Overall, I've found articles to be easy to read and

very accessible. While it's true that we miss out on images, especially when they don't have captions, having ready access to these magazines adds real substance to one's exploration of topics. Provided that you're able to find four or five magazines you keenly enjoy, you're getting more than your money's worth. Subscribing to that many magazines individually would cost far more than what Apple charges for the News+ subscription. The free trial lasts for a month, so if you don't want to pay the subscription fee after trying it, go to the Following tab and down to the Personalize Your News heading. Flick right until you find Manage Subscriptions and double tap this. You'll then be in the area where you can cancel your trial.

App Store Expedition: Other News Sources and Reference Tools

If you have a favourite news source, the chances are good that they have an app in the app store. These are designed to present their content in the best possible manner on your iOS device. Many of these apps are designed with accessibility in mind and work well with VoiceOver. This is particularly true with apps produced by larger organizations. Both Microsoft and Google have apps that are quite similar to the News app from Apple discussed above. The CBC and BBC also have dedicated news apps. These apps organize content into categories and allow users to easily find and consume content. These apps are free of

charge so you lose nothing by obtaining them and trying them out.

When magazines and other smaller publications produce apps, they are less likely to consider accessibility. Also, accessing content in such apps often requires you to pay a subscription fee. I have yet to find an app dedicated to a single magazine that has proven to be accessible. Proceed at your own risk.

The Wikipedia Mobile App: Your Accessible Portal to the Encyclopedia Everyone Built

If you've ever wanted an encyclopedia that was free to use and completely accessible for blind people, you'll want to grab the Wikipedia Mobile app. Wikipedia is an encyclopedia that is made *by* anyone interested *for* anyone interested. Thousands of experts and ordinary people who have a deep interest in particular topics write and edit articles. A non-profit foundation called Wikimedia keeps everything going. People can create and edit articles about topics of interest to them. Currently, the English version of Wikipedia has over five and a half million articles about everything under the sun. A core group of volunteer administrators and editors work to deal with disagreements, remove biased information, and maintain overall article quality. Initially, there was a lot of pushback from academia. It wasn't seen as very credible, since anybody could

edit it. However, over time, it has continued to gain traction in the general population as a reliable, free, and useful source of information. The apps of other commercially driven encyclopedias have stagnated or simply vanished from the app store. People simply haven't been willing to pay for the certified expertise of more traditional encyclopedias. Things have reached the point where teachers regard it as a good tool to at least start a research project with.

App Layout

There are five tabs starting with Explore on the far left, the Places tab to the right, the Saved tab, the History tab, and at the far right, the Search tab. The screens are easy to flick left and right through. Once you're inside an article, the rotor can help you quickly navigate through headings or to any links. At the top left of all screens, you'll find any appropriate controls for navigating, searching, entering settings, etc. If you're inside an article and want to go back, there will be a Back button at the top left of the screen.

The Explore Tab

This is where you'll spend most of your time. At the top left is a Settings button giving access to display and other settings. Next to that is a search field where you can type in what you want to look up. After doing this and double tapping

the Search button, you'll find a list of results based on your search. Double tap one of these to go into that article.

Next to that search field, past a title that says Today, there are currently featured articles. Double tap on the title if you're interested in reading the article, and you'll be taken off the main screen into that featured article. Double tap the Back button when finished. Flicking right on the main screen will take you further along to older featured articles. You may also find described images.

The Places Tab

This tab uses your current location and lists places near where you are that it has articles about. This can serve as a handy travel guidebook, and GPS apps like Navigon let you incorporate information from Wikipedia for this reason. Places can be listed with their distance and direction via clock method next to the place name. There doesn't seem to be any way to sort the order that they appear in the list. Alternatively, they can be shown on a map using the Maps app included in iOS.

The Saved Tab

This tab is where you'll find any articles you've chosen to save for later reading. They're available to you even while offline. There's not much to this tab. Just a list of articles you saved. When you're inside a saved article, you'll find a

button at the bottom to "unsave" the article, removing it from this tab. Handy for situations where you know you'll be offline for a time and need certain articles ready for use.

The History Tab

This tab shows a history of all your activity on Wikipedia. You will also find a Clear button near the top left of the screen to wipe this data if you're concerned about privacy. Days are presented as headings, so you can use the rotor to quickly scroll through days of activity. Double tap on an article to get back to it quickly.

The Search Tab

This final tab is taken up by a search field where you can conduct systematic searches without any clutter around. Below the search field, you will find a list of all your recent searches that can extend for pages if you use a three-finger upward swipe to scroll down the list.

Reading Articles

Once opened, an article takes up the main screen. You'll find the rotor useful to flick between various headings, learn how words are spelled, select and copy text from within the article, etc. Knowing your VoiceOver rotor is very desirable to maximize the usefulness of this app. You can certainly read articles casually without the rotor, but it makes navigation and

more careful reading very easy. After a heading, flick right and you'll find an Edit button. Double tap this if you want to make changes to an article. You don't need an account to edit an article. However, your IP address will be kept track of, so there is still accountability. You will also find controls at the bottom of the screen where the row of tabs would normally be. These controls let you view the article in the Safari browser, search within the article, change the display theme, change languages, go to the table of contents for the article, or share the article.

There are flags and notes in articles that indicate things like whether further edits are needed, whether there's disagreement, etc. Be certain to look for these and also look at the references listed after the article. Each article is written by different people with possibly very different motivations for contributing to Wikipedia's information. Be mindful of that. Things aren't as polished as you'd find in a commercial encyclopedia like Britannica. On the other hand, there's a staggeringly large amount of knowledge in Wikipedia. People need to care enough to bother contributing and/or messing up articles. There's effort involved. Before dismissing it as useless or trusting it completely, think about that.

Dictionaries and Thesauruses

There are many dictionary and thesaurus apps available for your iOS device in the app store. It may also be possible to purchase these references as ebooks. The main problem with this latter option for VoiceOver users is that the whole book is searched rather than just the names of entries. You would therefore often come to an instance of a particular topic or term that would be outside of its actual entry. For example, the word "road" would appear in lots of places in a dictionary besides where the definition of a road would be found. Apps have search fields that only look at the index of entries so that it is practical to find the information you actually need quickly.

Unfortunately, these reference apps are not all accessible for blind people. I would urge you to use some caution before spending any money for an app. Before I do, I usually look on the AppleVis site to see if members of that community have had any experience with the app. Besides accessibility concerns, it's also a good idea to find out where these apps are getting their definitions and information from. A number of them tap into online sources like the WordNet database from Princeton University. There are other online repositories of words, and information about them, so people should look in the app

descriptions or google an app online to see if that aspect of an app meets their needs.

Wikipanion

The Wikipanion app has replaced the Wikipedia app on my home screen now. Wish I found it ages ago. It lets you access all kinds of different wikis and switch quickly between them as needed. It comes with Wikipedia already added by default, and I've added Wiktionary, Wikivoyage, Wikiquote, Wikihow, and Wikispecies. This essentially gives me an encyclopedia, dictionary, thesaurus, how-to guide, quote reference, atlas, and species information that is fully accessible and free. Results are all organized by headings, so it's easy to do everything with VoiceOver using the rotor to flick through headings. There's also a Contents button near the bottom of entries, letting people who aren't comfortable with the rotor get around to different sections of articles. It doesn't get much easier than that.

The catch is that anybody can edit the information, so you need to be alert for indicators of bias, disputed claims, etc. Also, not all entries are of equal quality and thoroughness. You're getting voluntary contributions from thousands of people with different interests, available time, motivation, etc. Not all entries are rigorously checked by experts willing to stand

behind their work. Provided you keep that in mind, it's an excellent resource for casual everyday use. Remember that you need Internet connectivity to retrieve information from these wikis. For a crowded home screen page, this one-stop shop of a reference app can make for an excellent helpful addition.

Other Accessible Dictionary and Thesaurus Apps

Sometimes, you might need more credible definitions that aren't subject to everyone's edits. This may be especially important for students and writers. There are some nice choices.

WordBook App

The WordBook app is very accessible and has a good set of features. It combines a dictionary and thesaurus into the same app, and you don't need to be online to use it. If you like, you can add online references to the app to extend its reach even further. It's made by Tran Creative Software and is around \$4 in the app store.

Terminology App

Another excellent all-in-one app is Terminology by Agile Tortoise. It uses the WordNet database from Princeton University, and you don't need to be online to get definitions. You can add online references to the app, and information is nicely organized into headings for easy navigation. The developer is very aware of blind users and has made extensive

efforts to make certain the app is accessible. Not as expansive as other apps but very dependable and easy to use.

Chambers Dictionary and Thesaurus Apps and the WordWeb App

For around \$30, there is a very useful and robust combination of apps that work seamlessly together. You can buy the Chambers Dictionary and Thesaurus apps. These offer stable and accurate definitions that are often also funny. These two apps plus the free WordWeb app give you a lot of word power, which is less cluttered with extraneous features than other options. WordWeb is a very good and accessible dictionary thesaurus in its own right, but it's nice to have the Chambers apps for deeper digging. The apps all use an identical interface and have an xref button that lets you easily jump between them as needed. This eliminates any confusion, which sometimes happens when the dictionary and thesaurus are in the same app. The WordWeb app is great for on your home screen, since it's more than good enough for most situations. When needed, you can quickly get to the heavy artillery and know that it works precisely the same as WordWeb. It's a great combination that doesn't take up a ton of space and is always available even when offline.

Finding the Right Words with Garner's Modern English Usage

Developed by Law Prose Inc., this app is available in the app store for \$40 Canadian.

For writers, students, and people wanting a deeper understanding of how terms and expressions are used in modern English, this app is a wonderfully accessible, English language reference app. This reference can be obtained as a large ebook or physical book. However, it would be extremely impractical for blind people. Having the reference be an app is particularly helpful to blind users in this case.

Brian Garner is one of the world's foremost writers on English grammar and usage. He has written over 20 books including Black's Law Dictionary.

There are over 8,000 entries on various words, as well as a large number of essays about all sorts of topics of English usage. These essays include ones on clichés, nouns, adjectives, capitalization and much more. You'll also find a glossary and language change index that helps you understand how well-accepted terms are. All of this can be easily browsed and searched.

This guide covers UK and US English. It should, therefore, prove a useful resource no matter where you may be in the English-speaking world. It's just over 2 megabytes, so it won't

take up a lot of room on even an iOS device with the smallest available storage. The app will be called GMEU on your home screen.

The word entries differ from what you'd find in a dictionary. The entries explain how a word or its usage has changed over time. For instance, the entry on "deadly" included a short definition. However, its main focus is on how this word has replaced "deathly" in phrases such as "deadly dull". In earlier times, you would have said "deathly dull". The entry on "dice" explains how "die" and "dice" are often mistakenly used interchangeably in modern English.

Rather than just telling us how words are used, Mr. Garner tells us how they ought to be used. He often sites humorous examples to make his points. However, make no mistake. He has a sense of how things ought to be done correctly. Many of his critics feel he is too unaccepting of change in his quest for clarity.

The button at the top left called Hamburger is the "menu" button. It brings up a menu that you can then flick right and left through options. Double tap on the one you want to reach the content you're after. For instance, double tap on the Essay Entries option to get to a list containing all of the essays in

the book. These would otherwise be very hard to find, as they're not really separated from other entries in the book.

The Search option lets you search the whole book for words of interest and looks at entry titles rather than the complete text. That's absolutely crucial to making this a useful tool. Otherwise, you'd search for a word and keep running into other occasions in the book where it was used in other entries.

Other tools to be found in this app include a quick editorial guide, which is a numbered list of commonly made errors. There is also a section of thirty interactive quizzes, each having ten questions. They're all fully accessible. There's a pronunciation guide. You'll also find explanations of the language change index. This is a number from one to five found in entries telling you how widely accepted an entry is. This app is extremely comprehensive when it comes to providing information to help understand how modern English works.

There are some accessibility disappointments with this app. Not all buttons are labelled clearly. I've come across a number of Done buttons that don't seem different or to actually do anything. There are other minor things like that. However, I haven't found anything that prevents me from full use of this resource. The quirks are easy to live with. One thing to keep in mind is that this app hasn't been updated in over a year. This

raises the question of how serious the developer might be when it comes to maintaining the app.

Miscellaneous Accessible Reference Apps

I have a folder of over twenty reference apps and that doesn't include ones that I use often enough to want them out of that folder and on my home screen. The examples I've given above are heavily skewed towards writing and language. However, there are all sorts of other useful and very accessible reference apps. I thought I'd briefly go over some of my best finds.

First Aid

Developer: 3 Sided Cube and Canadian Red Cross

This app is a real gem. The app is free but encourages you to buy supplies and/or donate to the Canadian Red Cross. There are no limitations regarding the information available, and there's plenty of good basic emergency medical advice to be had. It's all readable using VoiceOver. There are also videos that might possibly help sighted people. Not all videos have spoken instructions. I recommend exploring this app before you're in an emergency and perhaps making use of it more as a way of knowing what to do in advance. Make certain that someone else has called professional emergency help before you go poking around in the app for advice. Otherwise, please use that iPhone to make that phone call if nobody else already has.

Factbook

Developer: Dictionary Mobile

This is a version of the CIA World Factbook made into a very handy little app. It's one of the accidentally accessible ones, so some button labelling could be better. However, the app is ultimately useable and makes the contents of this resource easily readable. Think of it as an atlas without any maps. If you need to know a bit about a country in a hurry, Factbook is a good little app to have on hand.

Time to Play: Accessible Games on iOS

Good games make for wonderful teachers. As a boy, I basically taught myself to type fast and accurately in order to find out what happened next in text adventure games playable on the Apple computer I had. Later, when it came time to take typing class, I was way ahead of everyone due to this early play. That experience has stuck with me and served me well over the years. Those same games taught me a great deal more. In text adventure games, everything is built from, described by, and controlled by words. As a result, I learned a lot about places and objects in the real world.

Games aren't just wastes of time. Play isn't a waste of time. It helps us form deeper connections in the brain and is crucial to our ongoing mental health and development. Games can help us to better understand our world, technology, and each other. Whenever I've gotten some new and different accessible technology, one of the first things I do is look for opportunities for play. I might grudgingly spend an hour trying to figure out how to use the screen review capabilities of my screen reader. This sort of effort is necessary at times to grasp the basics. On the other hand, I'll cheerfully spend a whole weekend trying to win an adventure or master a game I can play with other people. When Monday rolls around and it's work

time, last weekend's fun has given me skills that make the work I need to do much easier. In an environment so different to what is traditionally encountered by blind people hoping to benefit from technology, I would go as far to say that to become truly comfortable using a touchscreen, finding ways to play and have fun is absolutely essential. I hope this section of the guide will point you to something you can really enjoy. We learn best when we're busy having so much fun that we don't realize it's happening at all.

I've always encouraged beginners to obtain and play games with their new technology. It helps get past feelings of intimidation and gives them a compelling reason to use their devices. In far too many cases, people have a grudge against technology simply because they don't find ways to enjoy what they have. While technology is often portrayed as a means to fun for sighted people, it is largely touted as a means of accomplishing things independently for blind people. The sad disadvantage of this is a kind of grudge against the very things that can make meaningful change in our lives. People who are hoping to vanquish their friend in a game or solve a murder mystery have a vested interest above and beyond mastering something that seems new, difficult, and disconnected from their everyday concerns. Good games feel neither daunting nor dull.

They pull you past their interface and mechanics right into their captivating headspace. While you're playing, figuring out how to operate your device or review the screen transforms from a dreaded chore into the means to an exciting and desirable end.

There are a great many accessible games for iOS devices. An exciting aspect of the iOS platform is that Apple's included accessibility tools make it easier for developers to design mainstream apps and games in a more inclusive way. This lets blind people play at least a small fraction of some of the same games their sighted friends and family are also able to enjoy. On admittedly rare occasions, you'll potentially find that a game you like is ranked highly in the top charts of the app store. To find a prior occasion where a game enjoyed by blind people was popularly played in mainstream society, you'd need to go back before arcade games to the days of Colossal Cave, Zork, and other commercial interactive fiction from companies like Infocom. Presuming you can find copies of the data files, I'll be discussing an app that lets you enjoy a great many classic adventure games later in this section. Most of the time prior to the advent of iOS, it usually took until after a game stopped being popular for people to figure out how to make it accessible. Different economics and fundraising tools like Kickstarter are presenting blind people who have iOS devices

with new gaming opportunities and unique experiences. It is now possible for us to leverage our dollars to make developing accessible entertainment more attractive and/or possible. It is also more economical on iOS for people to use the accessibility features built into the iOS operating system to make apps accessible right from the start rather than years after they're released to the general public.

In this section, we'll take a tour of some of the different types of games that are fully accessible and safe to acquire. We'll also look at other possibilities for playing with others that apps and capabilities on your iOS device make possible. Rather than going into great detail about how to use all apps discussed here, I'll pick out some apps that illustrate conventions and techniques found in other apps that will be more briefly discussed. You may not enjoy all of the games I cover. Hopefully, you'll find at least a few games that appeal to you. Also, keep in mind that there are likely more accessible games that have gone undetected by the blind community. More than one developer was surprised to hear from blind people who were able to at least partially play their games. Quite often, such surprises have led to full accessibility. While there may not be a game in a genre you prefer, you can at least be certain that the apps described here have been made with blind players in

mind. While the number of games is growing pretty rapidly when compared to prior accessible platforms, not all genres have been made accessible. I hope you find something that suits your interests, allowing you to partake of the benefits that games can bestow on people who hope to be more comfortable and proficient users of iOS devices.

Dice World

Starting off with something that can be social, friendly, and very easy to start playing seems like the best plan to me. Looking through the hundred plus games on my iPhone, the game that tics all of these boxes best is Dice World. Designed for sighted casual players, the developers have done a great deal to make their app wonderfully accessible to blind players. They have reached out to the blind community and are eager for any suggestions and feedback. They are also committed to making certain that future games they create are accessible to blind people. Using the Dice World app, blind players can compete on a totally equal footing with sighted friends and family. They can also socialize using messaging facilities included in the app that are accessible using VoiceOver. Little wonder then that even years after its release, Dice World remains extremely popular.

The Dice World app currently contains six games of chance. These include: Farkle, Yatzy, Balut, Pig, Threes, and 1-4-24. The rules for these games are comparatively simple but decisions can get tricky. This is especially true for Balut which is akin to Yatzy but played with more spots per category of roll. These games can be played against artificial or real players. You can play with friends or make new ones among the community of thousands of players around the globe. Facilities for chatting with your human opponents are also included. It's a great app for beginners. The games are simple to play and not too time-sensitive. There is plenty of help and tutorials for beginners or people who are unfamiliar with the various dice games. Let's explore this app in detail.

The first time you open the app after obtaining it free from the app store, you'll be taken to a dialogue that asks whether to start as a new player or log in with an already existing account. This latter option lets you have the same account on more than one device if you like. Starting out as a new player will create an account for you. You can then go into the settings found inside the app and change your account email and password. I recommend you do this so you can better remember the information should you want to log in from another device or need to reinstall the app.

Once you've completed the login process and your account has been created, you will be ready to play and will find yourself in the app's main screen.

At the top of the main screen, you'll find the dashboard. This consists of a bunch of your current statistics. You'll see the number of games you've won, lost, and remain active in. You'll also see which level you've reached and the amount of progress you've made towards the next level. You make progress by winning games and tournaments that earn you bonus rolls and experience points or XP. Higher levels require more XP to complete. Reaching a new level will reward players in bonus rolls and other perks such as unlocking fancy dice they can use.

Past these statistics, there's a button to get to even more statistics. These cover your game play in far greater detail and are meant for more hardcore players. Another button accesses your collection of medals you've won. These are gained by achieving certain things in the game such as beating AI opponents. When you win a medal, you will be informed. You'll also see your current number of available bonus rolls. These are used during game play to re-roll dice and perhaps obtain a better result. Past that, you'll flick to options to enter the store, join a tournament, or start a new game.

Beyond those options, you'll find headings separating games where it's your turn, your opponent's turn, and recently played games. At the very bottom, you'll find options to open the chat center, access settings, and earn free bonus rolls by watching advertisements. Flicking on any of these will result in VoiceOver Hints being read if they are enabled.

This app uses a number of conventions that apply no matter which game you might be playing. For example, while inside a game, you'll find two buttons labelled Help. Presuming you have VoiceOver Hints enabled, you'll hear that the left most Help button provides access to game rules. Meanwhile, the button at the far right will provide more context-sensitive help such as which moves are possible to make. You'll always find a sequential row of any dice used in a game. Double tap on a die with one finger to select or deselect it before initiating a roll. You will always find the button that lets you access ongoing message conversations or chats at the top left of the screen near the Back button.

To get a sense of how games in Dice World work, we'll play through a round of two games, namely Farkle and Yatzy. In doing so, you'll get a better sense of how two very different game screens work. That is, games with score cards such as Yatzy

versus games where each player has a score earned during a round of play as in Farkle. Let's begin.

A Round of Farkle

I'm in the middle of a game of Farkle with my friend Michelle. Having recently lost what low vision she had, she also faces learning challenges. The design of this app made it a good candidate for her. The chat system built into the app is simple enough to manage using common conventions familiar to her. Also, the games are easy to play and can be enjoyed even if you don't fully grasp probabilities. She first mastered the game of Pig where you need to roll a total of one hundred points before your adversary. Farkle is a bit more complex. You need to be the first to reach ten thousand points. During each round, you roll from an initial pool of six dice. This pool shrinks by one or more dice each roll, since at least one die must be locked. With each roll of the remaining dice, the danger grows that none of them will be useable. This is called a "farkle" and ends your turn during this round of play, forfeiting any points scored previously during the round. To be useful, a dice must come up either as a one, a five, or be part of a set of three or more dice showing any other number.

It's currently my turn on our sixth round of play. At the top of the screen, there's the Back button. I then see the game

title, Farkle Bonus. The "bonus" indicates that Michelle and I can each use a bonus roll during each round if we wish. Waiting after reading the title allows the VoiceOver Hints system to inform me that I will get the final roll of the game. Flicking right, I find our current score, a chat button should I wish to communicate, and my opponent's current overall level in Dice World. I then come to information regarding the last five rounds of play.

Below this information, I reach my pool of dice. Rather than flicking, I can simply touch where the dice are on the screen, getting to them much more quickly. Since I have yet to roll, they are in their default positions sequentially from one to six. Flicking past these, I come to the Actions heading. Using the rotor, I could turn it to headings and simply flick down to reach Actions. Flicking right past this heading, I find my game options. The Bonus Roll button is present, since I have yet to use my bonus roll this round. I flick right and double tap on the Roll button. I roll 2, 4, 4, 4, 3, and 6. If it weren't for those three fours, I would have farkled out and had to use my bonus roll or forfeit the round. Flicking right past the now inactive Roll button, I double tap on the Select All button. This is a shortcut to select and lock all possible dice. I now have three remaining dice free to roll again. Since I have

a good supply of thousands of bonus rolls and still have my bonus roll to use during this round, there's no reason not to do this. I get 3, 6, and 3, which results in a farkle. I find the Use Bonus Roll button and double tap this. In a massive stroke of luck, I get 1, 3, 2, 4, 5, and 6. A full set of six dice is worth fifteen hundred points. What's more, I can roll all of these dice again. You can farkle on a roll of six dice, but the risk is small. I double tap the Roll Again button, yielding two 5s, a 1, and three 6s. Luck is certainly with me. I double tap the Select All button and can once again roll all six dice. I now have 2,700 points this round. I get matching sets of 5, 1, and 2, meaning that once again, I can select all of the dice. This brings my total for the round to 3,450. I roll once again ... and my luck runs out as I sadly farkle on a six-dice roll. I would have attained a substantial lead had I not been so greedy, but as I say, the chance of a six-dice farkle is relatively small. I forfeit all 3,450 points, and the game passes to Michelle who must take her turn.

As you can appreciate, the real dilemmas come when you find yourself with say 3,500 points that you could bank but still have four dice free to roll. Farkle is full of choices like that and never seems to get old. There's enough skill involved that

good play matters but enough chance that anybody can come from behind and win. It's a great way to learn about risk management.

A Turn of Yatzy

The Yatzy screen is a full one due to the score cards of both players being present. All of the options common to all games are present. This includes a Hint button at the bottom right that gives you a list of possible moves. I currently have no games of Yatzy in progress, so I select New Game and then choose the Computer Player option. Selecting from the artificial players, I then select yatzy as my game. Since I'm playing against an artificial intelligence, I can't use my bonus rolls as I could in my game of Farkle against Michelle.

Turning the rotor to Headings, I flick down to reach the Actions heading and flick right to Roll 1. I get 4, 5, 6, 6, and 6. Not a bad first roll. Since I have VoiceOver Hints enabled, my possible moves are read out to me. It's a nice long list. I could score 27 in the 3-of-a-Kind and Chance categories. Alternatively, I could settle for 18 in the Sixes category. Choosing to go for more 6s, I flick past the Roll button to the Select All button. Flicking down, I set it to "Sixes" and double tap that. This results in all three 6s being held as VoiceOver informs me. Next, I flick to the Roll 2 button and double tap

it, taking my second roll. The two free dice come up 5 and 2. Not what I hoped for.

I could take my third and final roll or score 25 in 3-of-a-Kind or Chance categories as my best options. I decide to take that final roll with the two free dice. The 6s remain held, and if you flick over them with VoiceOver, it will say "selected" before reading the value of the die. I double tap the Roll button, which indicates that this is my third roll. Sadly, I end up with the two free dice showing 4 and 2. In retrospect, I should have stuck with my original 27 points rather than the 24 points I have ended up with. I never like using my Chance slot so early in a game, which leaves the 3-of-a-Kind category as my best option here.

There are a couple of ways to indicate where you want to put the score. You can feel or flick through the score card and double tap on the correct button. Alternatively, to the right of the available actions, you'll find a list of choices containing your valid moves. I double tap on the 3-of-a-Kind button and am immediately routed to the Play button. Double tapping this will submit my score and end my turn. I could reconsider and change my mind at this point but choose not to. I double tap Play and end this round. It comes as some consolation that the artificial

player I'm contending with ended up with three 1s being its best option.

In games with human opponents, you have various ways of interacting beyond simply taking your turn. You can chat using a messaging system, exchanging typed messages with the person you're playing against. You'll see notifications of new messages as you take your turn in the game the two of you are playing together. You can also use the chat centre, which has all of your ongoing chats available. You also have the ability to nudge or remind players to take their turn. Games left unplayed for four days will be forfeited. Look around for even more options and style of play including tournaments. Full exploration of the Dice World app will prove rewarding.

Interactive Fiction Games

In earlier times, these games were once called text adventures. They've been around since 1976 when Colossal Cave made its first appearance on a room-sized mainframe computer on a university campus. In this classic adventure game, you type in simple two-word commands to explore a vast cave system and find various treasures. The genre has expanded over the years. There are now many different forms of interactive fiction. The unifying characteristics are that the games allow their players to advance a story by making choices.

For the most part, these games weren't designed to be accessible to blind players. Indeed, some puzzles in various text adventures would require a working knowledge of colours to solve. However, because they were based on text and used simple interface elements, they proved to be accessible to screen readers. I grew up playing and learning a great deal from these games. Fortunately, the iOS platform has proved to be fertile ground for such entertainment. They have a special place in my life.

Made by numerous developers, these games are based on stories where players must make choices affecting the outcome. These choices may involve solving puzzles and managing an inventory of items. They might involve simply choosing between alternatives regarding what happens next. There is a very wide variety of style in this class of game. You'll also find a very wide range of story genres. Everything from adventure, to romance, to mystery, to horror, to science fiction. The unifying idea is that a work of interactive fiction requires players to somehow be able to alter or progress through the story through their own choices or actions.

Easy examples for beginners would be Timecrest, Delight Games, Choice Of Games, and Hosted Games, which are all collections of games. In all these games, you can flick left or

right to read text and choices, double tapping on the choice you want. There are also often tabs across the bottom giving you access to different areas of the game like a screen with inventory or statistics on your progress. This easy-to-handle format has proved popular among sighted players wanting a change from the arcade or picture-heavy experience. The developers of games made in this style typically respond eagerly to suggestions and feedback and deeply value their growing good reputation among blind players. Another big advantage for beginners is that the need for typing is kept to a minimum.

Over time, what were once a deluge of separate apps each being a single story have been collected into library apps of stories that use the same overall system. For instance, all of the Choice of games can be gotten from within the Choice of Games app. You then purchase any titles you wish as in-app purchases. Alternatively, many of these libraries offer the choice of paying a subscription or a one-time fee for access to all current and future titles. Each story game can provide hours of fun without any time pressure or the need for fast reflexes. Everything waits until you actually make a choice.

I've often thought that games such as these would be very helpful for people who were learning Braille. You can certainly play them with a Braille display, reading the story much like a

regular book and making choices using commands from the Braille keyboard or simply via the touchscreen. Similar games once graced book and game stores everywhere in the world of sighted fun seekers. Called gamebooks, they weren't read cover to cover. Instead, a paragraph or two would be read before the player needed to make a choice and turn to a page elsewhere in the book. Many of these were quite complex, requiring the use of dice, pencil, and paper to keep track of statistics. At last, this same experience is available to us with the added bonus of your iOS device doing the work of keeping track of things for you. Pages and numbered paragraphs are replaced by simple links that you double tap on to make choices.

Choice Of Games

The Choice Of Games library is a collection of interactive story games that all make use of the same underlying system. Some stories are available free of charge. Others must be bought. Regardless, the same process of making an in-app purchase is used to unlock the stories and add them to your library. Choice Of Games LLC are the developers of the game system and use the "Choice Of" brand for games in this app. Games included are consistently of good quality. Often, they command fairly high prices compared to other games of a similar type. The developers license their system to third-party authors

through an off-brand app called Hosted Games. These games all use the same core system, but the games found in Hosted Games vary widely in terms of quality and style. for the purposes of this guide, we'll examine a game from the Choice Of Games library. I will presume that you have read about the app store and feel comfortable making purchases.

The Superlatives: Aetherfall

This is a highly rated game in the collection. many of these games cross genre lines. This one would fall into the "steampunk" category, where history is altered by advanced gadgets powered by steam are commonplace. In this case, the power source is called "aether". The superhero genre is also invoked. You play the newest member of a society sworn to protect Britain and Earth from various threats. The game begins with a few paragraphs introducing you to the world. Your choices start immediately as you need to decide how you've spent the night prior to the story. From the choices presented in the form of radio buttons, I select that I went on patrol with the police. After double tapping the radio button, I flick right and find the Next button. I double tap this to advance the story. I then select that I am a gentleman of superlative ability before flicking right and double tapping the Next button. I then select Spark as my nickname. Next, I pick Ingenious Inventions when

deciding what my specialty is. I am rewarded with text describing my earliest invention as well as the aether-powered wings I use to fly to the society headquarters. I double tap the Hurry Onward button to proceed into the story proper.

The game proceeds in this manner with each choice I make advancing the story. These games sometimes have some random elements, combat, and inventory management. However, the basic mechanics of making choices remains the same. I never have to worry about how long I take to decide something. Nothing happens until I make a choice. At any time, I can find a Show Stats button in the top left just past the Back button. This will let me examine any statistics I have in the game and may also provide access to inventory or other things.

There are four tabs across the bottom of the app. These are Store, Search, My Library, and Settings. The names are pretty self-explanatory. Take the time to explore each of these tabs. Some games in the store will be free or on sale. If you like this sort of game, it's a good idea to check in the store every so often. You can also receive notifications when new titles are added, which happens fairly frequently.

Frotz

For people wanting a stiffer gaming challenge including more of a need to use VoiceOver's review capabilities, typing,

or dictation practice, there's Frotz. This interpreter lets you download and play stories like the old Infocom adventure games such as Zork. There are hundreds of free games you can get from the interactive fiction database. Should you have copies of Infocom game files, you can actually transfer those to the Frotz app and play them. The app fully supports VoiceOver, which means you can play text games using a Braille display if you have one. Also, you can dictate your commands using the Dictate button found near the spacebar on the virtual keyboard. Double tap on the Input Command found at the bottom of story text. The virtual keyboard should appear with the Dictate button. Try typing "help" if you're stuck. After typing or dictating a command, find and use the Return key. You may also use a Bluetooth keyboard to type in commands that way.

There are literally hundreds of games you can play with the Frotz app. In 1999, I compiled a collection called *Rising From Time's Ashes*. It included games that I and others thought were the best interactive fiction available at the time. To give newcomers somewhere to start, I have included some descriptions of games that you can find and play from within the app. This is just the tip of a very large iceberg.

Jigsaw: An Interactive History

In Jigsaw, you start out at the dawn of the twenty-first century. It is New Year's Eve, 1999. You have been invited to the party at Century Park. There, you are attracted to a complete stranger, who vanishes into the crowds. He/she leaves behind a piece to a jigsaw puzzle. This turns out to be the doorway to a key moment in the past. The stranger, named Black, is trying to alter history to better our future. To save history as you know it, you must travel through time and solve a jigsaw puzzle where each piece is a doorway to a key historical event in the twentieth century. Your journey will take you to the start of the first world war, the sinking of the Titanic, the first powered flight, and many more key events in the twentieth century. Can you save history as you know it? Is it right that you do so?

Graham Nelson's second major work of interactive fiction is an absolute masterpiece. As well as offering its players vivid portraits of history with breath-taking attention to details, Jigsaw invites us to explore several moral issues. It is also the only game I've come across that goes out of its way to be completely gender-neutral. This game requires some knowledge of historical events, but its puzzles are logical and fair for the most part. The built-in help and documentation are quite

extensive and well written. However, no hints are provided for stuck players. For those interested, footnotes are provided to each segment of the game that give historical information for the different events. They make for fascinating reading. Note that you must access these from within the Help menu. Players with some degree of experience with interactive fiction should be able to win this game without unreasonable frustration.

To this day, Jigsaw remains one of my most treasured experiences with interactive fiction games. It took me around two years to finally win the game. I must confess to needing to resort to a step-by-step game walkthrough in a few places. More often, the help of friends proved sufficient to allow me past a puzzle requiring more knowledge of an event than I had. I enjoyed almost every minute of playing it. Also, I can honestly say that the game deepened my understanding and appreciation of history in a fundamental way.

The Haunted Theatre: An Interactive Night of Horror

In Theatre, you are a real estate agent trying to sell an old theatre. During your previous visit, you accidentally left your pager in the basement. You retrieve your pager and start to leave, only to discover that your car has been stolen, and a vicious thug blocks your exit. Your only course of action is to travel through the theatre and uncover its dark past while

surviving its supernatural dangers and other obstacles. The past is made clear in the pages of the journal of a young architect who worked on the theatre and fell in love with the witch you must ultimately destroy.

This game is especially good for beginners. Progressive hints for puzzles are available. It also comes with instructions and even a short story. Brendon Wyber has done an excellent job of designing this puzzle-filled game. Even experienced players should find this game entertaining, if not especially challenging. For older beginners, I usually recommend this game as a starting point unless they object to horror.

Appearing while I attended university, I nonetheless found myself utterly absorbed and compelled to win the game. Over around two weeks, I played incessantly enough to have doubtless lost marks in my classes. Winning proved very satisfying indeed.

A Bear's Night Out: An Interactive Children's Story

In A Bear's Night Out, you play the role of a cute and cuddly teddy bear who finds himself awake and aware. You must bravely explore the house that David, your owner, lives in. During your travels, you discover that a teddy bear picnic is going to take place. Can you find a way to get David to take you there?

This game has been specifically written for young children, but people of all ages can appreciate the excellent writing and careful attention to details that has gone into it. Answers to many of the puzzles are not immediately obvious, but all puzzles are fair and logical, and hints are available in the help menu. With a small bit of help from kind folks who are older and hopefully wiser, children should thoroughly enjoy this warm and friendly game. I recommend this game for novices to intermediate players. Experts will still doubtless appreciate the craftsmanship this game exhibits but may be disappointed with the mostly easy puzzles.

Anchorhead: An Interactive Gothic

Having only recently married, you suddenly find yourself leaving behind everything you have known to move to your husband's family property in Anchorhead. This coastal town is a fairly gloomy place, and you quickly discover that sinister forces are at work in your husband's life. Your husband is quickly being drawn into something, and your very life depends on unravelling the mystery surrounding his family.

This game won the 1998 XYZZY Award for best setting and was nominated for several others. Michael Gentry has produced a masterpiece of horror, which is apparently quite faithful to Lovecraft's writings. Reviews of Anchorhead described it as a

masterpiece of horror. Writing was very well done and avoided many of the pitfalls commonly found in such games. Timing and pacing were excellent, and the game's player-friendly nature also drew favourable comment. The vividly horrific and perverse circumstances the game goes into make it absolutely unsuitable for younger players. The game deals with such subjects as rape, incest, and cruelty to children. In defence of the game, it does this with the intention of staying true to Lovecraft's style and subject matter. Clearly, the author does not condone these perversions.

Christminster Abbey: An Interactive Conspiracy

Your brother's urgent telegram has brought you to the town of Christminster Abbey, where things are not as they should be. A conspiracy is afoot inside the halls of Biblioll College, and it turns out that your brother is somehow involved. Is he in danger? You must gain entry to the college and unravel the conspiracy to aid your brother. The town and university are full of interesting characters, and places are richly described. This is one of a growing number of games in which the player character is distinctly female. The documentation is quite good, and hints are available for desperate players. Characters are quite well crafted. I recommend this game for intermediate to expert players.

So Far: An Interactive Catharsis

In *So Far*, you start in a theatre observing a play. This play mirrors your life in some respects, as it deals with a lover's betrayal. It seems your wife is having an affair. A strange breeze eventually lures you into the heart of a shadow buried inside an abandoned room within the theatre. You must journey to four strange worlds, and beyond them in a quest to solve their mysteries and return home to find and possibly forgive your wife. Shadows become doorways, taking you to increasingly bizarre places.

This game has often been compared to the popular graphical game called *Myst*. The worlds you will travel through various shadows to reach range in nature from the ancient to the bizarrely modern. The plot seems barely held together by various performances that must be seen. Many of the puzzles are fairly tricky. This game is for the expert player and rewards thinking outside the box.

The Zork Trilogy

These three famous games were the first to be released by Infocom. They were the first to have the ability to understand sentences instead of merely two-word commands. Descriptions of all three games can be found below:

Zork I: The Great Underground Empire: You are a bold adventurer who must gain entrance into the ruins of an ancient civilization and discover its treasures. A simple house in a woods hides the entrance within its walls, and also serves as a depository for any treasures you might be clever enough to find. From this deceptively mundane beginning, players journey into a world of rocky canyons, an underground river, a room from Atlantis, the land of Hades, into a forgotten temple, and across a solidified rainbow, and so much more. Your opponent in this first game is a cunning thief. He may appear at any time to snatch a treasure or two, some of which are needed to solve other puzzles in the game. Until most of the game is solved, you must try to keep your distance, avoiding confrontation. Then, long after he has driven you insane and after you have made use of his talents, the tables are turned. You must hunt him down in his lair deep within a maze. There, you will enter into a duel to the death.

When playing, keep in mind that all of the puzzles in this game have logical solutions, even the seemingly random fights with the troll and the thief. The other fantastic monsters, including the vampire and the Cyclops, also have logical solutions to defeating them.

Zork II: The Wizard of Frobozz: This begins where its prequel left off. You start in the barrow with the familiar sword and lantern resting by you. Taking up these adventurer's tools, you enter a second part of the underground empire. During your stay, you will visit caverns, a garden, a bank, and a land right out of "Alice In Wonderland". You will command a robot, open a seemingly impossibly fortified door, rescue a princess, fly into the heart of an ancient volcano, and much more. Your rival in this game is the wizard of Frobozz. Although prone to the occasional fumble, this meddlesome mage has some truly diabolical spells. The effects of some spells are quite amusing, if frustrating.

While I played the game, I felt that almost anything was possible. The sense of being beyond reality is incredible. This time, logic doesn't have as firm a grip on things. My advice in most games is to stick to logic. Only when all else fails should you try anything out of the ordinary. In this game, however, this approach won't work. Try anything at all, no matter how ridiculous it seems. Anything is better than being reduced to the shame of looking at the solution, except, of course, being stuck at a hopeless point for all eternity. You may notice that this game seems to flow a bit smoother than the first one. Things seem less rugged, at least to me. The world seems a bit

smaller, if not more understandable. Unless you are really good at creative thinking, you may find Zork II exceedingly hard. Despite this, you should still enjoy the scenery. It is even better described than the scenery of the first game. For information concerning documentation and hints, see the description for Zork I: The Great Underground Empire. Due to the more intuitive rather than logical nature of the game, I must rate this game at an intermediate level of difficulty. I would still urge novices to explore the masterfully crafted environment. You can prevail with a bit of patience.

Zork III: The Dungeon Master: The last part of the journey through Zork is the smoothest, best written of the three. While there are none of those bothersome mazes to worry about, there is something even worse. It is called the royal puzzle, and it lives up to its name. It is very hard to fix things if you make a mistake. It took me days to solve that thing. Each wall you push will affect others. The object is to get the ladder under the hole. I strongly recommend saving the game before starting this puzzle.

Aside from the royal puzzle, I found the rest of the game to be spectacular. The descriptions and plot are marvelous as is the final conclusion. Once again, Infocom presents a game that seems to take the player to the ends of the universe. From the

bottom of the endless stairs, you travel to an underground lake, across an aqueduct, through a royal museum, and through time itself. All the while, the dungeon master tests you in his many guises. You meet face-to-face after trials of all sorts near a fiery inferno.

Besides having the greatest scope, this game seems to be the most logically laid out. For the most part, navigation is fairly easy. The only possible exception to this is the Land of Shadows. That place can get a bit confusing. Perhaps, this logical organization is what makes the game seem smaller than it is. Like the other two games in the Zork trilogy, I found it difficult to rate this game. I'll put it to you this way: If you can handle the other two Zork games, you should be able to manage the final chapter in this saga. Intermediate to expert players should find this game quite challenging.

Although the Zork trilogy is still given its due as historically important, it has suffered from neglect and comparison to what has come after it. Essentially a collection of puzzles and treasure-hunts, Zork is now seen as a fun sort of rite of passage for players. I very much enjoyed all three of these games and will doubtless revisit them in the future many times.

Word and Puzzle Games

As one would expect, games about words tend to be very popular among blind players. So are various puzzles. These games tend to have a lasting appeal. Another advantage is that they often aren't as complex to program and can remain viable even without constant maintenance updates from their creators. In this subsection, we'll briefly cover a number of these kinds of games. Simply search for the name of a game you're interested in using the app store.

7 Little Words

Almost from the start, this particular game has been a continuous favourite and has remained fully accessible using VoiceOver. The object is to order a set of tiles correctly to form seven words that are somehow related to each other. Each of the seven words has its own clue, but all words are made from the same collection of tiles. A tile can only be used once in a puzzle. There are fresh free puzzles available each day. Additionally, there are puzzle packs available for purchase, offering themed puzzles as well as puzzles designed to be easy, moderate, hard, or "impossible". At this point in the game's unusually long life, there is enough content to keep any wordsmith happy and busy for ages. New puzzle packs are introduced regularly. Every so often, new economic models are

introduced such as one that gives unlimited access to all puzzles on a monthly basis. Hardcore players may find this a better option than purchasing puzzle packs individually. On the other end of the spectrum, many players are quite happy just playing the freely available daily puzzles. There's never any nagging or pressure to purchase puzzle packs. The game is updated very frequently.

Ordet

In this game from La Nausé, each level features a group of words that use the same seven letters. Finding longer words yields more points. You submit words via the keyboard found at the bottom of the screen. Double tapping the letters on the letter bar near the top will remove them from your current guess and return them to the keyboard. Find all the words in a level to proceed to a new one.

Despite not being updated in over three years, this game still works and provides a good challenge. It is easy to control and should be suitable for all ages. There is an Ordet Lite version that you can try before purchasing the full Ordet app.

Four Down

This app brings over forty crossword puzzles to your iOS device. The puzzles are fully accessible to blind players. As you flick right across the grid, you will hear the clue for the

word you're on. Double tap on the text field to enter a guess. Despite not being updated in over five years, this app still works, bringing a total of forty-eight puzzles to blind enthusiasts.

Black Box

This clever game is available free in the app store but has some optional in-app purchases. It won numerous awards including for its accessibility for blind players. Basically, Black Box turns your iOS device into a series of puzzles. Most of these don't actually involve manipulating items on the touchscreen. The clues appear on the screen, but the puzzles involve different aspects and capabilities of your iOS device. If you get stuck, there are hints available in addition to the initial clues given for the puzzles.

I hesitate to give anything away here and spoil a puzzle. However, perhaps, a simple one will serve as an example. Skip to the next third-level heading now if you don't want to have a puzzle spoiled. Get the game and just start playing. Still here? Alright then. You've been warned.

When you begin this puzzle, you hear the noise of a bunch of balls being dropped. You are also given the number of balls present. This changes slowly over time. Additional Balls might appear or balls might be taken away. The solution to this

mysterious collection of balls is that they represent the power contained in the battery inside your device. Plug your device in so that it charges fully. That solves the puzzle. Think outside the box to solve the many puzzles in this most unique puzzle game.

Diced

In this free casual puzzle game from Agile Tortoise, you play on a five-by-five board. You must place dice in these squares in such a way that you create combinations of dice. For instance, you could have five matching dice in a row. Alternatively, you could have dice with the numbers from 2 through 6 or 1 through 5 in a row. When a combination is created, the dice disappear, scoring you points. If you take too many moves to create a combination, a block is placed on the board, making things even harder. Other than the value of the die you currently hold, you are given the value of the next die that you'll hold after the current one is placed.

There are a number of things that sweeten this basic design. Wild dice can be worth any value. You start with three bombs that can be used to destroy dice around where they are placed, freeing space on the board. Three different game modes are available to suit different styles of play. All of this adds up to a marvelously flexible and replayable puzzle game. You'll

also want to check out other apps by Agile Tortoise. This developer really cares about accessibility.

Blindfold Games

Type "kid friendly software" or even just the word "Blindfold" into the app store search field, and you'll come across Blindfold Games. These games are programmed by Marty Schultz who took a keen interest in developing games for blind people using iOS. Working with feedback from blind students and other interested parties, he has come up with a unique gesture-based menu system and control scheme that can be found in all of his games. This greatly reduces the learning curve, leaving the user free to master whatever the actual game that has been chosen rather than its interface.

Over time, Marty is rebranding the games to "Ears" rather than "Blindfold". He is also branching out into a more educational game direction with his Objective Ed software for use with schools teaching students with disabilities.

There are over fifty titles in the Blindfold Games and Ears brand games so far. The games all use similar gestures and feature-spoken help and instructions. They are easy for beginners to pick up and start playing. Titles include Pinball, Wild Card, Breakout, Travel Cards, Racing, and many more. Games tend to be simple overall and are either card/puzzle games,

games relying on ball physics like Pool and Pinball, or other simple matching or word-guessing games. The developer, Marty Schultz, is quite eager for any feedback or suggestions. His games are free to try, but you can purchase upgrades, including unlimited play, if you find a game you especially like or want to support future efforts.

Beginners will especially benefit from this wide and varied range of relatively simple family-friendly games. They are good for developing hearing, hand coordination, and memory skills, among many other skills. More veteran gamers may find them to be rather tame and simplistic. They shouldn't go in expecting games comparable to what their sighted friends are engaged in using the latest consoles. Blindfold games don't typically demand arcade level reflexes or rapid complex thinking. They're good clean simple fun.

Marty is one of the most prolific but controversial developers of accessible games you'll find in the app store today. He has made a serious attempt to actually earn a living creating games and discovered how brutally hard that is especially when developing for a niche market. When Apple revamped the app store and encouraged developers to consolidate their similar apps into one app, Marty resisted doing this. At the time, he had well over sixty apps in the app store, many of

them similar such as card games. Consolidating them would have been a monumental chore for one person and wouldn't have offered any economic return for all the effort. Also, Marty was worried that new games added to these consolidated apps wouldn't be discovered as readily. many in the blind community felt that Marty shouldn't have been given an exemption to the new policy. This would have resulted in his shutting down and the loss of all of his titles from the app store. Personally, I'm rather glad he got that pass. His games and the standard system of gestures he has developed are easy for beginners who are just starting to use their iOS devices. Only a few of his titles hold any lasting interest for me. I favour more complex games for the most part and have often wished that Marty would take things further than he ultimately does. A prime example of this is the Blindfold Pinball game I discuss below in the next subsection. It's a wonderful basic game and proof of concept. However, for Marty, the effort he puts in has to be economically worth doing. He has a lot on his plate, and I can appreciate how thinly stretched his time and energy are.

Audio Games

With the computing power in your iOS device, it is possible to create quite sophisticated games that use sound as their chief method of output. Players can control the action with

their voice, through a set of gestures, or by holding, tapping, and tilting their devices, etc. We've seen some of the best audio games ever created disappear from the app store due to the inability to justify the cost of keeping them updated to work as the iOS operating system changes how it handles sound. These games were well advertised, perhaps too low-priced, and had famous actors doing voice work. Despite all those advantages, they simply didn't sell enough. Keeping them working on successive versions of iOS would cost too much for too little return on investment. They have sadly disappeared from the app store. I'll never forget standing in the basement of a burning house in the game Papa Sangre II. The sound design was incredible. As you physically turned your body while holding your device, your perspective on the surroundings changed as it would in real life. Bapping the bottom corners let you move forward, trying to follow a scared housecat to the exit, thereby escaping the fire. Wooden beams would come smashing down right behind you or crush you if you didn't move fast enough to avoid them. It was glorious auditory fun, the like of which we may never see again.

Rather than tease you with wonders from the past, I'll cover some audio games below that have so far stood the test of time and grim app store economics. The market for audio games

is, unfortunately, a small one, so I included the example above to encourage you to enjoy what you buy lest it disappears before you are able to do so. The more complicated an audio game is, the more vulnerable it is to being broken by changes in iOS having to do with how audio is handled.

Blindfold Pinball

The ball bounced off the top bumper causing an electronic beeping in the centre of the stereo field projecting through my EarPods, scoring lots of points. It initially angled left but struck a bumper along the left side, changing direction, and sped across the centre of the table. I got ready to activate the right flipper. The fast countdown from three to one began, indicating the ball was in range of my flipper but also in increasing danger of falling down the hole and out of play. I tapped the bottom right corner of my iPhone as the countdown reached one. That was a very close call, but my flipper was fully powered and struck hard, sending the ball upward and left to strike and bounce around bumpers before zooming through a side tunnel on the left. I had to act quickly to catch it with my left flipper or it would fall out of play.

And so the action continues in one of Marty Schultz's masterpieces, Blindfold Pinball. This uses the touchscreen and audio capabilities of your iOS device to bring simplified but

fun pinball action to blind players everywhere. While you won't find the same level of complexity that would be present in modern ordinary pinball tables, the basics of pinball action are wonderfully realized. As a veteran more hardcore gamer, I find myself wishing Marty had taken things further in terms of complex objectives and missions. However, for the purposes of an introductory audio game experience, Blindfold Pinball squarely hits the sweet spot of challenging but easily comprehensible fun. You can become used to tapping quickly and in time to score points. There is ample documentation and help provided, as well as a wide variety of available sound packs.

Audio Wizards

This game is terrific casual arcade action fun. You are an apprentice wizard who must help defend your enchanted land from elemental demons. Use simple swipes to select and cast spells at your enemies. Some enemies require multiple hits to defeat them. Play well enough, and you'll gain a super spell that hits any attacker for a limited time. Otherwise, you must select the correct elemental spell to damage opponents. If a demon reaches you before you can destroy it, you will lose a life.

There is a Story mode featuring a voice actor playing the part of your master wizard. This mode takes you from learning how to select and cast spells through a large adventure with

numerous levels to complete. You will also find an Endless mode awaiting your pleasure. This is good for practicing your skills so you're ready to conquer more difficult levels. also, it's different every time, making the game replayable even after you've gone through the whole story. The game fully supports VoiceOver, which is used for starting play and making mode selections. It is suitable for all ages, and the gestures needed are very simple ones. Winning the game isn't so simple, since things get faster the farther you get.

A Blind Legend

Here's a game that is far grander in scope and offers more complex audio challenges. A game developer teamed up with Radio France to produce this fully accessible audio adventure game. It's still being updated occasionally and is free from the app store. You don't need to use VoiceOver to play the game. It requires headphones or earbuds and uses stereo sound. You play Lord Blake, a blind knight whose wife has been kidnaped by an evil king. You are led through the land on a quest to rescue her from the evil King Thork by the voice of Louise, the brave young daughter of Lord Blake. She provides you directions past obstacles. You are able to move around through using swipes and gestures on your device. Timing is often critical. You also need to fight enemies with your sword. You'll hear their taunts and

attacks come from ahead, behind, the left, and the right.

EarPods, AirPods or other headphones are essential to play this game.

The developer of this game is eager for feedback. It has survived longer than I thought possible in the app store for which I'm very thankful. It's such a good illustration of what's possible in terms of audio gaming. While you don't need to pay anything to fully enjoy this game, it is possible to purchase lives so you don't have to wait for them to gradually recharge. That's one way to support this developer.

Super Tile Smash

Get ready for a fun puzzle game rich in audio. In this game, you need to destroy matching tiles on a grid by tapping on a tile with matching ones connected to it. In each level of the game, you need to destroy a higher number of tiles to move on. There are special tiles such as rockets, sidewinders, stars, and falling blocks to spice things up.

While the core principle is simple, this game can become very challenging. It also features different modes of play to keep things interesting. Designed for players of any level of sight, this is a game you can enjoy along with sighted friends and family. There are many different tile themes that alter the sounds used, as well as tile pictures. Sighted gamers have

enjoyed casual puzzle games like this for years, so I'm glad to see them made available for blind players on iOS. Woodside Apps, the developer of Super Tile Smash, has also created another game called Knight Commander. This is a totally different strategy game, putting you in charge of a village where you must build defences and complete quests. These two games show great promise, and I keenly look forward to more from this developer.

Feer

This game is what they call an "endless runner". Your character runs at an ever-increasing pace through a hostile world, trying to survive as long as possible. There is no ultimate victory. Just a continuing series of challenges. You hear the hazards and power-ups appear ahead, to the left, or to the right of you and must act fast. Duck ravens, jump over hands reaching up from graves, and dodge zombies. This is a very well-built game that is also enjoyed by sighted people as there are some graphics.

The game doesn't cost any money beyond the initial purchase price. However, it offers the chance to earn and spend "fairy lights", a kind of in-game currency, on upgrades to make your next journey easier. These upgrades might cause your power-ups to last longer, for example. You can also spend fairy lights on

resurrecting if you are killed in the game. This is useful for completing more arduous quests.

Alt-Frequencies

This is a science fiction thriller. You are able to listen into radio stations on what should be just another ordinary day in England. Britain is considering implementing a new technology that would cause time to loop small amounts into the past. This would allow for mistakes to be corrected, disasters to be averted, etc. However, there was supposed to be an election to decide whether to flip the switch or not. It seems that the time loop technology may have been activated without public consent.

You are able to listen to a number of different stations. To move forward through the story and solve the mystery of what's happening, you can record media from one station and send it to another broadcaster's show. Doing this can change what happens as people react to the items you broadcast. The trick is to cause enough memorable attention to be drawn to what's happening prior to the time loop being encountered so that you can move farther along in the story.

Use simple gestures to switch between stations. When you hear something useful, swipe down to record questions or other samples from what you're hearing. Next, switch to another station and swipe up at the right time to interject your sample

or question into the current show. This will cause reactions among the broadcasters and listeners, leading to new consequences. The sound work in this game is very good, and the mechanics are very easy. Finding the correct path through the story is something else entirely.

the sound and voice acting in this game are splendid. The mechanics are fairly simple even for beginners, making this an excellent game to start with. There are some intense scenes and the odd bit of bad language, so I'd recommend this game for teens and above. As with most audio games, I recommend you wear headphones during play.

Audio Game Hub

This small collection of games in a single app is another development worth checking out. You get eight audio games in the app, and they've just done a Kickstarter to fund games now being worked on for PC, Mac, and iOS. The first appearance after this Kickstarter was a game simulating Cricket as played by blind people called Blind Cricket.

Unfortunately, it is unclear at this juncture whether anything is in development with Audio Hub. I haven't seen any news in well over a year.

Board and Card Games

A flat tablet obviously lends itself well to digitized versions of board and card games. Of these, a small but slowly growing number are being made accessible to VoiceOver users. Players can feel the board on their touchscreen and hear what lies beneath their fingers. Double tapping on a piece in Chess or another board game involving pieces would indicate one's intent to move the piece. The player would then find and double tap on the area where the piece should be moved to affect this. Similar processes allow for the flicking through and playing of cards in one's hand.

A nice aspect of most board and card games is that they allow for play between people either in the same location passing the device back and forth, or over the Internet between devices each having the app installed. These games are also typically widely familiar to people even if they haven't played computer games before. Many innovative approaches are used by developers. In Backgammon with Buddies, the app must be used in conjunction with the Messages app in iOS. Your moves are sent to your opponent as messages that then tie into the app. At that point, players would use the app to examine the board and make their next move, which is sent as another message. All very clever indeed.

There are two settings in VoiceOver that are profoundly useful while playing board and card games. The first is having VoiceOver Hints enabled. In most contexts, these are short instructions such as "double tap to open" and other such sentences that help you know that is possible. Often, games will use this hint system to reveal information that you would otherwise have to more actively seek out. You might hear cards similar to the card you're hovering on that are in your hand or that have been played. You might hear the status of a piece you're on or what the face of a die is showing. A lot of timely and useful information can be imparted through the VoiceOver Hints system. As an experienced user, I often disable the hints while I'm working. However, I always enable them while playing games. They speed up the process especially when app developers take the time to use them to their best potential.

The other critically important setting to know about is Vertical Navigation. This is a setting you must point the rotor to. Rather than moving horizontally by character, word, or line at a time through a document or text on the screen, Vertical Navigation lets you move directly up or down without moving the column you're in. This lets you examine the column in a table or lets you flick up and down to reach elements of an app's interface that are directly above or below each other. This

makes it possible to examine a game board and move pieces. You can explore by flicking in all four directions, quickly getting a sense of where everything is.

On the subject of the rotor, remember that many developers are using the ability to add custom rotor menus that become part of the main rotor while you're in a particular app. These can greatly facilitate making moves and quickly examining the board or state of play.

Chess

There are a good number of accessible Chess apps. Many of them have stood the test of time well as iOS has upgraded over the years. Chess-wize, Pulsar Chess, and Shredder Chess are three notable examples in the app store. My geospatial skills aren't well suited at all for the advanced move planning needed to be a good player of the game. I will therefore leave it to wiser heads than mine to point people to "the best" of these apps.

Shredder Chess

Shredder Chess has been in the app store for years and was recently updated in April of 2020. It allows for online play against opponents or play against the Shredder Chess engine. It costs 5.49 Canadian in the app store. This app will serve as our

example board game. Other Chess apps are operated in similar fashion but may boast a different set of features.

Once you launch Shredder Chess, you'll find the top of the screen taken up with the game board. If you're playing white, you'll find the squares from A8 through H8 right below the status bar. The white piece will be at the bottom. Below the board, you'll find information on the status of the game. This will include captured pieces, whose move it is, and other information. You will also find Hint, Redo Move, Move, Disc, and Action buttons. At the very bottom, you'll find a series of five tabs. These are Play, which you start in, Puzzle, Rating, Info, and Settings. Other Chess apps will display a similar board and have other features in separate tabs. Having a full board displayed pretty much requires apps to have two or more tabs to deal with other features important to players.

Once I've hit the Actions button and selected New Game, I can make my first move. Setting my rotor to Vertical Navigation, I touch near the bottom of the board on the screen, which is over halfway down. I end up on C1. Wanting to move my pawn at E2, I flick up once to reach row B and then flick right to reach the pawn at E2. I double tap on this pawn and then flick up twice to square E4. Double tapping on this square completes my opening move. The computer then makes its move, and this is

announced by VoiceOver. You can then examine the board at your leisure as well as the information beneath it that will also contain the last move made.

While the engine at the core of this game has been outperformed since its creation, it should be more than sufficient for beginners through to experts. You can set its level of competence along with a great deal else in the Settings tab at the far right. Those wishing to play different variants of Chess such as Atomic chess or Crazy House, might prefer a more recent app called Pulsar Chess. This seems more geared towards play between human players but also has a long-established Chess engine for play against your device. Both apps should be very suitable for beginner players to learn the game. Shredder Chess does have somewhat more available in terms of help.

Lost Cities

This very special card game was designed by Reiner Knizia, a famous board game author. Compared to a two-player game of Solitaire, Lost Cities has a visual theme of going to ancient mythical places. While blind people largely miss out on the eye candy present on the playing cards, the game itself is wonderfully accessible. It includes a human narrated tutorial plus well-written rules to help people get started. There's no

time pressure as the game waits patiently for your next move. Wait long enough, and you can hear the music that people who don't use VoiceOver hear as they play the game. You can play against computer or human opponents.

There are no tabs to worry about in this app. You start in the main menu of Lost Cities. Flick left and right through the options and double tap on what you want. First time players will want to look at the rules. For this example, we'll play a game against Ms. Lindenbrock. She's an artificial intelligence player complete with simulated emotions and play style. I've won and more often lost a number of games against her. As a first move, she plays a "coin" in the white lane. There are five lanes in which cards are placed. There are five colours or suits of cards, and the "coin" cards are special, taking the place of number one. Each suit has cards from coin up to ten as the highest card. You need to play the cards in sequence from lowest to highest in their lane. You are allowed to discard a card rather than playing one during your turn. Each lane starts with a value of 0 points, but 20 points are deducted the moment you play a card. You therefore need to play enough cards to make up those 20 points for it to be worth while playing a lane. Coins are special. They must be used before any other cards are played

in a given lane. Each coin multiplies the total points in a lane, so Ms. Lindenbrock now has a score of minus 40 points.

I touch near the bottom of the screen below the lanes and discard piles. Flicking right through my current cards, I find that I have a red coin plus the 2 and 5 red cards. Playing the red coin seems like my best first move, since I can then play the 2 and hope for useful cards to be drawn in each of those turns. I double tap on the red coin, which selects it. I am then automatically moved to the Play button. I could still change my mind, opting for another card, but I'm certain of my move so I double tap the button. I am then moved to the draw stack and can draw a new card. It turns out to be one of the yellow coins, which wasn't what I had hoped for. Ms. Lindenbrock then plays the yellow 4 card. The game continues in this fashion. There are sounds for cards being played and selected. You can feel the board at any time, discovering what cards are in which lanes. Also, thanks to the VoiceOver Hints system, you'll receive all of the information you most often need during play simply by flicking through your cards. Lost Cities was developed by TheCodingMonkeys and costs \$2.99 in the app store.

BitLife

Very popular among blind and sighted players, this style of game attempts to simulate the decision-making aspect of life.

Starting out as a child, you choose from a growing number of options and areas to focus on as your character ages through childhood into adulthood. Although you play as a single player, you can nevertheless take part in community challenges and ongoing discussions among players.

There are a growing number of these games in the app store. Although they weren't originally designed to be accessible, developers have been quite responsive to blind players who found the largely text-based games to be somewhat accessible. Popular titles in this space include Life Simulation and a classic from the 1980s called Alter Ego, which is fully accessible to VoiceOver. By far, the most extensive, accessible, and continually popular of these games is called BitLife. It was created by Candywriter LLC and continues to be expanded and updated regularly. Although subsequent apps by this developer are graphical and not accessible, the developer has been very responsive to blind players and has made certain that BitLife remains accessible to VoiceOver users.

Starting a new game, you can either let factors be random or flick right through various choices. The game uses standard form controls including pickers, buttons, etc. One thing to be aware of is that there are a lot of popup windows. When you double tap on an area such as Activities, a window pops open

that overlays other parts of the game. Before you can do something like go to another area of focus or reach the main menu, you need to close any such open windows by making a choice in them or finding the Close button that makes them disappear. This is a good app for learning how to use form controls and deal with something that wasn't originally designed to be accessible to blind players. Note your statistics near the bottom of the screen. These will change according to the choices you make. The thing that sets these games apart from roleplaying games is that there's no grand quest to solve. Games like BitLife are all about living through a simulated life and making of it what you wish to. To be successful in a job interview, you can help your prospects by improving your smarts stat as well as possibly your looks stat. To survive a violent encounter, your health and strength scores come into play. Just like in life, how you spend your time matters.

A Dark Room

This is a very unique creation. Elements of the experience are timed. It is a text game with statistics, resource management, a map, and other complexities, but the author has made certain that it's all fully accessible through VoiceOver. After being made aware of interest from blind players, he has become a strong advocate for making games accessible where it's

possible to do so. He built an alternative ending section of his game so blind people could complete it.

In addition to making good use of VoiceOver's Hint system, this game also contains bonus material recorded by the author that only blind players will find. If you enjoy A Dark Room, you may also like the prequel game called The Ensign that has a similar style.

Six Ages: Ride Like the Wind

The Tandora clan wasn't off to the best of good starts. Having settled in a valley on the right bank of the Eel River, they were slowly building up their lands and defences. An attempt was made to finish building everyone's houses. Sadly, it ended in failure as cooperation broke down among clan families. A subsequent raid by trolls had exacted a stiff price from the clan, despite aid from another in the area in fighting them off. As the second year of settlement began, an effort to clear sufficient pastureland while everyone was still healthy seemed reasonable. To increase cooperation, the appropriate blessing was asked of the earth goddess Nyalda, and a shrine was built in her honour. This seemed to work as the attempt succeeded and the shortage of pastureland was seen to properly with minimal injury. Perhaps, with the shrine providing a permanent boost to cooperation, an attempt to finish building homes would succeed

in the following year. Meanwhile, more warriors needed to be recruited, and a watchtower was built to aid in the defence of this still-fragile settlement. In this world thrown into disarray by ongoing struggle among the gods, could the Tandora clan hope to thrive? Only time would tell.

This was how a game of Six Ages: Ride Like the Wind began for me. In this game, you must make decisions on behalf of a clan of horse riders who have been forced to flee their city due to climate change caused by a war among the gods. Players must become familiar with the ways and highly developed mythology of Glorantha, the bronze age fantasy world upon which the game takes place. Chance, learning the mythology, and risk management skill all play a part in this grand combination of a choose-your-own adventure gamebook and strategy simulation.

Certainty is very fleeting as even poor choices can sometimes succeed and even the best choices come with a chance of failure. Make choices for the characters who make up your clan and get to know their personalities as they grow older, more skillful, and wiser. The better you know your people and the cultural narratives and forces at work in their lives, the better you will do as a player.

In addition to lessons in leadership and managing the consequences of one's choices, Six Ages is a stunning example of

the kind of accessibility that is possible when developers think about it from day one and use the tools Apple has built into the operating system. The app developer has made extensive use of the VoiceOver Hint system, reducing the need to go looking for information. The exploration and map system has been simplified, so blind people won't struggle with that aspect of the game. All of the decisions regarding exploration must still be made. The only change is that a system has been devised so there's no need to deal directly with the map in the course of the game. The map was a large hinderance to blind players attempting to play A Sharp's first game, King of Dragon Pass. This game is also accessible and worth checking out. However, Six Ages is a much easier game for beginners to dive into.

Besides easing aspects of map exploration, Six Ages features many other improvements such as a deeper, more complex combat system. Nothing happens until the player makes a decision, so there's never any rush. Another welcome surprise was the inclusion of descriptive text specially written for blind players. This text is found after all of the options and other text but only appears to VoiceOver users. Different scenes and other works of art found in the game are described for blind players. Adding in these descriptions is an ongoing process, and more are found after each update. Six Ages: Ride Like The Wind

is the first game in a planned six-game set that will allow players to see how their clan fairs over different periods of history in the world of Glorantha.

The game can teach many lessons about leadership, consequences, risk management, and relationships. It also reinforces all kinds of skills including swiping, double tapping, careful screen exploration, and other basic skills. It turns these activities into steps in an epic journey so full of other interesting aspects that you won't even realize you're mastering screen reader basics.

Fun with Your Web Browser

One way to have games work on numerous different platforms is to have them be played through use of your web browser. Usually, these games are run on a central server and website. People can visit that site, log into their account on the server, and play the game using whatever web browser is handy to them. Many of these games are accessible to blind people.

Other Opportunities for Fun

But wait! There's more! Lots more! So far, I've been telling you about fully programmed games. However, there are opportunities for solitary and social play beyond these that still take advantage of the capabilities of your iOS device. We'll briefly touch on some of these possibilities below.

Let's start with books. Amazon makes several gamebooks from various authors available as Kindle books. Rather than having people scroll through the book looking for the correct paragraph to turn to when making a choice, Kindle books have active links that take you instantly to the right spot when you activate them using VoiceOver. Just turn your rotor to Links and flick up or down to go through and find the correct link. At that point, double tap on it. Usually, these books aren't merely just a set of such choices. There are dice and statistics involved. That's not a problem, though. You could easily use apps like the Notes app to keep track of statistics and other important information. As for dice, have no fear. There are a number of simple and accessible dice rolling apps, one of which is Ready to Roll from Blind Sparrow Interactive. This dice roller is specially built to be equally accessible to sighted and blind gamers. It makes use of audio cues and gestures to be easy and quick to operate. All results, help and instructions are read aloud by a human voice rather than VoiceOver. Another popular choice here is an older app called Natural 20. The author took the time to make the app fully accessible with VoiceOver. It is very powerful and easy to customize to whatever your particular gaming needs might be. This includes creating special dice or cards. It doesn't have the same audio perks and atmosphere as Ready to Roll;

however, this app has stood the test of time very well and remains popular among blind and sighted players.

I doubt that I have discovered every Kindle gamebook out there. However, here are some that I've found. The Critical If series of gamebooks includes *Down Among the Dead Men*, *Heart of Ice*, *Once Upon a Time in Arabia*, *Necklace of Skulls*, and possibly others. Another popular and fully playable trilogy of gamebooks is called *Destiny Quest*. These are written by Michael Ward. The series starts with *The Legion of Shadows*. The story continues in *The Heart of Fire*. The initial trilogy ends with *The Eye of Winter's Fury*. A fourth book, *Raiders of the Dune Sea*, is presently unavailable as a Kindle book.

Beyond these single-player gamebooks, you can also obtain other books related to games. There are many excellent books related to game design that could help you create your own games. Also, there are core rulebooks, sourcebooks, and campaign or adventure books for various roleplaying game systems. In a roleplaying game or RPG, you and other players basically collaborate to tell a story together. Most of the players play the main characters in the story, making decisions and dealing with the consequences. usually, one player is the game master and controls the situations and other characters encountered by the players. There are rules governing what happens so that it's

an actual game and not just a shared storytelling. Dice and statistics are often used so that neither the game master nor the players are in full control of how events unfold. Many of these are available as Kindle books. However, I have gotten most such books as PDF or ePUB books directly from the publishers of the various games and RPG systems. Also, many of these books are included in bundles sold at places like www.drivethroughrpg.com and www.bundleofholding.com and a personal favourite www.storybundle.com.

I would use an app like Voice Dream Reader to read such titles. It makes navigating ebooks very simple. Most of these ebooks are sold without any digital rights management complicating things. I keep copies of any such books I purchase in iCloud as well as in the app I'm reading the books in. They are then always at hand ready for use.

A lot of the material for the latest edition of Dungeons & Dragons can be obtained in an app called D&D Beyond. The various books can be purchased from within the app and may also be read quite accessibly in the app. Tables and charts may require sighted assistance for ease of understanding. However, the rules themselves are certainly fully accessible.

There are other publishers who have gone out of their way to make their RPG system materials accessible to blind users. These include:

Chaosium Inc.: www.chaosium.com – This long-established company is responsible for the highly regarded Call of Cthulhu and RuneQuest game systems, among other excellent offerings. All of the rules and adventures and such are offered electronically, and it's all very accessible for blind readers.

Monte Cook Games: www.montecookgames.com – This well-established game developer is widely praised for the Cypher system that can be used to tell any kind of story. They also have the more mysterious Sci-Fi-based Numenera system that focusses heavily on exploration and discovery rather than combat. Their family-friendly No Thank You, Evil! RPG system is suitable for all ages. All of the book and campaign materials are available as very accessible ebooks. Monte is eager to include everyone and has been making his ebook material accessible to screen readers for quite some years now. More recently, Monte Cook Games used Kickstarter to fund the launching of a line of books to aid in improving the RPG experience. These include Your Best Game Ever, Stay Alive, and other titles.

Some people skilled in the use of spreadsheets have put their capabilities to use in the service of fun. They have created complex character sheets for efficiently keeping track of statistics. Also, I've heard of people using spreadsheets as a way to set up accessible game boards using cells as spots. You need to be willing to do all the moving of pieces and updating of conditions or cards in play manually. However, people have successfully done this while apparently having fun.

There are many apps built specifically for the purpose of aiding in the play of tabletop roleplaying games. This includes the Roll20 app and web service. Apparently much of the app and website are accessible to blind players.

Other Accessible Online Games

There have been browser-based online games as well as multiuser dungeons for decades. Nothing at all stops blind people from playing these using their web browser or specially designed apps like MUDRammer. There are lots of these games around. Playing them is certainly a great way to become practiced at typing, reviewing the screen, and using form controls on websites.

I'll leave it to you to find these games and learn to play them on your own. However, as starting examples, I would recommend checking out two browser-based games that have stood

the test of time. The first is the oldest. It's called Sryth. Think of the gamebooks I discussed above. Sryth is a lot like that only it keeps track of everything. You just have to make decisions for your character. Sryth has continued to expand over the past seventeen years and is now absolutely massive. You play as a single player, but there are community contests and tournaments you can enter. The developer has done a great deal to make certain Sryth remains accessible to blind players including using alt tags to describe pictures and maps. Find it at www.sryth.com. You won't regret signing up for an account and joining the adventurer's guild.

Another excellent browser-based game for people more into science fiction than fantasy is called Tau Station. The developers of this adventure in the far flung future were keen to have their game be accessible to blind users. This is what is known as a massively multiplayer online game or MMO. Thanks to the accessibility work done on the game, blind players are on an equal footing with sighted players in the gigantic universe of choices and adventures. You can find it at www.taustation.space.

Where Blind People Stand in iOS Gaming

I think that it's very important that we go into this area with realistic and reasonable expectations. Many games simply require sight to play. Any attempt to make them accessible would

so fundamentally alter the game experience as to constitute a completely different game. Ian Hamilton, based in Australia, is a strong advocate for accessible games. He points out that all games involve some sort of challenges and that this essentially means that standards for accessibility must differ from other industries. Games often simply can't include everybody and remain true to themselves. For instance, some games can induce seizures in epileptic people. Others demand a level of visual perception. Games reliant on audio are splendid for blind people but exclude those who cannot hear or who have poor hearing. My own hearing loss has rendered games based heavily on echolocation somewhat less attractive to me than they once were.

Bearing this in mind, we're in a paradoxical position as blind consumers of iOS games. On one hand, we still face the classic situation where around 95% of games are inaccessible to completely blind players. It would be foolish to presume that a game picked at random from the app store was accessible. At least one blind person thought to try Super Mario Run from Nintendo when it was released in late 2016. Very quickly, an entry on AppleVis chronicles the disappointment possible when expectations exceed the reality of where we stand. Thankfully, the game was free to try. It takes a special effort and careful well-considered use of sound to make arcade-style games

accessible. There's a big difference between using sound as ear candy and a minor source of information and using sound as the only source of critical information. Don't expect even large companies like Nintendo to put in that level of extra effort. I believe it would be quite possible to make a similar audio arcade game fully accessible to blind people. However, it would take expertly considered audio design and extensive testing by blind gamers. It's more than simply adding sounds and spoken textual information. The small number of blind people who would be at all interested in a given specific title makes it hard to justify the costs involved.

The odds are far better with smaller app developers especially if accessibility is brought to their attention early while they're working on their app. It is much easier and less costly to plan accessibility from day one than to add it in later. The same goes for instilling the kind of thinking that leads to a real desire to put in the effort to make games as inclusive as possible.

The iOS platform greatly lowers the resources and effort required to make many kinds of games accessible. At the same time, the economic environment set up by Apple is a favourable one for smaller developers or even single individuals skilled in programming. There has never been a situation where the

economics and potential for being included in less complex, time-sensitive games has been better. However, don't imagine that making even a text-based game accessible to VoiceOver is always as simple as flipping a switch.

There are, sadly, many instances where games that could quite feasibly be made accessible simply aren't. This is due to a lack of awareness on the part of app developers as well as higher up the chain. Platforms like Unity that are used to develop apps don't always make it easy for developers to add accessibility using Apple's built-in tools like VoiceOver. This isn't out of malice. Rather, it is due to a lack of awareness and lack of economic incentive. Blind people make up a very small percent of users of iOS devices, despite how widely they have been adopted by the blind community. This results in developers having to make choices favouring ease of construction over others that might allow for better accessibility but be more costly and difficult to work with. Therefore, you run into games that sound from their descriptions like they should be fully playable. They may be described as text-based games not even requiring typing and yet be utterly useless to blind people. Efforts are underway to change this sort of problem, but change is slow in coming. Economics are a big part of that.

Due to Apple's commitment to accessibility, we've never been in a better position. A lot of potential for different game experiences begs for exploration. Board games that provide audio and tactile feedback are possible. Audio experiences taking advantage of sensors built into iOS devices have been created already. There are many areas of games I believe could be made accessibly on iOS devices that simply haven't been yet. For instance, it should be very possible to make a Mario style platformer game. More complex modern board and card games should also be feasible. It's a matter of skill, resources, economics, and time. Economics are such that independent game developers can create more inclusive games and experiment with new ideas. Awareness of what's happening and polite timely communication are the keys to greater inclusion. This is an area where being an active, informed consumer can really pay off. If you hear about a game you're interested in, find out as much as you can about it. Have an idea how an inaccessible game might be made accessible when you approach its developer. They often don't know where to begin with accessibility. People are still discovering the possibilities of iOS, and there's a willingness to experiment. It's important that we be aware of what we're asking for and that economics can be very tight for smaller

developers. They may not have the money to spend on the time and effort needed to make games accessible.

I've long felt that organizations of and for blind people could be a lot more supportive in this space than they have been. Games are not just frivolous wastes of time and money. They're tools that can teach, unify, and reach people far beyond the classroom. They're also the dominant art form pulling in more revenue than movies and music combined. Innovations like 3D Touch combined with vibration and oral feedback could help make it possible to play board, card, and strategy games. Back in the 1980s, a series of adventure gamebooks called *Fighting Fantasy* won awards for encouraging children to read. Teens who didn't like to read were drawn into the worlds of these books that were as much games as story. Blind people completely missed out on this and many other phenomena, since it would have been very costly to transcribe these books into Braille. The books would have spanned multiple thick volumes even if they didn't include tactile pictures. Finding the correct next paragraph to read would have been somewhat more cumbersome than it was for sighted readers who had all of the text in a single paperback volume. Technology has now reached the point where much of the cost and bulk could be removed entirely. Text-based games combined with iOS devices and affordable Braille displays like the Orbit

Reader 20 could make a tremendous difference for Braille literacy particularly among blind youth. Paragraphs can be linked. Portability is no longer a factor when thousands of full-length books can be carried easily on even a cheap smartphone. For me, Braille was simply never exciting or fun. In hindsight, the advantages of learning and reading Braille seem obvious. However, unless the story was interesting to me, the motivation to practice just wasn't there. In Braille, I read what I was forced to. On the computer and through tapes and CDs in those days, I listened to what I actually wanted to in far more portable forms. Organizations like CNIB, RNIB, AFB and others could support game development economically. They could provide advertising space in their publications so blind people know what's out there. They could also put time and resources into making game developers aware of the potential of the blind audience and of the tools and techniques required to make games accessible when possible.

Before obtaining a game from the app store, do a bit of research to avoid disappointment. Check on the AppleVis site to make certain games that interest you are, in fact, accessible and suitable for your level of skill. Go to www.AppleVis.com. The app directories are full of descriptions and reviews of games that have turned out to be either inaccessible or

accessible. The deck is stacked in favour of accessible games. People tend to want to share positive experiences leading others to them. However, there are thankfully some people brave enough to try apps and report back to the community when they face the disappointment of discovering that an app is inaccessible. Don't presume that just because a game has an entry on AppleVis that it is accessible. Take the time to actually read the entry. Do the homework and you won't spend money on apps you can't use.

Internet Radio and Podcasts: Shared Experience Built with Sound and Passion

While I was growing up, audio entertainment was relegated mainly to the radio. There were audio dramas on CD and cassette tape. However, such things were certainly not part of the everyday experience of ordinary people. There were all too many occasions when I'd expound in the schoolyard about a great audio drama I heard on cassette tape or CD, only to discover that nobody else likely within the city I lived in would even have imagined such a thing existed. You'd think that it had all been written and produced just for me. I didn't find that especially intoxicating to my ego. More than anything else, I found it to be isolating. I had to choose between watching shows on TV that my friends saw while missing a great deal of what happened or listening to things where everything was narrated or illustrated by sound but that nobody else near me would ever hear.

Over this past decade, someone flipped a switch and reminded the sighted world that they actually have ears in their heads as well as eyes. Audio entertainment is no longer a fringe thing. Audio dramas, unabridged audiobooks, podcasts, and Internet radio stations have become big business. People listen while working out, commuting, and even (gasp) while doing

nothing else besides paying attention. Much of what is available is actually free to the consumer. It is supported by advertising.

Your iPhone or iPad plus a Bluetooth speaker or headset can be a tremendously portable gateway to all kinds of stimulating audio entertainment and community. Outside of audiobooks and dramas sold by companies directly to consumers, the only things it may cost you are storage space on your device and the data used to download or stream content. Presuming you are satisfied with what Apple provides on your device, you can potentially tap into Internet radio and podcasts without spending any money at all. For more hardcore enthusiasts, there are a variety of third-party apps that offer additional features to enhance listening and let you tune into countless radio stations and subscribe to podcasts.

The Internet is the wild west of broadcasting and publishing. The costs to produce and stream content are low enough that practically anyone who is interested can participate and publish content. As I write these words, my wife Sara is experimenting with an app called Anchor specifically designed to help individuals produce and distribute podcasts. Enthusiasts can create Internet radio stations broadcasting exclusively via the Internet rather than via radio waves. Most actual radio

stations these days will also allow you to listen via the Internet. This offers the advantage of perfect reception provided your Internet connection is good and you have the necessary bandwidth. Using email and other social media tools such as Facebook and Twitter, people can go beyond merely listening and interact with each other as well as content creators. This opens up tremendous possibilities for helping to make content better, make new friends online who share your interests, and offer any talents or knowledge you might have to help others. Many blind people have decided to become involved in broadcasting on Internet radio stations or in the creation of podcasts. It is now possible to do this content creation using apps on your iOS device.

Podcasts are shows you can subscribe to. As the shows are released, you can stream or download them from the Internet to your iOS device using an app built for this purpose. There are podcasts about any subject you might imagine. This includes everything from audio storytelling and drama, to podcasts about blindness-related information, to podcasts about culture and mythology. The sheer amount of content available in podcast form is breathtaking and usually free for anybody to listen to. Using recording apps and services on the Internet, it's possible to create podcasts using only your iOS device, although accessories

and the right apps can drastically improve sound and overall quality.

In this section, I'll share some of my treasured experiences and discoveries exploring both of these mediums. I'll also cover the facilities Apple has included related to podcasts and radio listening. iOS 13 has introduced major developments, making it possible to use Siri in conjunction with the Music app to tap into Internet radio. They also provide an app called Podcasts that allows you to subscribe to and enjoy countless podcasts available online. This makes it very easy for new users of iOS devices to simply jump in and start listening. However, there are many third-party apps that preceded Apple deciding to up its game in these areas of audio entertainment. These apps offer compelling capabilities to make exploring what's out there and listening even more pleasant. I will discuss my preferred apps for accessing this content and explain why you might want to look at other options when you could do it all free of any costs. Please realize that there is a mind-boggling amount of choice in this space. There are many different podcast apps as well as those for listening to Internet radio on your device. And then, there's enough actual content to consume multiple lifetimes. Even with nothing else to do, there would be no way that I could keep up with all the

podcasts and Internet radio shows that cater to my particular interests. All of the apps I'll present in this section have facilities to help you seek out content and learn about what's currently available.

The station and podcast examples I'll use when describing how to use various apps have been chosen to maximize the benefits of taking the time to listen even before you know how to interact. At the end of the portion of this section devoted to Internet radio, you'll find a list of stations that are either my favourites to listen to or are stations particularly helpful to blind people. Similarly, you'll find a list of podcasts awaiting you at the end of the part of this section devoted to them. If nothing else, I hope this gives newcomers a good place to start. Things do change over time. Podcasts come and go. Also, some content is Geoblocked and may not be available in your area for that reason. Typically, this has to do with copyright and marketing restrictions. While there's no charge to listeners for this content, money is certainly needed to produce it. I live in Canada, so the resources I feature here will reflect this. As far as I know, they should be available in most places. A great many originate outside of Canada. That being said, lets dive right in.

Internet Radio: A Social Sonic Springboard for Community

The day had finally arrived. It was April 27, 2012, when I found an email awaiting me. The time had come for the Mushroom FM Weekend Virtual Birthday Cruise. It was by far their biggest, most intricate celebration event ever staged at the time. For long-time listeners like me, it was very much a cause for anticipation and excitement. I made certain my weekend was clear of any other plans, wanting to catch as much of this as possible.

There was, of course, no need to pack for this "weekend away". The event took place online and in the cheerful minds of its participants who were in many countries around the world. The good ship Fungus was an imaginary construct reinforced by the willing suspension of disbelief, aided by well-crafted sound effects. Our cabins were identity numbers allowing for easy tallying of correct trivia answers, votes cast, etc. The virtual rooms were hosted by the station show hosts and staff to the delight of all involved. Sitting comfortably at home or wherever we happened to be, we could, nonetheless, participate in this fifty-five hour continuous audio party.

Only a year into my iPhone experience, I took part mainly through my desktop computer. The speakers filled my apartment with the proceedings of the virtual cruise. Well-picked music

was interspersed with interludes complete with atmospheric shipboard background sound effects where the current host would update everyone on contests, ask participation and trivia questions, conduct polls, etc. Anybody at all could tune in and listen. However, registration prior to the event meant that you had a cabin onboard and could partake in the more interactive elements of the experience including contests and votes. This was done via social media including Twitter, Facebook, and via email. Hashtags were used on Twitter, which was where people had ongoing conversations and participated with the hosts most frequently. This event served to powerfully demonstrate the potential of the Internet to bring people together. I still converse with friends I made on Twitter during that weekend of extended broadcasting. Many people who normally only interacted with others who listened to the same shows were exposed to different hosts and audience members they may not have otherwise encountered. The result was a stronger community of listeners and lasting online friendships.

Marathon Events like the virtual cruise I described above are relatively rare. They require a lot of dedicated effort to pull off. For event creators and hosts, the more game or interactive elements there are in an event, the more effort and skill are needed to bring them off satisfactorily. My wife Sara

has become deeply involved in Mushroom FM. She hosts two regular shows, including one that happens every weekday. During the final weekend before I published this guide, April 25th and 26th of 2020, Mushroom FM celebrated its 10th birthday. The main event of these celebrations was Mushroomstock 2020. Modeled after the legendary Woodstock festival, this twelve-hour event featured live recordings made by groups who had already passed on or else couldn't reunite and play together. I got a peek behind the scenes, or ... sounds in this case, as Sara prepared for her three-hour slot where she would host proceedings. A lot of work goes into fine-tuning the crowd noise used during portions between the music when you hear from the various show hosts and broadcasters involved. There's all of the work selecting acts comprised of live recordings possibly performed at different events and making it all sound like it fits naturally into the same event held at a completely fictitious Fungus Field. Where else would Mushroom FM hold a music festival?

For audience members participating in such events, the bar is much lower. Of course, they need whatever skills that doing well in a particular event demands. Also, they need to be familiar enough with whatever social media platform is being used to facilitate interaction to use it quickly. Some events are conducted with Skype or other group-conferencing platforms,

letting participants simply talk to the hosts and/or each other. Other times typed communication is expected via email or Twitter. This lets creators have more control over what gets broadcast. It can also allow for more easy private conversation to occur off air between audience members tuned into the broadcast.

For many blind and visually impaired people, social isolation can be a major issue. finding people with similar interests and experiences can be tricky. One approach to hooking up with others is through Internet radio stations. Nothing can replace spending time with people who are physically present. However, many meaningful and worthwhile relationships have grown out of participation with communities of listeners that form around shows and stations accessible freely online. Neither transportation nor a lack of funds will stop you from participating and contributing meaningfully to the communities that grow around stations and shows. All you need is your iOS device, an Internet connection, and your preferred accessories for listening and/or typing. If you're unfamiliar with social media, please see the section in this guide titled A Truly Global Village. If you aren't quite feeling ready to plunge into that just yet, fear not. Most Internet radio stations will have email addresses that you can use to give feedback at a minimum.

Many broadcasters will even check emails while a show is happening and read them to listeners along with activity from social media platforms. Interaction is a major reason for them to produce broadcasts. They are usually keen to offer assistance and encouragement to newcomers.

Apple's Approach to Internet Radio Enjoyment

If you've read the section about the Apple Music app, you'll know that Apple steers you towards its own curated group of radio stations. Their flagship station is called Beats 1. On that station, you'll find a lineup of live and prerecorded shows hosted by professional DJs as well as big names in the music industry including Elton John. Apple also taps into an expert staff plus artificial intelligence to provide a large selection of curated stations. These can all be found and explored in the Radio tab of the Music app. At present in early 2020, scrolling around the contents of tabs in the Music app isn't as easy as it should be, thanks to current issues with VoiceOver focus and stability. I've found that VoiceOver keeps being unable to move to headings lower down in the tab. Also, it keeps jumping back up to the top page when I attempt to explore subsequent pages of a tab. This blocks me from reaching the majority of what is quite an extensive tab devoted to Internet radio. As VoiceOver issues are addressed, I expect this problem to disappear

relatively quickly. Hopefully, it will have vanished by the time this guide reaches you. If not, just know that the struggle you're having isn't a lack of proficiency on your part.

Presuming you are able to explore and use that tab normally, you will find headings such as Recently Played, Apple Music Radio, Radio by Genre, and many more. Once at a heading, flick right to go through options beneath it. Often, I've found that going to the next heading and then flicking left reveals more options beneath the prior heading that were skipped over during forward travel. The only way I can currently get at lower headings in the tab is through the use of the vertical scrollbar on the right side of the screen. It isn't always easy to find. However, once you have, flick down to jump further down the tab and then flick left onto the tab's contents at that level.

A lot of that tab is taken up by information and shows broadcast on Beats 1 and available for streaming after their initial broadcast. Simply double tap on a show to reach its show page. There, you can read a bit about the show and double tap on an episode to start listening. Apple throws substantial resources into this content. Finding other content such as third-party terrestrial stations broadcasting music or news can be somewhat tricky. There is a heading called Broadcast Radio.

Also, there are genres like News and Talk that can offer a limited set of stations.

Once you start a station or show playing, the standard playback screen pops up. With prerecorded shows, you can move around as normal. However, you can't skip things during live shows. Simply use the Dismiss button to go back to the Radio tab and hide the playback screen.

The Radio tab is only one of two ways Apple has provided to bring endless wonderful radio to your ears. The other is to simply look for stations through other means such as Google, and then simply tell Siri what you want to hear. One advantage of this is that you don't even have to leave the app you're in to start something playing or change what you're hearing to something else. Another big plus is that Siri can tap into many different directories of radio station streams to find what you're hoping to hear. It then simply starts playing the station in the Music app. Wait around five to ten seconds after this happens and the Siri dialogue window will close, leaving you wherever you were before invoking Siri. You can always use the home screen gesture or Home button depending on your model of iOS device to escape this window more quickly.

For our first example, let's say you want to hear what's currently playing on AMI Audio. This audio stream is broadcast

on Canadian television. This makes it easier for those unconnected to the Internet to tune in and be informed and entertained. You can learn more about the shows and content you'll hear by going to www.ami.ca.

To access this stream using Siri, you first need to invoke Siri by saying "hey Siri" if you've enabled this, or by holding down the Action button on your device until you hear a short beep. Once you've heard the beep, simply say "play AMI Audio". If Siri doesn't recognize your request properly, try saying the letters separately like you'd do with an acronym like CIA. Siri will then emit a short beep to indicate that it has stopped listening and parsed your request. If all went well, you should then start hearing whatever happens to be on AMI Audio at the moment.

Once you've played a station in this manner, that station is recorded in the Music app under the Recently Played heading found in both the For You and the Radio tabs. This makes it easy to tune in again by double tapping on any stations beneath that heading. This is useful when you don't wish to disturb anyone around you by speaking to Siri. The more stations you listen to, the more is added beneath that heading. Eventually, if you don't listen to a given station, it gets pushed down farther beneath the heading and may eventually no longer be there at all.

Advantages of Third-Party Listening Apps

Not everyone is satisfied with Apple's approach to Internet radio. Station exploration beyond Apple's curated set of choices is harder to do. many people won't see this as a problem, since they can just ask Siri to play whatever station they want to hear. However, actually finding out about what else is out there waiting for your discovery can't really be done with the Music app. You could certainly use Google or word of mouth to find out about new stations. However, you then need to hear these stations to get them recorded as Recently Played, or keep your own list perhaps in a Notes app. Also, people may want to keep a stable list of their favourites that doesn't change based on how often they listen to things. They might want to search for stations within a specific city they're visiting so they can get a feel for what the locals are hearing. Third-party apps designed for Internet radio listening offer this kind of benefit and others to increase your enjoyment. Many of these are free to download but are supported by ads. Others are sold as subscription services to access all of their features. Other apps charge a one time fee up front that entitles you to all future updates. Let's look at a few of these apps that are accessible and have been kept up to date as iOS has changed. We'll start with a long-time favourite of mine.

ooTunes

This app costs around \$13 Canadian in the app store. However, it's a one-time fee. ooTunes offers a well-maintained directory of both terrestrial and Internet-only radio stations. Updates to this app are infrequent. However, it has remained functional and very accessible to VoiceOver users throughout most of its long life.

The major strength of this app is its easily searchable directory. Another thing I particularly like is the ability to edit and reorder your list of favourite stations. Once you're in this favourites list and playing a station, you can easily change to other stations using your headset controls or multimedia keys on a keyboard. This makes it easy to move between favourite stations while working in another app.

Let's take the different stations offered by the American Council of the Blind (ACB) as an ideal example for the ooTunes app with its excellent search capabilities. Once in the OoTunes app, you'll find a relatively simple home screen. No tabs are used in this app. At the top left, you'll find a Help and Suggestions button. Should you want more in-depth instructions about the features of this app, you should double tap this button and explore. Flicking right, you'll pass over a Home heading as well as a Now Playing button. This button will reveal

a set of playback controls much like you'd find in the Music app once you maximize the mini player. The next button over is called Stations. Double tap this and you'll reveal two more buttons. These are Search Stations and Browse Stations. The names are pretty self-explanatory. If you double tap on Search Stations, you can make use of the search field as well as many options found to the left of that field used for filtering or sorting your search results. For Internet radio stations like ACB Radio, you should just type in the name or even a partial name into the field. In this case, type "ACB". Once you do that and double tap the Search button at the bottom right, the results will appear. Flick right through any results and double tap the one you want. For example, ACB Radio Mainstream. This will start the station playing, provided there's no trouble with the stream. You will also find that the playback window has popped up. Inside it, you'll find controls including a Mark Stream as Favorite or Add to Group option. Double tap this to add a currently playing station to your list of favourites. If it's already there, the same option will remove a station from your list.

The TuneIn Radio App

Another very popular app is TuneIn Radio. This app can be used to listen to stations for free. One can also keep a list of

favourite stations. When used in free mode, listeners will hear advertising that is above and beyond that normally heard on the stations themselves. These ads are inserted by TuneIn Radio, and revenue from them helps maintain the app and extensive station directory. This directory is also used by many other services such as Google, Siri, and Amazon, allowing them to play radio stations found in the TuneIn directory.

If listeners want to ditch the ads that clutter the screen of the app as well as one's ears, they can pay for a subscription. This will remove the ads and offer other benefits. These include tuning into sports broadcasts, reading a selection of audiobooks, and more. The app is well laid out and presents no known difficulties to blind people when it comes to accessibility.

For people in the UK, the RNIB offers many services. One of these is a radio station available online. To listen to RNIB Connect Radio, launch the TuneIn Radio app. Next, double tap on the Search button found near the bottom right of the home screen. You'll then find a search field where you can enter "RNIB". In addition to the station itself, RNIB makes the shows available as podcasts. TuneIn Radio can be used to subscribe to and hear podcasts if desired. However, there's a heading in the results called Stations. Underneath that heading, you'll find

the RNIB Connect station. Rather than feeling beneath a heading, you can simply flick right past the heading and onto the contents underneath. Double tap on the RNIB Connect station and it will begin playing. You can add it to your favourites if you wish.

The Triode Internet Radio App

Recently, a new app for listening to Internet radio has emerged. Called Triode, it was created by the Icon Factory. These independent app developers have demonstrated their commitment to making their apps accessible to blind people. They are most widely known for the Twitterrific app. This app can be downloaded and tried out for free. However, a subscription is needed to unlock all of its features. Alternatively, you can pay a one-time fee of around \$27 Canadian. This helps to support the continued development and maintenance of the app.

The interface for this app is somewhat more traditional than ooTunes and makes use of tabs. Things are nicely laid out and easy to explore. So far, the directory of stations has contained everything I've thought to search for. As with ooTunes, you can maintain a list of favourites and switch between them using the multimedia buttons on your headset or keyboard. The app is very polished and definitely worth checking out.

We'll use Mushroom FM as your example here. This station is a kind of shared hobby for its famous owner Jonathan Mosen. It's a way to give back to the blind community. He has a number of people who help out with broadcasting their own shows. Also, he has his own popular show every Saturday afternoon from two to five PM called the Mosen Explosion. He pays much of the cost of running the station, and community members help out when needed. To tune into this station:

First, double tap on the Triode app to get it running. Next, feel across the bottom of the screen until you find a Find a Station tab. Double tap this. Once you're in this tab, feel near the top of the screen to find a search field. Double tap this and enter "Mushroom FM" in the field. Even if you just enter "Mushroom", you should find it among the search results. Flick right through the results and then double tap on the one you want to hear. It should start playing. Be certain to examine the playing screen that pops up and add Mushroom FM to your favourites. You can learn more and check out the schedule to find shows that interest you by visiting www.mushroomfm.com.

Further Notes on Listening to Internet Radio

When tuning in via the Internet, keep in mind that there are times when technical issues will make stations unavailable from time to time. Don't give up on a station just because it

doesn't happen to connect. It may just be down temporarily. The fault could be with the Internet generally or with the specific carrier or server that hosts the station you're wanting to hear. Also, these are typically small operations. The broadcasters or owners may be experiencing difficulties.

The list of favourite stations below doesn't even begin to scratch the surface of what's available. Traditional broadcasters, large corporations, and all kinds of enthusiasts make a staggeringly broad range of stations available. These can be heard using the apps covered above or simply through your Internet browser of choice. Most of these stations have their own websites where you can learn more about them. For instance, you can find their broadcast schedules and what shows are available. Also, you will usually be able to find out about the broadcasters and other people behind the station. Most of them are run by people with their own agendas and interests. They are happy to be contacted by their listeners and will respond to inquiries or comments.

CBC Listen

Another excellent thing to look into is whether your local public radio service has produced apps that help you explore their offerings. For Canadians, the CBC (Canadian Broadcasting Corporation) has produced a wonderfully accessible app called

CBC Listen. This app lets you tune into their live radio stations from across the country. Also, it has separate tabs for exploring a range of music playlists and a growing number of podcasts. You can also hear your favourite radio shows on demand if you happen to miss them. It's a very well-built app, and they've put in the effort to make certain that users of VoiceOver have an easy and enjoyable time.

BBC Sounds

Over in Britain, the BBC has made a similar app called BBC Sounds. They are world-famous for audio drama production as well as wonderful comedy, among a great deal else. They also deeply care about their blind audience. Any apps they produce will be accessible to VoiceOver.

NPR One

In the US, the NPR (National Public Radio), is the closest equivalent to our CBC. They have also produced an app to help people enjoy their audio offerings that include some wonderful podcasts. You can find the NPR One app in the app store.

CP24

If you enjoy any other terrestrial radio stations that you hear locally or while travelling elsewhere, use Siri or one of the apps discussed above to search for it. You may find that it's available as an online broadcast. I was thrilled to

discover that a favourite local news source, CP24, was available as an audio stream online. I used to tune in regularly while I had a TV, and it was one of a very few channels I've ever actually missed since I stopped watching TV. Having the audio available through Siri or the Triode app among others was a very pleasant surprise.

RadioPlayer Canada

The RadioPlayer Canada app has a directory of over four hundred radio stations, which are part of a collective group that sponsored the development of this app. AMI Audio can be heard on it as well as on other Internet radio apps.

Favourite Internet Radio Stations

Here are some other wonderful Internet radio stations you might enjoy listening to. These are not in any particular order. I've certainly appreciated them over the years and hope to continue finding more stations. Keep exploring for yourself and share what you discover with others.

Team FM

www.team-fm.com

This station is run by blind music enthusiasts who want to put a positive spin on things. They share their knowledge in-between endless good music from all eras. It's all about creating a positive, cheerful community for these folks.

Radio Rivendell

www.radiorivendell.com

If you've ever wished that your life had an epic soundtrack to go along with it, this is the station for you. It plays a constant stream of instrumental music from movies and video games. It leans heavily in the fantasy adventure direction. A lot of the music is from video game and movie scores, and they also feature independent instrumental composers. I've rarely disliked more than one song in a row that they've played. This station makes for a great background while writing or playing a tabletop RPG with your friends.

Cornucopia Radio

www.cornucopia-radio.co.uk

Based in England, this group goes to different local venues to record audio dramas. They employ local talent and also make use of voice actors from all over the world. The range of material streamed on this station is tremendous. It's all fun and mostly quirky.

Mushroom FM and Mushroom Escape

www.mushroomfm.com

I've already discussed Mushroom FM above. However, it's so awesome that it deserves another mention. There's no better place for that than right here where I also tell you about its

companion station Mushroom Escape. This station brings you a steady stream of classic and modern audio drama and comedy. Run by enthusiasts who deeply care about audio entertainment, you'll find lots to laugh at and think about whenever you need an escape.

Podcasts: Fascinating and Portable Stimulation

I've enjoyed podcasts for years now, just about as long as I've enjoyed Internet radio. However, while I can clearly remember the first Internet radio station I ever listened to, I can't say the same for podcasts. I strongly suspect that it would have been the Main Menu show, which was made into a podcast that I first heard on ACB Radio. This show and podcast is still being produced today, well over ten years after I first came across it.

Unlike radio stations, podcasts aren't heard live. They are audio files of complete episodes or shows published on RSS feeds online. They're great for when you don't really want to dig into a book or can't afford to. If I'm going on a trip or might be offline for a while, I'll be certain to download a bunch so I have lots to listen to. I've often been surprised at just how much excellent listening gets put out there and completely escapes mainstream notice.

There's no regulation when it comes to podcasts. Absolutely anything goes. Ordinary people can just decide to record podcasts on their computer or smartphone and stick them out there through a podcast hosting company. Some popular podcasts are sponsored or produced by companies as advertising vehicles. It's a very diverse and wide world to explore. Gifted amateurs often end up building massive loyal audiences just as large or larger than corporate-produced efforts. Word about excellent listening does seem to spread.

To listen to podcasts, you need a podcast player. Apple has provided you with one that is included in iOS. We will cover it in detail along with related settings found in the Settings app. There are many good alternatives in the app store. We'll look at three of these as well.

You'll notice my list of podcasts at the end of this section is much larger than that of Internet radio stations. The main reason for this is that you don't need to find a whole lot of stations to have more than enough interesting content. Podcasts are far easier to fit into life and good ones really tend to stick in the brain. Even so, I subscribe to more podcasts than I could ever hope to keep up with. this way, there's always a choice of interesting podcasts waiting for me.

To get started, let's take a look at the Podcasts app that is included with iOS and already on your device.

The Podcasts App

This is a free app made by Apple. Chances are that it's already present on your device. If not, you can simply download it from the app store. There are no ads or in-app purchases to worry about. It's a very bare bones app uncluttered by extra bells and whistles. The layout and controls are very simple. If you're still learning VoiceOver and starting from scratch in your exploration of podcasts, you will likely find that this free app more than meets your needs. It's a great one for beginners to practice on while they learn VoiceOver.

The introduction of iOS 11 set a new direction in design when it comes to digital media. Following in the footsteps of the Music app, the app store and Podcasts app are all now very similar in layout and operation. This makes for good consistency, which can really be helpful for beginners. Presuming they can master the app store or Apple Music, the new design is so similar that they shouldn't have any problems mastering the Podcasts app.

There are four tabs across the bottom of the Podcasts app. The tabs are Listen Now at the far left, Library, Browse, and Search on the far right. The two on the left are for listening,

while the two on the right are for discovering new podcasts. So far, so simple. Let's take a closer look at these tabs in order.

Listen Now

This first tab contains the podcast episodes that you have most recently listened to. There are two headings. At the top, there is the Up Next heading. This prioritizes episodes that are unfinished. It will play these in order to help get you caught up with what has been added to the queue.

The Recently Played heading has the most recent podcast episodes starting from the most recent and working backwards in chronological order. Rather than going by episode number, it has episodes in order by day and time published. This way, it's very easy to get a sense of how recently episodes have been published in all of the podcasts you've most recently heard.

At the top of this tab, you'll also find a Notification Settings button. Each podcast you have subscribed to will get its own toggle switch. When this is set to "on", you will receive a notification whenever a new episode is detected. The default position of this switch is on.

Library

The Library tab is more complex. You can view by show or episode, look at only things that are downloaded to your iOS device, remove shows or episodes, etc. A lot of that is accessed

via the Edit button near the top of the screen. Next to that are Show and Episode buttons so you can choose which you want to focus on. Next, you'll find a handy heading labelled Recently Updated. Shows or episodes are normally in chronological order. Double tap on a show or episode to select it just like in the Listen Now tab. Once you're down to the episode level and double tap on the episode you want to hear, flick right and you'll find Play and Download buttons as well as a full description and show notes. You're never stuck anywhere. A Back button is always at the top left if you're inside a show or episode. Remember to press the Play button to start an episode playing.

Browse

The Browse tab is very much like the one in the Music app. You'll find a series of buttons. There's a Browse heading at the top of the screen, but that's the only one. Flick left and right through the various buttons and double tap on what interests you. The first buttons are new or popular shows. You then find buttons for various curated collections. There's a Featured button, a Top Chart button, an All Categories button, and at the bottom right, a Featured Providers button. These let you have a good look around to see what's available from the best known podcast providers. Remember that no matter how far you drill down into a category, there's always a Back button.

Search

This tab is typical of ones bearing its name. You can choose to search all podcasts or just the ones in your library. Other than that, there's simply an edit field to type in your search terms. To the right of this is a list of current popular searches.

Listening to Podcasts

During playback of an episode, you can have the app in the background while doing other things just like with the Music app. In fact, things are kept precisely similar. A player screen will pop up hiding the four tabs. The episode will start playing, and you'll find a Dismiss Player button at the top left. There are play controls including buttons to skip forward or backward by fifteen seconds, share what you're listening to, change the playback destination to connected devices, etc.

Podcasts App Settings

You'll find a selection of options in the Settings app that let you configure the Podcasts app in important ways. As with other apps, you can specify how notifications from this app will appear. As there may very well be many new episode notifications, it's important to be able to control this separate from other apps. You can also choose whether the Podcasts app can refresh in the background, checking for new

episodes while you go about your day. You can also choose whether or not the app can use cellular data. If you're on a limited data plan, this is a very good ability to have.

If you have more than one iOS device, you can choose to have podcasts synced across any devices connected to iCloud. You could start playing on one device and switch to another such as a HomePod speaker. Another setting lets you block downloads over cellular data. This way, you can use a miniscule amount of data checking for new episodes but not have to worry about them downloading until you're on WiFi.

The Continuous Playback option lets you select whether episodes in the Up Next queue will play automatically one after another. This can be great for long drives or stretches where you just want interesting things to hear with a minimum of fuss.

A heading called Episode Downloads precedes these next options, which allows you to take further control of what gets downloaded when. The first option under this heading lets you specify how often new episodes are checked for. The default setting is every hour. Remember that you don't have to download podcasts to play them. You can simply stream them provided you're connected to WiFi or have cellular data. If you want to stream episodes and not have them take up space on your device, simply set the Downloads toggle to "off".

Once episodes have downloaded to your device, it's important to manage that content and clear out old episodes. You don't have a whole lot of control here. There's a single switch that provides an option to delete downloaded episodes twenty-four hours after they're played. All other management will need to be done from the library.

Another group of settings lets you change how skip buttons work. These let you skip chunks of an episode you're hearing or skip to other episodes while listening. There are options for skip buttons in the app itself, as well as for how other remote controls such as on a headset or in a car system will behave.

The last setting has to do with information privacy. To help providers of podcasts and Apple improve what you hear, data is collected as you use the Podcasts app. There's a nice explanation of this that can be reached by double tapping the Privacy button. Next to this button is a setting that lets you reset your unique identifier number. This number isn't connected to your Apple ID and is only used to identify the data as being from a single user.

Overcast

This app is very popular and offers more advanced features than the Podcasts app from Apple. One of the features that sets this app apart is called "voice boost". It alters the sound of

podcasts in a manner that makes spoken dialogue easier to hear. This could prove especially helpful for those with hearing difficulties or while you're in noisy environments but still need to understand what is said.

Overcast is free from the app store but is ad supported. A premium subscription can be paid for that gives additional features and keeps the ads away. Even without paying for this, Overcast is an excellent podcast player. Just be familiar enough with navigating around using VoiceOver so the ads don't trip you up. It's not rocket science, and you get a far more flexible and powerful podcast player for your troubles. Overcast is updated frequently and kept in good working order.

The design of Overcast will be especially appreciated by people who don't favour having everything in separate tabs. It's all in one place. Set the VoiceOver rotor to headings and quickly navigate between playlists, podcasts with fresh content, and older material already heard. Note the Settings button at the top left of the main screen. This app offers a wide array of useful settings that you should explore and change to suit your particular style and circumstances.

To subscribe to a podcast using the Overcast app, do the following:

1. From the Settings button, flick right three times and you will reach the Add Podcasts button. Alternatively, presuming your rotor is set to headings, flick down to the Playlists heading and then flick left once to reach the Add Podcasts button. Double tap this button.
2. From the top left, flick right until you come to an edit field labelled Search Directory. Double tap on this edit field and then type in what you want to search for. Example: "Kelly and Company". Double tap the Search button that appears on the bottom right to perform your search.
3. You will then be taken to a list of results your search term has found. Flick left or right to navigate this list, and double tap the show you want. This takes you into a show entry page. Flick right to find the Subscribe button and double tap this. You will now be subscribed to the show.
4. Make your way back by using the Back button found at the top left of the screen and when possible, the Cancel button to move out of your search and back to the rest of the app.

Once you've subscribed to some podcasts, you'll want to play them. To do this:

1. If you want to hear the latest episodes, flick right until you get to the All Episodes playlist. This is the first playlist under the Playlists heading and is easy to find even without using the rotor. Double tap on All Episodes. Should you wish to hear older played episodes, Flick down to the Podcasts heading and flick right until you come to the podcast you want. Double tap on this and then flick right to scroll through episodes.
2. You can then navigate the list of episodes by flicking right or left using a finger. Double tap on the episode you want to hear, and you will be presented with a range of options. The second option is the Play button. Double tap this and the episode will begin playing.
3. During playback, a special screen will appear with controls to help you enjoy and/or share what you're listening to. This includes a button for the "voice boost" feature as well as other facilities like a sleep timer.
4. When done listening, double tap the Back button in the top left corner. This returns you to the playlist or list of episodes you were in. This won't stop playback. You can explore, subscribe to podcasts, and do other things while still listening to an episode. Double tapping anywhere on the screen with two fingers allows easy pausing and resuming of playback even while in other apps.

Downcast

Until early 2020, Downcast was my absolute favourite podcast app. It costs \$3.99 in the app store. You get everything for that low one-time fee. It is possible to make use of a tip jar in the app to voluntarily pay the developer, which

encourages further development of the app. No ads to worry about. A very rich set of features including the ability to import podcast lists. Look in the More tab, and you'll find settings, tools, all sorts of help, and other options. You can import audio or video files and have them treated like a podcast. This can work well for audiobooks in MP3 format and other audio files. Go to the Add tab to search for and add podcasts. For the most part, I find things are explained quite well in context. Learning what options are available is straightforward.

This app is a highly regarded podcast app fully accessible with VoiceOver that can be purchased from the app store. Downcast has remained a popular podcast app due to its robust set of features and avoidance of being supported by ads. Look in the More tab at the bottom right corner of the screen. That tab contains settings and tools to enhance your enjoyment of podcasts. Take the time to explore.

To subscribe to podcasts, do the following:

1. There are five tabs across the bottom of the screen. The Add tab is in the centre of the row. Double tap on it.
2. From the top left, flick right until you reach the Search for Podcasts button. It is immediately to the right of the Add Podcasts Manually button and above the Top Podcasts heading. Double tap the Search for Podcast button.
3. You will be placed in an edit field found at the top left of the screen. Type in the name of a show you want to subscribe to. For instance, "AMI Audio Live". Find the Search button that appears in the bottom right corner.

4. You will then be placed in a list of results found by your search. Flick left or right to navigate these results. Double tap on the show you want.

5. This takes you to the show entry page. Near the top left of the screen right after the show name, you'll find a Subscribe button. Double tap this to subscribe to the podcast. Once this has been done, double tap the Back button found at the top left corner to move back out of the show entry and search results. This reveals the other tabs in the app, allowing you to subscribe to another show using the steps above or go to your list of subscribed podcasts.

Once you've added one or more podcasts, playing them is easy.

1. Upon first opening the app, you will be in the Podcasts tab. If you're elsewhere, the tab can be found at the bottom left corner of the screen. Double tap this tab.

2. Note the Refresh button at the top left. Use it to make certain you have the latest episodes ready to stream or download.

3. Flick right through the list, which starts with podcasts containing unplayed episodes at the top. Flick left or right to navigate the list, and double tap on the podcast you want to hear.

4. You will now be in the list of available episodes starting with the most recent. Flick left or right to navigate this list, and double tap on the episode you want to hear. It will begin playing.

5. During playback, you will be in a screen containing controls to help you enjoy the podcast. Flick left or right to go through options, double tapping on what you want to do. The Back button at the top left will return you to the list of episodes.

The Castro App

I found out about this wonder of a podcast player through listening to Internet radio. The Mosen Explosion show on Mushroom FM to be precise. On that show, Jonathan Mosen described how happy he was with this Castro app and what a difference it had made to his podcast listening. On his recommendation, I decided to give it a try. Until then, I was perfectly happy with Downcast and had doubts whether anybody would ever outdo that app.

Castro is designed for busy people who, like me, want to subscribe to more podcasts than they have time to listen to. The app has three levels of organization. Each has its own separate tab. There are four tabs positioned slightly above a strip of play controls across the bottom of the screen. These are Queue, New, Library, and Discover.

The Queue tab is where the episodes you want to hear next are placed. It's the tab you start out in when you open the app. You can start playing a podcast episode in the queue and sit back while subsequent episodes are played in the order they appear in the queue. You are able to rearrange episodes in the queue, clear episodes from the queue, or start an episode playing out of sequence whenever you wish. You may also add more episodes to the queue at its beginning so they're up next, or at the end so they're last in line. You can have episodes in the queue automatically downloaded to your device. Even better, settings within the app let you determine how many episodes or how many hours worth of material from the queue are downloaded to your device. This helps tremendously when you want to make certain you have fresh episodes but don't want to micromanage exactly which ones get downloaded.

The New tab is like your email inbox. New episodes appear in chronological order from all of the podcasts you subscribe

to. They aren't downloaded or added to the queue unless you make this happen. You can flick through episodes in the New tab and only add the episodes you wish to hear to the queue. Simply clear any you aren't interested in from the New tab and await the next hopefully more interesting episode from that podcast.

The Library tab is where you'll find all of the podcasts you currently subscribe to. You manage subscriptions here, removing any that you no longer want or changing the settings for each podcast to determine how new episodes are dealt with. Also, this is where you can explore and listen to older episodes you didn't have time to catch earlier or simply weren't interested in when they first appeared.

Finally, the Discover tab is where you look for new podcasts to listen to. As with most podcast apps, you are able to browse popular podcast categories for new content or search via the search field for podcasts you know the titles, producers, people, or key words for. There's plenty of facilities for exploration.

Once you're playing an episode, there are alternative views to choose from. You can look at the show notes if they're available. Also, you can see podcast art or simply an expanded set of playback controls. There are some advanced options like speed control, silence removal, and enhanced voice option that

clarifies any spoken words in the podcast. This is similar to the voice boost feature found in Overcast.

Castro is supported by subscription. This unlocks some advanced features such as being able to sideload or import audio or video content. This is especially useful for YouTube videos, turning them into podcasts that are uninterrupted by those pesky ads. This is fabulous for listening to longer videos like game playthroughs at your own pace and being able to easily jump around in them. You could also sideload audiobooks in MP3 format or other files for playing at your convenience. Even if you don't plan to subscribe, anybody who appreciates podcasts should check this app out.

Further Thoughts on Podcasts and Podcast Apps

Audio entertainment is experiencing something of a revival these days. Podcasts were once a fringe hobby for geeks. Now, they're part of everyday conversation and listened to by all kinds of people. Radio shows often make their episodes available as podcasts so people can listen wherever and whenever they wish. They're a wonderful tool for education. Many podcasts are put out by blindness organizations as a way of sharing news and knowledge. The Canadian National Institute for the Blind, (CNIB), produces several podcasts. I'll put a number of such blindness-related podcasts in the Podcasts to Start With list

found below. I hope people find these as helpful as I have over the years.

The apps discussed above are fully accessible to VoiceOver users. There are many more options out there in the app store. Nothing says you can't have more than one podcast player. Just keep in mind that each of them might download any podcasts you subscribed to unless you change the settings for the app so that it doesn't download anything automatically. I use Castro for my podcast listening needs and have set things so a certain amount of podcast episodes most likely to interest me are added to the queue and downloaded automatically. Find the app and style of managing content that best suits you. Each podcast player will have its own approach to things like displaying new podcasts, managing downloads, etc.

All podcast player apps will have facilities for finding podcasts. In Downcast, go into the Add tab. There, you'll find the ability to search for a podcast you might know the name of. You will also find directories of popular podcasts that you can browse and then subscribe to any podcasts that interest you. Once you do that, you will be informed of any new episodes of that podcast. The apps will typically default to the behaviour of downloading the new episodes automatically. If you subscribe to a lot of podcasts, this isn't such a good thing, as your

device's storage could be completely filled with episodes. Most podcast players have settings to automatically delete older episodes so your device doesn't get filled to the brim.

There's so much good audio made available in podcast form that it boggles the brain. I'll never run out of new ones to try. Much like beer in that regard. There are only so many hours to listen in a day, though. I subscribe to well over two hundred podcasts and will comb through new episodes when I want something interesting to hear. Other people simply subscribe to a low enough number of podcasts that they can listen to in order or make playlists to hear and keep up with them all. They're all free for the taking.

Podcasts to Start With

Many organizations produce podcasts. In particular, if you enter "CNIB", "RNIB", "Accessible Media", "CCB", "CBC", "NPR", or "BBC" in your podcast player's search box, you'll find a wide range of podcasts. These range from podcasts about reading, technology, useful blindness information, and much, much more. I wish you the best of success in your search for great podcasts to listen to.

To help you get started, I've listed some podcasts below that I think offer substantially good entertainment or else are beneficial to hear. Just type the name of the podcast into the

search field of your podcast app of choice and you should be able to subscribe and tune in. I've written a brief paragraph about each podcast. Other than being certain to include a wide range of podcasts, these are in no particular order. They've all simply proved to be very useful, enjoyable, or fascinating to me. I hope you find at least some of them to be worth your time. This is just the tip of the iceberg but will hopefully give people a good starting place. As new episodes get released, your podcast player can keep you informed. Take the time to learn options and settings available in the app you've chosen. The time spent pays off as your listening priorities and circumstances change. Some great podcasts to start with are:

Podcast Playlist

Each episode features a number of different podcasts connected by a common theme. The hosts of that show have introduced me to many new favourites. The show itself is also a podcast. Check out a few episodes and get a better idea of what's out there for your listening pleasure. It can be found on CBC Radio or online at www.cbc.ca/podcastplaylist.

Spark

This CBC radio show, like many others, is also available in podcast form. Spark discusses technology and how it affects society. It has been on air for around a decade and has

maintained a very high standard of quality. If you want to understand technology and how it might impact your life, tune into this one.

Tapestry

This show is another long-time presence on CBC Radio. It looks at how spirituality and faith intersect with modern day life. All kinds of thoughtful and informative authors, experts, believers, and skeptics are interviewed. A very thought-provoking addition to anybody's podcast collection.

Now or Never

This is a wonderfully fun, hopeful, and inspiring show on CBC Radio that looks at people seeking to change their circumstances, habits, or character in a meaningful way. Hosts Ify Chiwetelu and Trevor Dineen interview people and often join them during critical moments as they move out of their comfort zones. I've consistently found this to be excellent and uplifting fun.

Ask Me Another

This podcast is a show from NPR. Host Ophira Eisenberg and musician Jonathan Coulton engage their guests and listeners in all sorts of amusing puzzles, brain teasers, and trivia. They also manage to throw in some fascinating interviews and

conversations. Guests have included all manner of famous actors and others.

Snap Judgement

Glynn Washington and crew provide thematically linked interesting stories both real and fictional. They've kept the podcast going for around seven years, and there are hundreds of hours of well-produced and curated stories. They have some great special episodes including "spook" specials around Halloween and other holiday specials. Shows have a theme that links the stories they contain.

The Overnightscape

A favourite of mine, you just never know what Frank will get into. Frank Edward Nora records his thoughts on all sorts of pop culture and other aspects of life while travelling through New York or other places. Lots of things are described as he encounters them. He sometimes meets up with friends and family who join in the adventure. At the end of episodes is a section called The Other Side where you'll find independent music or publicly available sounds from the present and past. A most interesting listening experience. Be aware that this podcast is relatively long and usually spans around two hours per episode.

The AppleVis Podcast

This branch of the AppleVis website and community offers audio demonstrations and tutorials produced by community members for blind users of Apple products. Stay up to date with this podcast, and you'll be well informed about accessible apps and know how to get the most from your Apple gear. This can be very useful and motivating for beginners who may find navigating websites and documents to be harder as they get used to VoiceOver.

Blind Abilities

This podcast has a focus that goes beyond technology. All sorts of people have been interviewed, and a wide range of topics are covered that relate to blindness. There are very helpful tech tutorials such as the iPhone 101 series included in this podcast, so you're strongly advised to check through older episodes.

Blind Bargains

This podcast has been around for years and features all kinds of tech news from a blindness and low vision perspective. They have covered different conferences and do a lot of interviews with producers and vendors of accessible technology.

Double Tap Canada

This is a show on AMI Audio with a focus on technology used by blind and low-vision people. The hosts are very knowledgeable and manage to interject a fair amount of fun and levity into the discussion.

Eyes On Success

Peter and Nancy Torpey have hosted over a thousand episodes of this blindness-related podcast. It features discussions with all sorts of people who are blind themselves or involved with things that matter to blind people. Guests have included volunteer book narrators, orientation and mobility instructors, and many more besides. I always try to keep current on what the latest episode is about.

The Next Chapter

This is a radio show that has remained on the air for well over a decade. Host Shelagh Rogers talks about books, interviewing authors and others about what they're reading and writing. It focusses on Canadian authors and does a tremendous service to readers wondering what authors to read next.

Three Books

Neil Pasricha is a best selling author of books like *The Book of Awesome*. He hosts a very interesting podcast. In it, he has discussions with various authors and experts about three

books that have been important in their lives. The guests have been very wide-ranging, and their book choices are often surprising.

Semi-prose

This podcast involves a panel of enthusiasts discussing various popular books. They offer their opinions and also interview authors, making for some interesting moments. Imagine being in a book club where the author of what you've just read is present for your discussion of his or her work.

Aaron Mahnke's Cabinet of Curiosities

This short but fascinating podcast deals with strange stories from history. Aaron is an historian and shares a seemingly endless supply of strange episodes a few at a time. Podcasts tend to be around fifteen minutes. He also hosts a longer podcast called Lore that deals more with the supernatural. I've found both to be unfailingly entertaining.

Haunted Places

If you're in the mood for a ghost story, this podcast has you covered. It features dramatizations of different supernatural events that have made places haunted. These episodes may not be suitable for young children. These stories are very well produced with good use of sound and narration.

From Our Own Correspondent

This has been a long time favourite podcast from the BBC. Host Kate Adie presents a range of reports from writers and journalists living and working in different countries around the world. They all share some of their personal experiences going beyond the headlines. Having a glimpse of what life is like in places where news happens makes for an absolutely fascinating show. I've unfailingly enjoyed each episode I've managed to catch for well over ten years now.

More with Anna Maria Tremonti

This former host of an amazing CBC show called The Current now has her own podcast. Rather than news stories, this is about having long conversations with various famous people about all manner of subjects. I've keenly enjoyed hearing these discussions and hope that this show has some serious longevity.

Voices of The Walrus

This podcast features content from the Walrus magazine. Stories tend to be deeper than average magazine articles. They are well researched and read. There are also interviews with the authors. Definitely worth adding to your podcast selections.

TED Radio Hour

Perhaps, you've heard people mention TED Talks. These are typically short lectures that cover a very wide range of topics

usually delivered by people who care deeply about a given topic. The letters in TED stand for Technology, Entertainment, and Design. In the TED Radio Hour, host Manoush Zomorodi introduces an hour's worth of these lectures that all have a theme or area of focus in common. A recent episode looks at loneliness as an example. If you like what you hear in this podcast, you should also be certain to grab the TED app, which makes it easy to explore the thousands of short lectures available from the TED Foundation.

White Coat, Black Art

Health and medicine can make for interesting listening. Dr. Brian Goldman is an emergency room physician who has also become a writer and radio show host. In this podcast and radio show heard on CBC Radio, Dr. Goldman talks about various medical issues, bringing in all kinds of knowledgeable guests as well as patients. As a bonus, he now has a second podcast called The Dose that is more focused on issues surrounding the COVID-19 virus.

Read All About It: The World of Books Made Accessible on iOS Devices

The day was a nice one in the summer of 2017 as I arrived at what I hoped was the correct Tim Hortons near Harbourfront in Toronto. It was where the CNIB had chosen for a meeting point so blind attendees of the Word on the Street festival could hook up with their volunteer guides for the day. I had made a point of calling Falguni, my volunteer guide, prior to this so I had a good chance of recognizing her voice when we met. It took a number of texts back and forth to accomplish that, standing just outside the noisy and bustling place. I had never attended an outdoor book festival before on my own. The opportunity had never come up despite my long-standing love of books. When you lack independent, affordable transportation, there's an increasing tendency simply not to go out of your way to find out about what you have no practical way of participating in. That year, things were different. The CNIB wanted more blind people to attend the festival and had arranged for volunteers to help us enjoy what was on offer. Teaming up with festival organizers, they had put together a DAISY-formatted information book containing a schedule of events and descriptions of what would be happening. I was able to go through this material before attending and have it ready for use while I was there. They had

also paid the cost of transportation for some of us including me. I couldn't say no to that kind of opportunity.

The occasion was unforgettably fascinating. I attended talks by a number of well-known authors. That year, I was able to hear Drew Hayden Taylor, live and in person, reading from his latest book: *Take Us to Your Chief: and Other Stories* – classic science fiction with a contemporary First Nations outlook.

I had first heard him on a show called The Next Chapter. It runs to this day on CBC Radio and is also available as a podcast. My wife and I are regular listeners. He could have been yet another writer forever out of reach, but not that day. He did a wonderful job reading a very witty and amusing part of a story from his book. So good a job that I decided that a Kindle copy of it would make for a fine souvenir of this day. For less than the price of a dinner at a restaurant, sitting right there in his captivated audience, I purchased his book and downloaded it onto my iPhone.

Apple's best public relations people couldn't have designed an event to better illustrate the liberation that was made possible for blind people thanks to an iPhone had they tried. While riding in an Uber car there and back, I could check where I was at any point. The same applied while I was there had I somehow gotten separated from my volunteer. I was able to know

what was happening and have agency over what we went to. I was also able to purchase an author's words in book form while he spoke on the stage. This is the kind of thing I could only dream about doing as a teenager. And then the pieces came together and it happened for real.

Since 2011, I've increasingly done the majority of my reading on my iPhone. It has become my portable book collection, storing thousands of fully accessible ebooks and hundreds of audiobooks. For most of my life, the choice of what I could read and when I could read it depended on the efforts of libraries for the blind. By the time I got to read a bestseller, let alone something more obscure, it was often years after my sighted friends and family had read it and stopped thinking about it. If you were truly desperate to read a popular book while your friends were, you could pay five times as much as your friends paid for a paperback book to get an audio edition on CD. Over the past decade, a great deal of change has taken place. Thanks to the rise in popularity of ebooks and audiobooks, those days are thankfully gone for good.

Apps like Apple Books, Kindle, Audible, and Voice Dream Reader have completely changed my reading world and options. They have been the keys that have at last liberated me from the prison of being in a situation where only a small fraction of

what was published could be obtained in accessible form. The major ebook publishers, lead first by Apple with its iBooks app, let blind people tap into commercial sources of books, paying the same as everyone else does for precisely the same books while they're still brand new to everybody. These books can be read on a Braille display, spoken using high-quality synthetic speech via the VoiceOver screen reader, or narrated by a professional human reader, depending on your choice of book provider and personal preference. No extra work need be done by charitable organizations to make this astounding advance possible. Instead, the work is done by the companies providing the books in ebook or digital audio formats. They invest in making certain their apps are accessible to VoiceOver, which allows the ebooks to be read out loud or translated into Braille and sends the result to a Braille display on the fly.

Over time, conditions have gotten a lot better on other platforms such as Windows and Android. Libraries for the blind were offering digital content that substantially broadened what they could make available. However, things really changed after I got my iPhone 4. Now, thanks to Apple, I could hear about a book that a friend had just read and buy a copy for myself before the conversation had completed.

Twenty years ago, I walked the hallways of my school weighed down by a backpack containing around forty pounds of Braille volumes containing what I hoped were the right fractions of my textbooks for the day's classes. People too close behind me when I turned a corner were apt to be crushed into a wall. I've gone from that experience to where we are today. It's now possible for blind people to own a vast library far exceeding 1,000 accessible books and carry it with them in a pocket. This has profoundly liberated me beyond my ability to adequately put into words. Now the books I own and read are precisely the books I wish to. Although I still make use of a digital library for the blind, the bulk of what I read are books I have purchased, paying the same price as any sighted reader would. Having attempted to write a collection of short stories twice now without success, I realize what hard work writing can be. As someone whose understanding of the world is primarily built on words and stories, I deeply value the efforts of authors. Over the past years, I've made it a personal mission to obtain legal and accessible copies of books that have meant something to me and those that interest me now. Below, I'll discuss the various sources of audio and ebooks that I make use of as well as the apps needed to acquire and read books.

Reading in the Walled Garden

The Books App

Apple tends to favour convenience and simplicity. You see this in all of its stores and apps. Things are as well crafted and simple as possible from one end of the experience to the other. Using the Apple Books app, you are able to purchase and read books, including audiobooks, all from within the same app. The interface is very accessible and intuitive. There's no need to have mastered browsing the web or to register accounts with different book vendors. Everything is handled through your Apple ID. For new users, this is especially compelling. Well over a million books are made available on Apple Books.

Keep in mind, however, that publishing isn't Apple's core business. You may find that the book you want isn't available as an audio or ebook. This is especially true for books that are off the beaten path of bestsellers. Also, other book vendors are far more aggressive with pricing and offering bargains. This makes a tremendous difference if you're buying books all the time. There are free books as well as ones you pay for. Like other ebook publishers, there are special sales and offers. However, obtaining a large library of ebooks and audiobooks using the Books app exclusively will cost you more than it would on Amazon Kindle or other venues. You can get audiobooks as

well, but they can be gotten more cheaply elsewhere presuming patience and discipline. Once we've examined Apple Books, the rest of this major guide section is a deep exploration of alternative sources for acquiring and reading books on your iOS device.

With that said, lets dive right into an overview and exploration of the Books app.

Near the top left part of the screen, you will always find one or more buttons that perform actions or let you access special parts of the app. This is where you'll find any such buttons, so you never need to look near the tabs at the bottom for options. It's a nice bit of consistency with other apps made by Apple that offer digital goods. Such consistency helps make this app a wonderful starting point for reading on iOS devices. As you explore, always explore the area directly below the status bar near the left of the screen for likely options.

There are five tabs across the bottom of the screen that, when double tapped, expose different areas of activity. The Reading Now tab is at the far left. Going to the right across the bottom, you'll find the Library, Book Store, Audiobooks, and Search tabs. The Reading Now tab focuses in on what you're currently reading and what you might want to read. The Library tab contains all content you've chosen to add, including books,

audiobooks, PDF documents, etc. The Book Store tab is where you shop for ebooks that you can read using VoiceOver. The Audiobooks tab is similar to the Book Store but provides access to audiobooks narrated by human beings as well as some audio dramas and shows. Finally, the Search tab is where you can directly look for books whose name or Author you already know. Now that you have an overview, lets examine each tab in greater detail.

The Reading Now Tab

This tab focusses on what you're currently reading and have shown interest in reading. It contains the most recent book you've looked at near the very top of the screen. Also, there is a heading with the most recent books you've opened. You can double tap on a book to get right back into it. You'll also find information about how far along you are in the books plus a More Actions button. Another heading below will list more books by the author of your most recent read. The heading below that is called Want to Read and contains a list of books you've marked as wanting to read. These can be ones you already own or not. Think of it as a combination wish list and a "to read" list.

The Library Tab

This tab is where your personal repository can be found. All of the books you have purchased or chosen to get if they're

free are available here. They're sortable and will automatically be added to a series if they're part of one. Finding what you're after among your collection is painless and speedy. There's an Edit button in the top left area as well as the Sort and Collections button. These let you manage your stash of books and documents as it grows. The total numbers of each kind of document stored in the Books app is displayed. You can also create your own collections of books or choose how the books are sorted within the library. If space is tight, you can remove books from your device, and they'll still show in your library as being in the iCloud. Double tapping on a book in the iCloud will download it to your device.

Because both your Library and the Book Store are combined in one app, it is very easy to get an overview of a series of books, discovering what you already own and still may wish to obtain. For instance, I have several of the books written by the people who give the Massey Lectures as heard on CBC Radio each year. They are all part of the Massey Lectures series of books. From the Library tab, I can double tap on the Massey Lectures series. Once inside, I can choose via buttons near the top to either look at the books I already own or the complete series. If I find a book I'm interested in, I can simply double tap on its price and acquire it immediately. If I had collected this

series from Amazon Kindle, I would need to go to the website and browse to where the series is shown. Amazon doesn't let you accidentally purchase a book you already own, so there's no danger there. However, it is a far more rapid and convenient process to quickly determine what you do and don't own using the Books app.

The Book Store Tab

This tab is where you'll want to go when you're curious to see what's new, popular, and available. The Book Store is always customized for your selected region and will only show you material that is actually available to you. It is a very full screen with lots of sections and books on immediate display. Don't forget that there's always far more available than can ever be shown on one screen. Don't ever give up if what you hope to find isn't immediately obvious.

At the very top below the status bar, you'll find a Browse Sections button. This lets you specify and gain access to an area focusing on a particular genre or other category of interest. Double tap this button and then flick right through the list of possible choices. Double tap on the section of the store that you want to go to, and you'll be taken there. Throughout the Book Store, don't ever worry about getting stuck in a section or book description. Simply feel around the top

left corner below the status bar and you'll find a Back button. This will take you one level back from where you've gotten to, and you'll find more options. You'll always be able to return to the initial screen of the tab you're in.

Throughout all of Apple's ecosystem, headings play an important part of how busy screens displaying many offerings are divided up. Turn your rotor setting to Headings and you'll be able to get around a whole lot easier. To quickly navigate these main storefront screens, flick up or down to move between headings. Once you've reached a heading, flick right to go through the contents found beneath it. Double tap on anything that interests you to be taken to the item's entry. To be certain of catching everything, I sometimes go to the next heading below the one I'm interested in and then flick left over the entries. This is a good practice, since some areas need to be scrolled down through to see everything in them.

These main storefront screens are something I very much appreciate. I tend to get absorbed in my own areas of special interest. These featured collections, top charts, and sections on what's new and trending give me at least a minimal exposure to what's happening in other literary corners.

To purchase a book, double tap on the title to enter the book's space. While this step isn't strictly necessary in all

cases, it makes certain that you end up with what you intend to get. Flick through the information until you come to the price or Get button if the book is free. Double tap on that and then complete the purchase like you would any other in the Apple ecosystem. The book will then be added to your library and will be available to read.

The Audiobooks Tab

Nearly identical in structure to the Book Store tab, the Audiobooks tab has similar headings and sections, allowing you to see what's trending, focus on various interests, etc. Both sections feature top charts for paid and free books with top entries followed by See All buttons to expand and focus on that particular chart or group of books. There are a lot of buttons that will take you to separate areas. In similar fashion, you can browse through various sections and genres of books depending on your interests.

The Search Tab

This is where you can search for something you know the author or name of. It's a basic search field until you actually enter key words, author, title, etc. Once you've done that and hit the Search button that appears at the bottom right corner, you'll find the results neatly divided by headings. These include In Your Library at the top of the stack, Book Store

below those results, and Audiobooks at the bottom of the stack. Go to the heading of interest and then flick right to see what's there. Double tap on what you want. Just keep in mind that there may be more results than can fit on a single screen. To check for that, I go to the next heading down and then flick left, which catches any results that might have been hidden.

All of this is very simple, presuming you have the rotor mastered. If not, you can flick through all the results. Instead of entering and typing anything in the search field, flick right and you'll discover a list of trending searches in the form of buttons. Double tapping on these will execute the appropriate search as if you had typed it into the field at the top left. It's always good to be able to know what others are looking into.

When you find the title of a book that interests you, double tap on it. This puts you in the book's entry in the store. Think of it like picking up a book and looking exclusively at it. The book entry will have a description and other information about the book. There will be reviews, ratings, and lots more. To obtain a book, find and double tap the Get button or the price of the book if the book isn't free. The price will be a button just like the Get button. Follow the

rest of the purchase procedure to acquire the book. It will then be downloaded into your library.

Reading Apple Books

After double tapping on a book title, you are placed inside the book. The Library button found in the top left will take you out of the book and back to your library. While in book-reading mode, the action area at the top left of the screen below the status bar has buttons to help you navigate your book. Flicking right from Library once gets you to the Table of Contents button. Double tap this in order to browse through the sections, flicking right to scroll through them in order. Double tap on the section of the book that interests you. Had you kept flicking right past the Table of Contents button, you would come to the Appearance, Search, and Bookmark buttons. The Appearance button lets you do things like adjust font size, theme, etc. It also lets you choose between a scrolling view or a more traditional page view. Each has implications for reading while blind. The scrolling view performs well for continuous reading, but every once in a while, you'll hear a chunk of text repeat itself before you proceed to the next part of the document. The page view sometimes skips over text while reading continuously. You'll suddenly hear a sentence that doesn't quite fit with what came before, and you'll have to stop and move slightly backwards

so as not to miss something. I suspect these issues will be resolved fairly rapidly by Apple. It's always possible to read any text missed by these current glitches.

The Search button lets you search for key words to quickly find areas of particular interest. Once you've selected a section, double tap on its link to be taken to it. The final button in the action area is the Page Bookmark button. It can be on or off.

To reach the text of your book, go to the Library button and flick left. This puts you onto the text of the book and is a nice improvement over having to feel around for text on the screen. Using two fingers slightly spaced apart, flick them downward together on the screen to start your book reading continuously. Double tap anywhere on the screen to pause or resume continuous reading. Using the rotor, you can also read by character, word, line, etc. This can be useful to determine how things are spelled. You can also jump to any notes, headings, or links. You can create notes by turning the rotor to Edit and flicking down to the option. You can also search for words or look up words once you've used the Text Selection rotor setting to highlight them. Swiping left or right with three fingers will move to previous and next pages. Books can have pictures and

illustrations that aren't always described. Patience and exploring the screen and various options can really pay off.

Sadly, not all Apple books are accessible. Some are simply too graphical to be read by VoiceOver. If you end up with one of these, as has happened to me a number of times, simply find the receipt in your email that is sent after you make a purchase. You can then report problems with the book and/or ask for a refund. You'll need your Apple ID and password to do this. Apple has been very understanding and quick to respond in all such instances that I have needed to do this.

By definition, all audiobooks will be accessible. Should you encounter problems, you can follow similar procedures for reporting problems and/or obtaining refunds if you come across one that's utterly unworkable. Once you open an audiobook, You will find a series of very intuitive controls to skip forward and backward, play and pause, set a sleep timer, and switch the audio to any speakers or AirPods you might want to. The Table of Contents button is present here as well, and you can instantly switch between all tracks included in the book. You can also adjust the speed of narration.

Kindle Books

I was absolutely overjoyed when word reached me in 2013 that Amazon had decided to make its Kindle app accessible using

VoiceOver. There had been a way to read these books on Windows PCs, but it was annoying and poorly implemented. Thankfully, the iOS app received some real loving attention from someone who understood what was needed to make it not only workable but a downright attractive means of reading books. All at once, over a million books including all the popular bestsellers were rendered completely accessible and enjoyable. What's more, even the books that were far from bestsellers on topics like game design were now within my reach.

The main business of Amazon is selling products made by others. It was selling ebooks long before Apple came up with Apple Books. The books are read using VoiceOver, which means you can use any of the voices available to the screen reader. This includes extremely high-quality voices like Alex, any of the Siri voices, and other well-known options. Prices of Kindle books are equal to or lower than Apple Books prices. There are many more book sales and special bargains on the Kindle bookstore than on Apple Books. Because VoiceOver is used for reading Kindle books, people who have Braille displays can use them to read any Kindle books in Braille translated on the fly into the format of their choice. Amazon also owns Audible. A feature called "Whispersync" lets you buy the Audible book at a reduced price and then keeps track of your position in both the

audio and ebook copies. Blind users can then switch at will between hearing a human narrate a book to reading it themselves in Braille. We've never had that flexibility before.

Kindle books are quite small files. I have nearly 2,200 books, and they take up just over 12 GB of space. I find that Kindle books are the best option for anything I want to use as a reference rather than simply enjoy sequentially. Sometimes, I'll get both Kindle and Audible copies of a book I like so that I can always have it with me. Audible does a good job of compressing books, but they're still much larger files.

The Amazon Website

You need to use the Amazon website to obtain Kindle books. Be certain to register with the correct Amazon site for your location. For Canadians, amazon.ca and for Americans, amazon.com. Some books are only offered in certain countries. Also, book deals and special offers may differ.

First, register an account with Amazon on the appropriate site. Next, get the Kindle app from the app store on your iOS device. You can then open the app and will be presented with an option to register your device with the account you created on the website. Once that process is done, you will be ready to acquire and read Kindle books.

You can use your computer as well as your iOS device. The NVDA screen reader, as well as other popular screen-readers like Jaws for Windows, support reading Kindle books on the PC.

The layout of the Amazon website will differ, since there is a special mobile version that will be used on your iOS device, or you can request the full desktop site be used. There are advantages either way. The mobile site is far less cluttered. This makes purchasing books as easy as it can possibly be. However, if you want to return books, I find that using the full site becomes necessary.

Once you're logged in, find the Shop by Department link. This brings up a menu of links leading to different departments on Amazon. Go to Kindle Store. Once there, flick right and you'll cross links that lead to Kindle Devices and will come to Kindle Books. Activate that link to go to the entrance page to the Kindle Books area. Now, any searches you do with the search facilities on the site will be focused on Kindle books.

You'll find headings highlighting various featured books and links to different sections and categories of the bookstore. If you find a book you want to buy or obtain as a "free" book, double tap on the title to go to the book's entry on the site. Once there, you can read the book description, reviews, and other information. You can also buy the book. Free books require

the same process as ones that cost money. You simply won't be charged. Search for a classic book like *Treasure Island* to try obtaining a book. Many classic books are free and so are some modern ones. I haven't found a way to limit searches to free books or any way to browse all free books on the site. There are doubtless thousands.

Be sure to sign up for the Kindle Daily Deal newsletter. Also, each month, look through the Kindle monthly deals. You can get great books for very low prices. I've bought many great books by adding them to my wish list and waiting until they went on sale. You can sort your wish list by using the List Actions link. Hitting that brings up options that you flick right through. Sorting is one of them, and you can sort by price from low to high.

There's never a rush. Take your time and really explore the Amazon site. It pays off.

The Kindle App

Kindle takes a different approach to its interface than the Apple Books app. This approach has changed a lot since I first wrote about it in this guide. When you open the Kindle app under normal circumstances, you will be in the Home tab. I need to give this qualifier, because things may be different if you haven't registered the app yet. Before acquiring any books,

you'll need to create an amazon account and register the app with that account so that books are delivered to it. Currently in December of 2019, the Home tab is a bit troublesome to navigate with VoiceOver due to a distinct lack of headings. There are sections of this home page including From Your Library, Most Wished for Books, Recommended for You, etc. However, they aren't denoted as headings. You basically have to flick left and right or scroll through the contents of this tab. Due to this, I make absolutely no use of it. Perhaps, they'll improve on it by the time this guide reaches you.

There are five tabs across the bottom. At the very left is the Home tab. To the right of that, you'll find the Library tab. Right of that in the very centre of the bottom is a tab that will contain the title of whatever your most recently read book is. Double tap on it to open the book to where you last were. Next over is the Discover tab. It does have a couple of headings. Frankly, I think it would better serve as the base for a Home tab. It provides information about new releases and what's currently popular. Finally, over on the far right, there's the More tab. This is where you'll find a number of important buttons. These include a couple of buttons related to the "Goodreads" community. Think of that as a kind of social platform for book lovers. You can read about what others are

reading and contribute reviews of books you like. One button lets you manage your Goodreads profile, and the other lets you access the Goodreads community from within the Kindle app.

This community was around long before Amazon acquired it. If you prefer, you can also access Goodreads from the website or use the actual Goodreads app that is free from the app store. This is what I typically do. By integrating your Goodreads account with your Kindle account, it becomes easier to keep Goodreads updated with what you're reading in the Kindle app.

Other buttons in the More tab include a Sync button. This lets you make certain that all devices you might choose to read a Kindle book on know where you are in any book in your collection. It also makes certain that the libraries on all your devices are up to date. You will also find Help and Settings buttons. The help offered from within the app is pretty useful but doesn't offer much when it comes to using the app with VoiceOver specifically. However, it does explain a lot about features in the app as well as about reading Kindle books. The Settings button includes areas where you register and update your account settings. You can also do things like change the font and spacing of books. It's worth going through those settings to see if any make your reading life easier.

Most of the screen is used to display your collection of books or the book you're reading. At the top of the main library screen, there are a number of buttons as well as a search field. The Notifications button in the top left corner lets you access a notifications area containing anything Amazon might want to inform you of. Double tap the button to access those, and double tap the Done button when you are finished managing and reading the notifications. Past the search field, you'll find a Filter button letting you focus on parts of your book collection. Next to that are All and Downloaded buttons. The Downloaded button switches the library view to only show books you've downloaded onto your device. The All button shows books in the Cloud as well as those on your device. The Filter button lets you show either books or personal documents you've sent to your Kindle cloud, or both books and personal documents. Past that Filter button, you'll find one called View and Sort. This lets you sort the contents of your library in several ways including by most recently viewed, author, title, or publication date. Double tap on a book title to enter the book.

Reading Books in the Kindle App

The first time you open a book, you'll be presented with information about it. You can go through this or close it. At that point, the whole screen is taken up with the book itself.

Swiping down with two fingers starts continuous reading. Double tapping anywhere on the screen will bring up a menu of options. One of these is Exit, which returns you to the book you're reading. The next is Close Book. This closes the book and returns you to the library or whichever tab you might have been in before reading. You get to options in the menu by flicking left or right. Double tap on what you want to access. One of the first options you find is Navigation Drawer. This is a kind of submenu that opens when you double tap it. I use the Navigation Drawer frequently, since it's how you quickly reach part of a book. There are options for each chapter or part of a book. You'll also find other options dealing with getting around inside a book. Flick left or right through the options and double tap what you want to do.

While reading, you can use a three-finger swipe left and right to turn pages. You can also use the rotor and all normal VoiceOver controls to read by character, word, line, etc. The double tap and hold gesture brings up yet more options to highlight things in a book, create notes in a digital notebook, look up definitions, share and copy passages of text, and more. Great for study notes.

The app packs a lot of options into the menu. If VoiceOver Hints are enabled, you'll get enough instructions to get you

going. Exploration is rewarded. For example, the "X-Ray" option available in many books presents you with information about characters, people, and other important things like terms and concepts in books. Better than Cole's Notes but it's not available for all books. Another hidden gem is "popular highlights", which shows what others have taken the time to share as being particularly notable. You'll also find it possible to look up word definitions from within the app. Amazon has been improving the Kindle experience for a long time. Far longer than iPhones existed. The result is a nicely polished, largely stable app that rewards exploration.

Other Sources of Ebooks

There are many smaller online stores and ebook publishers. This gives independent and new authors a lot more capability to sell their works. It also allows for different methods of funding and different selling arrangements. This makes books from independent authors and books on less popular topics accessible to blind people. I have many books on game creation and design that I've obtained from different sources of ebooks. I paid no more for these accessible books than any sighted customer would. It's exceedingly unlikely that any of these books would turn up in the CELA Library, BARD, or other accessible libraries.

Keep in mind that these ebook providers don't have the same kind of resources as Amazon or Apple Books. They are often very small businesses or even individual people with the skill to set up and run an online site. Depending on their skill and awareness of accessibility issues, their websites may be very different or tricky to use. Also, books may be less navigable due to lack of proper accessibility tags in the files. This won't matter as much for pleasure reading but would make referencing and study more difficult. People should be very comfortable with browsing the web if they want to take advantage of these different sources for books. The rotor is very useful getting to headings, links, buttons, and other elements. I also recommend they obtain the Voice Dream Reader app from the app store. While not strictly necessary, it can make certain that you'll be able to navigate your purchased ebooks with relative ease and choose from a wide range of voices for reading.

When downloading using Safari, Once you click on a download link for a book, flick right and you come to "Open In" options. There is also a More button that lets you import the file into the app you want to use to read the file. You need not stick with the default options. The Voice Dream Reader app is great for dealing with ePUB, PDF and other formats provided there is no digital rights management or DRM protection. Kindle books

usually have DRM and cannot be read outside of their own special app. However, these alternative sources of books don't use proprietary formats, making for more options for reading.

Payment is easier if you have a credit card. Many places accept PayPal, which can work directly from your bank account if you set that up. This is useful for people who don't have credit cards. Apple Pay may be available in more places as time goes on. It can be used on Kickstarter. As with PayPal, you can add a bank card and use it rather than a credit card.

Story Cartel

www.storycartel.com

Story Cartel offers free Kindle or PDF copies of books in exchange for your honest reviews of them. These reviews can be published on Amazon, Goodreads, or your own blog if you have one. The purpose is to form relationships between readers and authors. Remember that you have around a month after obtaining a book to post a review and give the link to that review to Story Cartel by completing the form related to the chosen book. You won't be able to obtain more books until you provide links to your reviews.

Kickstarter and Indiegogo

www.kickstarter.com

www.indiegogo.com

Kickstarter and Indiegogo are often used to fund books that may be of interest. For example, roleplaying gamebooks are often funded through Kickstarter and released as PDF or ePUB files. These can be read using apps like Apple Books or Voice Dream Reader. Many labours of love are crowd funded through these sites. For instance, a couple of books titled *You Are The Hero* were crowd funded and written by Jonathan Green, a very knowledgeable author of Fighting Fantasy books. These books examined the history of this very popular series of adventure gamebooks.

CRC Press

www.crcpress.com

This is a great place to get textbooks. Books sold as ebooks use the VitalSource Bookshelf app and are in a proprietary format. You need to use the VitalSource Bookshelf app to read these books. The Windows PC app is also very accessible. Both are designed to work with screen readers. People looking for any sort of academic book should check this site out before giving up hope. They even go to the trouble of describing pictures and more visual items.

Bundle of Holding

www.bundleofholding.com

This is a great resource for people interested in roleplaying games, game design, and creating believable fictional worlds. Books are offered in bundles, reducing the cost and typically contributing to charities at the same time. Bundles have basic and bonus content depending on how much you decide to spend.

DriveThruFiction

www.drivethrufiction.com

This site offers a wide range of lesser-known books including mysteries, romance, fantasy, horror, and science fiction, among other genres. Books are offered in PDF and other popular formats. They are watermarked to identify you as the purchaser. Annoying to hear read out loud on each page but makes it easy to move by pages by searching for your own name.

StoryBundle

www.storybundle.com

This is a favourite source of books for me. Books are sold in themed bundles. These are written by indie authors and are curated by people including authors who have a strong knowledge and interest in the genre or theme of the bundle. Bundles have a basic collection as well as a bonus tier that can be unlocked by paying more than a minimum amount, which increases as more people purchase the bundle. Books are free from DRM of any kind,

relying on the honesty of customers not to share books they've purchased. They are in PDF, ePub and Kindle formats, so there's certain to be one you can use with your favourite reading app. Once you've created an account with StoryBundle, you can always download bundles you've purchased previously. A link to your personal download page is sent via email when you purchase a bundle. Usually, there's one bundle being featured on the site. If you click on the covers of books that interest you, a dialogue pops up letting you read about the book whose cover you double tapped. Finding the Close button requires feeling around on the screen. I often turn to Google to find out about books within a bundle, but the dialogues are fully readable using Safari and VoiceOver. Patience and exploration are rewarded here. There's an edit field where you can put in the amount you want to pay. The amount automatically in there is just a suggestion. Look at the bundle to see what the current minimum needed to unlock the bonus is. As long as you're a cent above that, you'll get all the bonus books. It changes as time passes.

Voice Dream Reader

Voice Dream Reader is an app that makes reading different kinds of documents simple and accessible. It can handle ebooks in PDF and EPUB formats provided they aren't protected by digital rights management or DRM.

It can't read Kindle or Apple Books, since these ebooks are protected by DRM. Many government forms and other documents are available online in PDF format, which Voice Dream Reader can handle. While reading forms is possible, filling them out isn't. While basic text editing is possible, think of Voice Dream Reader as a reading tool. It can handle zipped audiobooks, including MP3 files and DAISY format books like those from the CELA Library.

A real strength of this app is that you can treat documents like music, literally playing them in the background. This lets you use your EarPod controls to play a book while on a bus without having to have your iOS device out of pack or pocket. It can work with the screen locked just like you can play music with the screen locked using your headset or earbud controls. For greater control, you need to unlock the screen and have your device handy. The app is designed to help more than just blind people. There are ways to change how documents are displayed so that reading is easier for visually impaired people and people with other reading difficulties. These are found by double tapping the Visual Settings button. This button is only revealed once a document has been opened for reading. Similarly, the Audio Settings button lets people customize how documents sound. Different synthetic voices can be acquired and managed. Speed,

pitch, and volume can be set. This app makes extensive use of popup menus. Clutter is kept to a minimum. For instance, the Add button at the top left of the library reveals a popup menu of the many ways to add documents to your library. The same holds true for Settings, Sorting Options, and more.

The Library

Whenever you open the app, you arrive at your library of documents available on your device. This library can be backed up to iCloud and/or stored and synced on iCloud Drive and other devices where you have installed Voice Dream Reader. At the top left is the Add button. This lets you add documents from different possible sources such as Dropbox, etc.

Filter is to the right of Add. You can organize documents into groups, view only documents from a certain source, or look at only flagged or unread documents. For a large collection of documents, creating folders is best. That's done in the By Folder button in the Filter popup. After hitting that, you'll find options to add folders and edit their order or names. You cannot create folders from the initial library screen.

Edit is found to the right of Filter and lets you reorder, move, flag, or delete documents. Double tapping on a document selects it. This lets you select and move or do other things to many documents.

Search is found to the right of Edit. This lets you search for documents within whatever filter you're currently in. If you haven't created any folders or selected a certain group of documents, this would search the names of all files in your collection, displaying those whose names contained what you typed in the search field.

After the search field, you reach the start of your collection of documents or what is within, depending on the filters you selected. This can be flicked through or scrolled through with three-finger upward or downward swipes. Very useful with large collections containing many rows of documents.

The bottom right of the screen contains further options including:

Sort — Lets you sort documents in different ways such as by date added, length, etc. Double tapping this causes a popup menu of options to appear. Flick through them and double tap what you want.

List View and Grid View — These two options arrange your collection of documents into a grid or list. I find the list view more useful.

Settings — This causes a popup menu of settings to appear. These let you choose and manage Cloud synchronization, set up content sources like Bookshare, and manage or acquire voices to read your documents. You can also obtain help and a copy of the user manual if needed. The manual is short and takes under half an hour to read through. It is organized into headings. You should read this to get the most out of the app. There is also a shorter Quick Start guide.

Now Reading — This will always take you directly to where you left off in the last document you were reading. It is always at the bottom right corner of the library screen. Double tap it to use it.

When Inside a Document

There are many more actions available from within a document.

Home — This gets you back to the library screen and is found at the top left of the screen.

Actions — This presents you with a series of choices, letting you export or share the document. You can also edit the text and title of the document with the Edit option found at the right end of the Action popup menu.

Reading Settings — There are various reading modes to specify whether you stop after finishing a document, keep going through your collection, read by touching text with your finger, or other options. A timer is available that you can use to stop reading after a given time.

Audio Settings — This is where you can choose your preferred voice, obtain new voices, and increase or decrease speed, volume, and pitch. This lets you quickly make adjustments. Flick up or down on the Audio Setting button to adjust speed. Double tap it to get to other options used less frequently. There are many voices available for \$3 up to \$6 Canadian. Purchased voices will be downloaded to your device and installed. You can always remove and download them again as needed once they've been purchased.

Visual Settings — There are many options including color, font, how many lines are visible, cursor position, and much more. These can help people with learning disabilities as well as vision impairments. "Pac-Man mode" is said to help increase reading speed by eliminating words the cursor goes over.

Add Bookmark — You can add as many bookmarks to documents as you like. This can be useful when a document isn't well formatted and doesn't have headings to help navigate quickly through. Once bookmarks have been placed, you can move back and forth using the Headings, Bookmarks and Highlights option or via setting the navigation unit to Bookmark and then fast-forwarding or rewinding, flicking up or down with the Play button.

Reading and navigating through a document is done with easily operated controls. Under the area where the text is displayed, there are controls. Touch the bottom right of the screen and flick left or feel around on the lower left of the screen to find them. You can treat your document like it was music. Play and pause by double tapping the Play button or your EarPod controls. Flick up or down on the Play button to move back and forward. Flick right of the play button to find a Navigation Unit button. This also responds to up or down flicks, letting you choose how much flicking up or down on the Play button moves you. This can depend on how well the document

you're reading is formatted. Some don't have headings but still let you move by sentence, paragraph, page, etc. You can also move to the prior or next bookmark if you've created them in the document. If nothing else, you can always move by percentage of the document.

The CELA Digital Library

This service offers a vast array of resources to people who are blind, visually impaired, or have other print disabilities such as learning difficulties preventing them from reading print. This collection includes audiobooks, magazines, newspapers, and much more. There is no charge for library patrons to use these resources. To register with the website, people will need to know their library account number. If they don't know their account number or need assistance, they should call 1-855-655-2273.

There is a Help link near the top of the site. This gets you to tutorials and instructions, which are very useful for newcomers to the service. Calling the number given on the site will put people in touch with helpers who can talk you through any initial difficulties and explain things.

Anybody who used the CNIB digital library before it became the CELA Library will have a valid library account number. They will likely find they are already registered in the system.

After registration is complete, you can make use of the library and services. People who haven't logged in may still explore the site and gain a good grasp of what is there.

General Overview

People need to be comfortable browsing the web to make good use of the site. Provided beginners take their time, it is a good site to learn how to browse the web on. No risk of accidental purchases, since there's nothing to buy. It has been designed for maximum accessibility and is very easy to navigate. Flicking left and right will get you through the various elements. There are headings marking different key portions of the site, and the rotor is very useful for getting around quickly.

My Library

Near the top of the page is the My Library link. This gets you to where you can customize and manage your service. You can view information on any loans or books you've placed holds on. You can create reading lists. Also, you can change your personal information and password. There are links and headings to help get around. You can change search preferences here including which accessible formats to include in search results. I did this when I heard about DAISY text magazines being made available the same day they're published in print. By ticking a

checkbox, I added the format to my results. I unticked many formats that don't interest me such as DAISY CDs and other physical formats. If you own a Braille display, books are available in electronic Braille formats. However, I have yet to find an app that makes reading them easy. VoiceOver translates regular ebooks into Braille. You could therefore use Voice Dream Reader to read DAISY text format books on your Braille display.

After adjusting preferences or other settings, keep flicking right and look for a Save button that you can double tap to save any changes you made.

Recommended

This area features popular books and recommendations based on current community favorites. Headings separate different groups of recommendations and make browsing through possible next reads very easy. There are bestsellers, books focused on a current area of public interest, community picks, and reader suggestions. There is also information on how you can suggest books for recommendation to others as well as suggest titles to be added to the collection.

Searching for and Checking out Books

On the home page, you'll find a form that lets you do simple searches. If you know the title or author of the book you're interested in, type it in that form and flick right to

the Search button and double tap it. This will perform the search. Wait around five seconds for the first page of results to load. Each found entry is under its own heading. Turn the rotor to Headings, flicking down to get to the next entry and up to go backwards. Flicking right will let you read any information displayed about the entry. This will include a description. You will come across a Play button, letting you hear samples of audiobooks in Direct to Player format. You'll also come to a Get It button for each entry. Double tap on this to check out the book. Direct to Player titles will be added to your bookshelf. For other titles such as the new magazines in DAISY text format, you'll need to download them to your reading app of choice. In Safari, you'll find an Open In button with a default app that may be what you want. If not, there's a More button. Double tap that for additional options to appear in a pop up menu. One of these will be Import to VOICE DREAM READER if you have that app installed.

To the right of that Search button used with the simple search form, there are Advanced Search and Browse by Category options. These let you perform more detailed searches or simply look at what fantasy, science fiction, or non-fiction titles are available. When using the Browse By Category option, a search is performed after you choose a category, and results are ordered

by date added. Some categories have subcategories. Take time to examine the site and learn your options.

The Newsstand

This area gives access to newspapers and magazines. Headings indicate the start of different areas. There are headings for newspapers, audio magazines, DAISY text magazines and other sources of news. Once at a heading of interest, flick right to go through the contents of that area. There's plenty of help available. For instance, when looking through newspapers, you'll find a Help With Newspapers link right above the list of available newspapers.

The Dolphin EasyReader App

www.yourdolphin.com

(Interview reconstructed from a Kelly and Company show.)

Available free in the app store or Google Play.

Host: A lot of libraries for blind and low-vision patrons around the world offer content in DAISY, ePUB, and other formats. This can include everything from access to newspapers, magazines and books. The Dolphin EasyReader app lets people easily tap into this content using their Android or iOS devices. This week, our audio entertainment and tech expert Michael Feir will take us on a tour of this free and useful app. First of all though, can you tell us who Dolphin is?

Michael: They are a company from the UK which are best known for creating the HAL screen reader and Supernova magnification software. Neither were very widely used in North America but they were far more successful in Europe. Now, they've created the Dolphin EasyReader app to help people all over the world access library content more easily.

Host: What do they hope to gain by doing this?

Michael: Making this app available has really put them on the map globally. Individual libraries don't have money to spare to develop and maintain their own apps and software. However, as the Marrakesh treaty has enabled more accessible books to be shared internationally, having one app which any special library can use makes a lot of sense.

Host: What's so special about being able to read Direct To Player DAISY books?

Michael: This format allows libraries to place books on a digital bookshelf for clients and send them directly to their book player. For instance, people using Victor Reader devices can use these books. Once finished, books can simply be returned which removes the files from the device making room for more titles. This means that people more unskilled with browsing websites can simply call their accessible library, ask for a book, and have it added to their bookshelf. The next time they

turn on their player, the book will be available. Dolphin EasyReader lets people use these books on their iOS devices.

Host: Is it possible to browse a library's offerings from the app?

Michael: No. You'll need to use the library's website to browse and check out books. The only exceptions to this are the publicly available ePUB and Project Gutenberg libraries. However, once you supply Dolphin Easy reader with your account and password for a library, you can then use the app to retrieve and read books you've checked out.

Host: Tell us how this app is laid out.

Michael: Things are kept as simple as possible. There are no tabs across the bottom. Instead, there is a "side menu" button on the top left corner. You can double tap that to cause the menu of areas to pop up. At that point, flicking right will take you through the options. Double tap on the one you want. Once you've done that and are in an area, flick right through the contents or options.

Host: Describe the "my books" area.

Michael: This is where any books you have on your device will appear. Simply double tap on a book to open it for reading. In case you have a lot of books, there are options to search for and sort the contents.

Host: What can you do in the "Manage Libraries" area?

Michael: This is where you can enable or disable libraries which you want to access or don't want in your side menu. Beside the name of each possible library the app supports, you'll find an on/off switch. When that switch shows as on, the library will appear in your side menu as an option. For the ones you want to access, you'll find that when they're switched on for the first time, a dialog box will appear expecting you to enter your credentials for that library. You only need to do that once and the app will remember them after that.

Host: Once a library is added to the side menu, what happens when you double tap on its name?

Michael: You enter into that library's area. In there, you'll find any books which you're already put on your device from that library as well as any books you've added to your bookshelf that you have yet to officially borrow. Beside each book's name, there's a "book information" button. Double tap on that to read information about the book in question. In that information area, you'll find a "borrow" button if you have yet to borrow the book. Double tap on this and you can then either open the book as a stream or download it to your device. If you're connected to WIFI, streaming works quite well and saves you the storage space the book would otherwise take up. However,

if you'll want to read it while away from WiFi, download the book and it'll be on your device. Once you're finished with the book, the "book information" area has a "return" button letting you give the book back to the library and freeing any storage space used. Once you've borrowed a book, double tap on its name to be given the option to open it as a stream or download it.

Host: How easy is it to read and navigate books in Dolphin EasyReader?

Michael: Once you've opened a book as a stream or download, you'll be in the reading area. Here, there are buttons letting you set text and audio preferences. This includes the ability to purchase a selection of reading voices. The visual settings let you control font and highlighting among other things. You'll also find a search button for looking within a book for certain words. There's a button called "library" which returns you to the library. If the book includes text, you will find that available. It can be read with VoiceOver using the rotor and other standard reading gestures. otherwise, you can read it as if it were an audiobook using the next, previous, play/pause and navigation buttons. There are also navigation settings which let you choose how large sections should be which are jumped to using the previous and next buttons. DAISY books and many ePUB books include headings which are also available using the

"navigation" button to discover and jump between. Basically, whether you want to simply enjoy the book reading it cover to cover or use it for reference and jump around, this app has you covered very nicely.

Host: After the list of libraries, there's the "my newspapers" button. Are there accessible newspapers available to Canadians?

Michael: You can read accessible newspapers from the CELA website. However, they aren't available through the EasyReader app. However, users in other parts of the world can tap into such services.

Host: What does the "my clipboard text" button do?

Michael: This lets you read anything that you first copy to the clipboard from another app. I've never had any occasion to use that feature but it may come in handy for people with low vision who aren't familiar with the VoiceOver or zoom features of their iOS device.

Host: Is there any help in the "about and Help" area?

Michael: Surprisingly, not a lot. There's a button which takes you to an online forum where help is presumably available. Also, there's a link which takes you to the Dolphin website. A button which says "help for EasyReader" takes you to a place on Dolphin's site which will apparently contain some sort of help

at some point. However, it's not there yet. This absolutely left me gobsmacked when I found out about this lack. Hopefully, they'll correct this oversight. Meanwhile, you can find help on the CELA library site and also on YouTube where CELA has a series of videos detailing how to use this app. Presumably, other libraries the app gives access to have also created some sort of user help. The RNIB is a good bet there.

Host: What can we do in the "My Dolphin Account" area?

Michael: You can log in or out of your Dolphin account. Also, you can decide whether you wish to be notified of any changes to the app via an email. Turn on or off the switch next to the explanatory text to decide this.

Host: Thanks for giving us this tour of the Dolphin EasyReader app. It is available free from the app store.

Hitting the Cookbooks

There are countless cookbooks available on both Apple Books and Kindle. In both cases, one issue to be ready to deal with is that unlike other reading, you'll be leaving and then coming back to a recipe as you work on making it. You'll likely need to navigate minutely to hear part of a step again or a number you forgot. Unlike pleasure reading, you'll be making use of the VoiceOver rotor as well as the search and book navigation capabilities of the reading app for which you bought your chosen

cookbooks. If you are successful in finding and using a recipe, you'll have the skills you need to tackle using VoiceOver and book reading apps for other productive and academic purposes. This could be a very tasty way of mastering some very useful and important VoiceOver skills.

Below, we'll go through the process of exploring two cookbooks. One of these is in the Apple Books app and the other is using the Kindle app. In each case, we'll find our way to a recipe and discuss how to navigate it. If you prefer one app over the other, chances are very good that any cookbook you might wish would be available in your preferred app. In both markets, you should watch for sales and deals that can drastically reduce the cost of wanted books. As the process of acquiring books is covered elsewhere in the guide, this section presumes you know how to do this.

Before we continue, let's take a moment to think about audiobooks as cooking aids. The reason I have reservations about using a commercially produced audiobook for this purpose is that they aren't all that easy to search. Once you actually get to a recipe, you could easily rewind or fast-forward to find the part of a recipe you need to hear. However, getting to that specific part of an ordinary audiobook would be quite time consuming, since you can typically only navigate by chapter. What's more,

these chapters are normally numbered sequentially rather than named. Also, you couldn't find out how things were spelled without consulting an external source. Ebooks are far smaller, easier to navigate, and spellings are there in full. The only possible downside is that any pictures may not be described.

Books produced in the DAISY format tend not to be as current, as it can take a while to produce a DAISY copy of a book. However, they are far more navigable, having multiple heading levels as well as often having the complete text. Additionally, any pictures or tables are likely to be fully described and/or presented in a way that is easy to follow. Apps like the Dolphin EasyReader let you easily download and read DAISY books that are made available through digital libraries for blind and print disadvantaged people. In Canada, the CELA Digital Library is now the resource where these books can be obtained. Once you've signed up and have an account, you can typically access any available books and magazines for free. Using DAISY books with the Dolphin EasyReader app is covered in the Read All About it section of the guide.

Exploring a Cookbook in the Apple Books App

I began my cookbook exploration with the Books app, figuring that it would be a likely starting point for people with iOS devices. If they are new to the Internet and all things

online, it would be a natural first place to go for reading material. Googling around for popular cookbooks, I kept coming up with references to Mark Bittman's *How to Cook Everything*. Searching in the Search tab, I very quickly found that the 10th anniversary edition was available for around \$25 Canadian. I bought this and then double tapped on the book to open it.

This book lives up to its name. There are 2,000 recipes and lots of cooking advice contained in over 2,700 pages. In Braille, a book like this would require many volumes and serious shelf space. On my iPhone, it takes up a negligible amount of storage. Double tapping on the book cover opens the book and places you at the introduction. This is on page 22. Most of the space before the introduction contains the table of contents. However, scrolling through these pages with three-finger swipes to the right to go backward or left to go forward reveals a large number of acknowledgements from the author to those who helped him write the book. Rather than having to scroll through the table of contents pages, simply double tap the Table of Contents button, and you'll have it all laid out complete with links you can double tap to get to the indicated section. Once there, touch a little below the top of the screen to get onto the text of the book. You can also flick left or right until you come to book text. At that point, flick down with two fingers to

begin continuous reading. Perform a two-finger single tap on the screen to pause and resume reading.

That takes care of the basics. However, to truly put a book like this to proper use, that VoiceOver rotor needs to come into play. Turn it to Characters, Words, or Lines to look at numbers to make certain you have them right or find out how to spell the name of a spice you've never heard of before. Many pages contain links that you can get at by turning your rotor to the Links setting. Flicking up or down will move through any links on a page but won't move beyond a page. Therefore, when you go to the "List of Recipes" in the table of contents, you'll find a page with a single link on it that says "Here". Reading the full text informs you that this link takes you to a specially compiled table of recipes from each chapter. Sadly, the book doesn't make use of headings, so it doesn't appear that there's a quick way to jump to the start of a particular chapter's recipes. You'll need to scroll through the multiple pages of this compiled list using three-finger swipes left or right to move to next or prior pages. Turn the rotor to Links to flick through recipes on that page and also to chapter links. When you move to a different location, give the book up to three seconds to load the new data. It isn't all in memory all the time. The chapter names themselves actually are links, so you'll at least be able to get

to the beginning of a chapter's recipes that you're interested in and browse them. If you know the name of what you want to make or find out about, it's likely quicker to use the Search option found near the top of the screen. You can double tap this button, double tap on the search field, and type in the word or words to look for. After typing them, double tap on the Search button on the bottom right of the virtual keyboard. This executes the search. Flick right and you will find results where the words you have typed appear in the book. The more precise you can be with the name of a recipe or topic of interest, the faster you'll get where you need to be. In many cases, once you go to a result by double tapping on it, there will often be a link in the text that can take you to a related place in the book with more information and/or a specific recipe. This kind of searching isn't quite as intelligent as Google when it comes to what you might intend when you don't know the exact name or words.

Not all Apple Books are created equal. You may find that some cookbooks have better navigational aids than others. Also, keep in mind that these books and apps are designed for sighted people. If you could see the context in which your search results appeared, it might be quicker to pick out the start of a recipe from a simple mention of your terms somewhere else in the

text. The more familiar with a book's structure you are, the faster you'll be able to get where you need to.

How to Find a Chicken Recipe

I love eating chicken for dinner. Mostly, I keep things simple and use boneless chicken breasts that I throw on the electric grille or in the oven. No doubt, there are many different things to add to chicken that I've never considered. A cookbook like *How to Cook Everything* likely has useful information and perhaps a different recipe or two. Let's see about finding one.

First Method

1. Open the *How to Cook Everything* cookbook in Apple Books by double tapping on its cover. Feel free to use a less-expensive cookbook here but be aware that best navigation techniques may differ.
2. One easy way to start would be to go to the Table of Contents and find a chapter related to what you're interested in. Double tap the Table of Contents button and then touch the screen a little below the top. Once you find chapter names, flick left or right to start moving through the list of them. Double tap on the chapter you want. In this case, chapter 11 is called Poultry. Within seconds, we're a thousand pages into the book at the start of the chapter. You could then start reading continuously through the chapter, learning all about cooking different birds including chicken. Turning the rotor to Links and flicking down, you quickly come to Roasted Chicken Parts. Double tap on that link to get to this recipe.
3. You could continue to look through the pages of this chapter by performing a three-finger swipe to the left, advancing page by page. On each page, you could then turn the rotor to Links, flicking down to see what recipes are linked to on each page.

Second Method

1. Lets make use of that list of recipes so we can look through related choices. Double tap on the Table of Contents button, and then flick right to find the List of Recipes after the introduction. Double tap on this to get to the page.
2. Turn the rotor to Links and flick down to get to the Here link. Double tap on this, and you'll be taken to the start of the table of recipes.

3. To navigate this mammoth list, turn the rotor to Links and flick up or down to move between recipes on that page. Remember that passing the top- or bottom-most link on the page and continuing in the same direction raps around to the opposite link. If you find a recipe of interest, double tap on it to be taken there. If not, simply do a three-finger swipe to the left to go to the next page. Remember that the chapter on poultry is chapter 11, so you can quickly scroll through earlier pages, checking for the Chapter 11 link. Once you find that, you're in the right area of this list and should proceed more slowly. Check the recipes on each page and then do a three-finger swipe to the left to move onward to a new page of recipe links. Your rotor may end up switching to Actions as you move from page to page, so if you hear something unexpected, turn the rotor to Links and continue browsing.

4. I browsed through a number of pages in chapter 11 before finding a recipe for Roast Chicken and New Potatoes. I double tapped on this link and was taken right to the start of the recipe. It sounds delicious and is designed so everything cooks at once. I can set the rotor to Lines, reading step by step through the recipe as I need to. I could also use other features of the Books app to cut and paste the recipe into a note or another app. More simply, I could double tap the Bookmark button and mark that page so I could quickly get to the start of the recipe when needed.

Third Method

1. I feel like bacon and eggs this morning but am curious to see if there might be an interesting and tasty way of doing my favourite breakfast that I haven't experienced. This seems like a good candidate for using the Search button, so I double tap that and type "bacon and eggs" into the search field and double tap the Search button in the bottom right of the screen.

2. Flicking right, I pass the Text heading. Any results from the book will be below or to the right of this heading. I'm disappointed that there are only five hits for the phrase "bacon and eggs". Not being a pasta fan, the most promising hit here would be the "Warm Spicy Greens with Bacon and Eggs". It's not really what I'm after, though.

3. Repeat steps 1 and 2 with different words to continue searching. While this book has 2,000 recipes, it seeks to go a bit beyond the humble bacon and egg breakfast. Perhaps, a different approach might yield interesting stuff. I try just typing "bacon" into the search field. There are well over a hundred hits. One of the first of these is a section on "The Basics of Cooking Bacon". That might yield interesting results. I'd certainly learn something interesting about one of my favourite foods. Proceeding further, we come across bacon as an ingredient in many different recipes. While I didn't go through these exhaustively, I didn't come across any nifty alterations to my cherished breakfast. Perhaps, searching for "eggs" or "breakfast" would turn up something interesting. Certainly worth a look.

Other cookbooks may yield recipes more quickly. This one is geared towards teaching about how to cook different foods more than being a searchable repository of recipes. People need to think of these cookbooks differently than they think of

searching the web. They are more about cooking technique, theory, and advice than about collecting recipes.

Exploring Cookbooks Using the Kindle App

The Kindle app approaches displaying and navigating books quite differently. The book takes up the entire screen once opened. To search a book's text or access the navigation menu, simply double tap on the text of the book with one finger. Flick right to go through the options of this main menu. Double tap on Search to look for words similar to the search method shown in the Apple Books section. Double tap on the Navigation Drawer, and the table of contents is all right there. Just flick right through the options and double tap on the part of the book that interests you. The book text will appear, and you just flick down with two fingers to begin continuous reading.

Decisions made by publishers concerning how to make their cookbooks easy to navigate can have tremendous consequences for prospective blind readers. In the preceding example using the Books app, we saw that it was somewhat challenging to actually find out about and get at a certain recipe. While I would maintain the book is fully accessible and useable, it wasn't as easy as it could have been. Users of *How to Cook Everything* will need to spend more time becoming familiar with the book and what's in it before using it when time is of the essence. That

isn't the fault of Apple Books as much as it is the book crafters who put it together. I have the same edition of *How to Cook Everything* for Kindle. Unlike the Books app, things are less cluttered in the Kindle app. Since the book takes up the whole screen, it's impossible to accidentally touch anything but the book text. exploring the list of recipes seems far less difficult. When you reach the last link in a page, the cursor doesn't rap around to the top like in the Books app. I prefer things this way when it comes to exploring a link list on a page. If it won't continue over page boundaries, better that one have a clear sense of top and bottom. Scrolling between pages is much faster and feeling around the screen for recipes rather than going link by link is a bit easier. Had headings been implemented, it would have been easier to get to things like the start of recipes in a particular chapter. Overall, I think *How to Cook Everything* really ought to be made into a DAISY audiobook. This would allow for such measures to be taken and make the book easier to quickly jump around in. This book is yet another example of the economic advantage of going Kindle. I bought the Kindle edition of this book when it was on sale for \$2.99 Canadian. Broadening your horizons and learning to browse the web can really pay off.

That takes care of basic navigation of a Kindle book. Now, we'll go beyond that and attempt to put an actual cookbook to use like we did with the Apple Books app. For this demonstration, I decided to obtain *The New Essentials Cookbook: A Modern Guide to Better Cooking* by America's Test Kitchen. It's quite a bit smaller, coming in at 496 pages and 200 recipes. As with *How to Cook Everything*, this cookbook seeks to teach cooking basics and techniques as well as provide a good collection of recipes. At the time of purchase, the price was \$7.99 Canadian. I stumbled onto this one and the description seemed to fit the bill. A modern cookbook that tries to teach cooking basics and has recipes for everyone.

This far less expensive Kindle cookbook turns out to be as accessible as one could hope for from an ebook. *The New Essentials Cookbook* has links to all recipes in each section right at the start of the section. Therefore, you can use the Navigation Drawer to go to a section of interest and immediately turn your rotor to Links, flicking down to go through links to all breakfast recipes in the book. Double tapping a link takes you right to the start of that recipe. It doesn't get better than that. Let's take a closer look:

How to Find Recipes Using the Kindle App

Suppose my wife and I are planning a dinner with a few friends. We plan to have this dinner after we order a batch of groceries, so we'll have an opportunity to obtain any ingredients we might need. All of us enjoy chicken so that seems like a good anchor for this browsing. We're thinking of something that is a bit more involved to make than what we'd do ordinarily.

1. I double tap the book's text and bring up the menu. Flicking right, I find the Navigation Drawer and double tap that. Next, I flick right to get a sense of what sections are in the book. Pretty soon, I arrive at "Dinner At A Glance". That sounds promising. I double tap on that, which takes me to the start of the section.
2. I begin reading by flicking down with two fingers. I learn that this list contains all of the main dishes in the book listed by category. Sounds perfect. I quickly run into the start of the list of links and discover that pasta comes first.
3. I've never cared for pasta so I swipe left with three fingers to skip forward over a page. I let it read down a bunch of links and hear chicken dishes begin to dominate. That's what I'm after.
4. I turn the rotor to Links and flick down to browse more carefully. I double tap on links that interest me and read through the recipes. When I want to get back to the list, I go into the navigation menu and return to the "Dinner At A Glance" section. I could use the Bookmark feature to put a bookmark just before the recipe I'm thinking of looking at so I can return more precisely to the point I reached on the list.
5. Lime Ginger Chicken and Rice with EDAMAME and SHIITAKES sounds delightful. I read over the recipe to familiarize myself with it and then make certain I return to the beginning of it so that I can get at the parts I need. The Kindle app doesn't quite trust its readers enough to let you use standard copy and paste capabilities. You would therefore need to use Kindle's somewhat unwieldy system to highlight and copy a recipe into another app. The same sort of restriction applies to the Books app.

Reading DAISY Cookbooks with the Dolphin EasyReader App

With a DAISY-formatted book, be it audio or text or both, all accessibility concerns have been thought through. This makes the material as accessible to non-visual readers as humanly

possible. Pictures are described. Charts and tables are read in a way that's easy to follow. Any accessibility problems will have been thought through and addressed if at all possible. The multiple levels of headings allow for easy and quick exploration. Apps like Dolphin EasyReader and Voice Dream Reader can read these DAISY format books.

Until recently, people would have to wait quite a long time and hope that their accessible digital library chose to produce a requested book in DAISY format. Only a fraction of the total books out there are available in this format. However, recent treaties have been agreed to that should drastically improve the selection in the English-speaking countries who are signatories. Publishers are now more willing to provide access to resources such as already-recorded audiobook narration. This should further increase book selection and modernity.

For this demonstration, I obtained the *Complete Canadian Living Cookbook* by Elisabeth Baird. It contains 350 recipes as well as lots of nutrition information and cooking advice. The book is around 350 MB in size. DAISY books contain recorded audio, so they're larger than ebooks. DAISY textbooks also contain the text of the book that can be read by VoiceOver using either synthetic speech or a Braille display. At the very least, DAISY audiobooks will contain text headings in a multilevel

structure that allows the reader to quickly browse and jump to sections of interest.

Conclusion

For me, this new ability to tap into digital libraries and make use of the same commercial sources of ebooks available to the general population has been one of the most astonishing and liberating expansions of capability I've ever experienced. I hope what I've written here helps others to become more liberated in their reading as I have. Even on a fixed income, it's possible to enjoy what your friends and family are reading at the same time. Over time, you can build a staggeringly large collection and have it with you wherever you happen to be. Pick your moments and keep a sharp ear out for sales. There are doubtless many sources I have remained unaware of. Those that I've covered above have kept me well supplied with books. May they serve you well also.

Treasures: Some of My Favourite Ebooks and Audiobooks

I've already gone over the best book sources and apps. Below, I'll let you in on some of my absolute favourite authors and books.

Charles de Lint

I was first introduced to this author through a book called *Spirits in the Wires*. It was read by a pair of splendid

volunteer narrators and made available on the CELA Digital Library. In the modern city of Newford, strange things are happening to the Internet. Strange supernatural things. People are appearing in the city who have memories of past lives that never happened. Other supernatural beings inhabit the city, and it falls to a group of people drawn together by these odd circumstances to avert disaster. I'll never forget how drawn into the story I felt while listening to this book.

Charles writes absolutely excellent urban fantasy where myth and magic come up against modern day life. These books are written for young adults and deal with some very serious issues. However, he still manages to pack an astounding amount of humanity, hope, and wonder into his stories. You can get most of his books on Kindle. On Audible, pickings are more scarce. However, I would direct you to *Dreams Underfoot*. It's a splendid collection of short stories narrated by Kate Reading. It's available in other ebook formats too. Another collection of short stories called *The Very Best of Charles de Lint* would also serve as an excellent starting place. You can't really go wrong with Charles de Lint.

Robert J. Sawyer

Rob writes optimistic science fiction of the highest caliber. I can't remember whether my first introduction to his

work was *Starplex* or *Calculating God*. Both would make excellent first reads from him. *Starplex* is set in the far future and is something akin to Star Trek. It's my favourite of his far future books and concerns a science exploration ship that gets caught up in galactic politics. It explores all kinds of substantial issues including love, long life, and time itself. Mark Boyett narrates this book for Audible, and there's an introduction read by Robert J. Sawyer himself. I'll take that any day you like over an autograph I can't see.

Calculating God is another all-time favourite. It is set in the present day as aliens arrive at the Royal Ontario Museum. They come with proof of God's existence in the form of evidence that extinction level events seem to have been managed, happening simultaneously on worlds with intelligent life separated by lightyears. Questions of faith, family, science, and mortality are all artfully considered in this excellent novel. It's available in all kinds of formats. The Audible narration is done by Jonathan Davis with an introduction read by Robert J. Sawyer. Other recommendations include *Space*, *Earth*, and *Time*. These recently published collections of his short stories are available on Kindle, among other places, and are very affordably priced. He also does tremendously good trilogies. In particular, check out the *WWW Trilogy* that

features a blind heroine. Audible uses a cast of narrators. Alternatively, you can obtain the trilogy as a single ebook on Kindle or other ebook formats. I eagerly await his next novel, which commemorates the 75th anniversary of the dropping of the first atomic bomb. *The Oppenheimer Alternative* posits an alternate history where scientists involved in the creation of the atomic bomb attempt to find redemption for what they have unleashed on the world. Whatever this entails, I have no doubt that Robert J. Sawyer will deliver a novel that is true to the real life characters he depicts and contains his trademark thoughtfulness and optimism.

Mark Miodownik

As a boy, he was stabbed with a razor blade while running away from a robber. Amazed how such a thin small blade could go through a leather jacket and injure him, he grew up to become a materials scientist. he has hosted a documentary on Netflix called *Everyday Miracles* that is well worth hearing. He has also written two fascinating books about the materials that so fascinate him.

Stuff Matters and *Liquid Rules* are both full of insights and explanations about why and how we use various materials. I have yet to encounter a more engaging author in this area of expertise. Both books are as entertaining as they are

informative. Michael Page narrates them beautifully for Audible. They are also available on Kindle and Apple Books.

Books About Game Design

I have long been interested in how games work and the thought that goes into creating them. Until perhaps ten or fifteen years ago, it was nearly impossible to find any books on this topic that were accessible to blind people. Game design books don't tend to be bestsellers. Not everyone wants to look behind the curtain of their fun. These days, a great many books about game design are available as ebooks. There are even a few audiobooks either produced by Kickstarter campaigns or narrated for Audible.

The VitalSource Bookshelf app was designed for everyone, but attention was paid to making the app and textbooks that use it accessible to blind people. You can get these books from CRC Press. While saving up for university courses is beyond the means of many blind people, saving up for a few textbooks on subjects of particular interest is possible. A few favourites from this source are:

The Art of Game Design: A Book of Lenses by Jesse Schell. This book offers over a hundred aspects of game creation as lenses through which to view the game you're working on. It is very approachable and useful to a beginning game designer. Even

people who have a casual interest in such matters will find this book easy to follow and a delight to read.

Making Deep Games by Doris C. Rusch. This book explores what it takes to design a meaningful game containing choices that truly matter to players. If you're interested in making a game whose impact is felt beyond the experience itself, this book will help you do that. Again, even if your interest in games is only casual, this book will be easy to follow and provide plenty of food for thought.

Coming down from textbook level, you can find plenty of books to help with game design on Kindle or Apple Books. For a good set of starting books, type "Kobold Guide" into the search box in Apple Books or while in the Kindle Books category of the Amazon site. These books contain advice and thinking from some of the best minds in the business of game design. It's all written to be easy to approach even for newcomers to this area of interest.

Robert van Gulik

This Dutch diplomat left an indelible mark on my teenage reading life with his stories about a 7th century Chinese magistrate known as Judge Dee. Although the stories in van Gulik's books are fictional, they are based upon a real historical figure noted for his ability to solve crimes in

ancient China. Judge Dee is as widely known in China as Sherlock Holmes is in the western world. My parents borrowed a copy of the book *Judge Dee at Work* from our local public library. It was narrated onto cassette tapes by Frank Muller. He did a masterful job reading the eight stories in a very engaging way. Although the stories were somewhat modified to make them more suitable to western audiences, they are still markedly different from other mysteries. Van Gulik also provides some fascinating insights about differences between Chinese detective story traditions and those of the west.

I was happy to find that the many Judge Dee books written by van Gulik are available on Apple Books and Kindle. It's hard to go wrong with any of the Judge Dee books. They're all well worth picking up but be certain to find the cheaper versions. The books have been published with better illustrations, which are useless to totally blind readers.

Simon Winchester

This man has travelled widely and written about all sorts of fascinating places. He also narrates his own books and does so exquisitely well. he has written about the Atlantic and Pacific oceans and of the people and places found in and around them. Most recently, I enjoyed a book he wrote called *The Perfectionists* where he examined how precision engineering has

helped shape our modern life. Another area he has written extensively about is the creation of the Oxford English dictionary. Any lover of words and human endeavour will deeply appreciate his books on the subject.

Larry Niven and Steven Barnes

These two authors have often collaborated on wonderful science fiction stories. The Dream Park series was first mentioned to me by a friend in secondary school who knew of my interest in games and technology. My father read the first of the books, *Dream Park* aloud to me. At the time, none were available in accessible format. Set in a future California ravaged by a massive earthquake, *Dream Park* blends live action adventure roleplaying games with science fiction and a murder mystery. The stories are told from the perspective of the security chief at Dream Park as he tries to keep everyone safe and solve crimes.

I was thrilled when I could finally purchase all four books in the Dream Park series from Audible narrated by Stefan Rudnicki. These copies don't seem to be available in the Canadian Audible store. However, the books are available narrated by the equally skillful Grover Gardener. The series really hits its peak in the third book, which is called *The*

California Voodoo Game. However, all four books are very much worth reading. They are all available on Apple Books and Kindle.

Stephen King

I love a good spooky tale, and few can match what Stephen King has accomplished in this area. His books have been a part of my reading life from teenage years onward. He often narrates his own books, which are available on Audible. If Mr. King isn't reading one of his books himself, you can bet that the narrator who is will be one of the best in the business. A few absolute favourite books of his are *The Green Mile*, *The Stand*, and *Bazaar of Bad Dreams*. All of his books are available on Kindle and Apple Books as ebooks. It's a very good bet that nearly all of his work will be available in your accessible library. He is one of the most popular American authors alive. As I complete this list in early 2020, I must confess that his latest novel, *The Institute*, likely set back the completion of this guide by a few days as I couldn't stop reading it. I keenly await his next collection of novellas called *If It Bleeds* due to be released in May of 2020. By the way, his son, Joe Hill, is no slouch in this department either. His latest collection of short stories is called *Full Throttle*. I found all of the stories to be quite captivating. Audible has an excellent cast of narrators reading

Mr. Hill's stories. This book makes an excellent companion to *Bazaar of Bad Dreams* in ebook or audiobook form.

The Expanse

Written by two different authors under the joint pseudonym of James S. A. Cory, this excellent and thought provoking series of science fiction books is gritty and creepy. It shows an all too realistic portrayal of what sort of societies we might build as we expand into the stars. Full of war, technology, and politics, this series is really a look at human character at its best and worst. I've thoroughly enjoyed all eight books published so far. I still have a number of short novellas to read as well as the soon to be released final book. These books are available as ebooks on Kindle and Apple Books. Audible has them narrated by Jefferson Maze, who does a consistently brilliant job. The only series I can think of that has come anywhere near close to this one in terms of world building was David Brin's Uplift series. An incredible amount of thought went into the universe in which these stories are set and how we might get from where we are today to where the characters find themselves. It's not such a long walk.

Audiobooks About Words and Language

Audible makes a wide range of books available specifically about language and words. Hearing these read aloud is wonderful,

since it eliminates the need to wonder how unusual words are actually pronounced. Many of my audible credits have gone towards books and "Great Courses" about words and language. Here are some of my favourites in this category:

Mark Forsyth has a number of books about unusual words and strange word associations. *The Etymologicon* takes listeners on a ramble through words that are somehow connected with each other. Hours of fun word exploration on tap there. Another great book of his, *The Horologicon*, takes us through a day and lets us hear about words that used to be a part of that day for English speakers but are now unused. I found this book absolutely spellbinding. My wonder at lost words never stopped until the narrator did.

John McWhorter has narrated his own books in addition to a number of Great Courses all about language and how it develops and changes. I particularly enjoyed *Words On The Move*, *Myths and half Truths about Language*, and *Our Magnificent Bastard Tongue*. John is fun to listen to and very knowledgeable without being stuffy about it. You can feel his joy as he teaches about the oddities of English as well as other languages.

Here are a few more wonderful authors and lecturers who have graced my Audible collection. Anne Curzan has done two Great Courses that I'll always keep handy. I deeply enjoyed *The*

Secret Life of Words and *English Grammar Bootcamp*. Both courses are well worth the Audible credit. Her wealth of knowledge is tremendous, and she delivers her lectures with warmth and humour. Gretchen McCulloch recently published a wonderful book called *Because Internet*. This explores how the Internet has changed language and how we communicate with each other. It's a fascinating and funny eight-hour read. Last but not least, consider the delightful author Phil Cousineau. He has written numerous books that are all about language. *Wordcatcher*, *Burning The Midnight Oil*, and *The Painted Word* will all tickle the language lover's fancy. All of these books can be had as ebooks or audiobooks.

Rose George

I well remember hearing this lady interviewed on a radio show called *The Next Chapter*. It was soon after Kindle had made its iPhone app accessible. She spoke of her adventures investigating how all of the stuff in our lives is transported around the world mainly by cargo ship. She decided to find out what life was like for the sailors in that industry. The book was called *Ninety Percent of Everything*, and it's well worth reading. For me, it'll always be additionally special as it was, so far as I can recall, the first time I heard about a book and was able to simply buy it immediately. That in itself was

absolutely magical. The adventures and insights Rose filled the pages with certainly kept me interested.

Spider Robinson

This author of science fiction is as funny as he is thoughtful. One of my most treasured acquisitions from Audible is an audiobook called *The Callahan Chronicals*. As far as I can find, it only exists as an audiobook. Basically, it combines three separate collections of short stories written over twenty years about a bar somewhere in North America. Only people who really need to find it seem to come there. It's a very special place full of crazy characters, puns, wordplay, and barroom philosophy. For those who need adventures filled with delightful puns and wordplay, this book is definitely for you. It's around sixteen hours total and a delight from beginning to end. Audible has other books in the Callahan's Place series that are also well worth hearing. Some of these are also available as ebooks.

Erin Morgenstern

One of my last acquisitions in 2019 was a truly remarkable modern fantasy by this author called *The Starless Sea*. Years ago, I was deeply taken with her previous novel called *The Night Circus*. Erin's second novel completely eclipses her first in every possible way. It's a fantasy crafted for lovers of books and stories. In other words, me. It follows the adventures of a

college student in media studies who discovers a library book that seems to contain a story of his own childhood. Since the book is far older than he is, this should be impossible. There are hints of a magical place just out of reach for most of us where stories come alive. Once, as a child, he walked away from a painted door that looked so real he was afraid to open it. Now, as an adult, he is eager for a second chance to step through. This examination of books, stories, video games, and much else besides is an absolutely spellbinding read. Audible has chosen to have a number of people narrate the book. I most definitely recommend *The Starless Sea* in ebook or audio form.

Health and Fitness: You Can Work It Out

I ran on the spot for my very life. Behind me, a pack of zombies was chasing me as I tried to reach safety in the fictional Abel Township. The game was called Zombies, Run! and it basically combined exercise with audio drama adventure in an attempt to promote better fitness. I had just gotten an Apple Watch and thought I'd take this long-lasting, accessible, and still popular app for another spin. Some years ago, I had used it for a while. My iPhone kept track of my speed and steps using its built-in motion sensors. I was interested to see if the sensors in the Apple Watch that detected my heart rate would change the app's behaviour. Workout data from the Apple Watch and the iPhone is updated and stored in a feature of iOS called HealthKit.

In a nutshell, the HealthKit is Apple's attempt to serve customers interested in improving their health. It is a repository for all kinds of data that comes mainly from third-party apps and wearable devices like Apple Watch or other third-party fitness trackers. There are also many apps that let you track the calories you burn while exercising. There are apps that take your health data into account and help you keep track of the water you drink during the day. Examples include the Zombies, Run! app I mentioned earlier. Those who love snark will

perhaps find the CARROT Fit app to be a pleasantly sadistic workout coach. These apps can track data and interface with the Health app on your iOS device. Diet apps such as MyFitnessPal can help you keep track of and determine how many calories you're consuming. Other apps help you keep hydrated, taking account of the water you drink.

All of this adds to the data stored in the Health app. This is your main interface with the HealthKit component of iOS. This data can, in turn, be used to motivate and advise you in matters of exercise and health. It is also used to store medical data. Apps developed by health researchers allow that data to be collected anonymously and used for large scale studies.

If you have an iPhone or iPad, it will have an accelerometer allowing it to sense motion. This allows for counting steps taken as you walk or run. However, to really get the most out of HealthKit's abilities requires an Apple Watch or other somewhat cheaper fitness tracker accessory. There are some kinds of exercise equipment that can interface with your iOS device, allowing you to control them in an accessible manner. Data generated by these machines is integrated into HealthKit.

When it comes to health and personal medical data, things can get complicated. Just because something is possible, that doesn't always mean that you'll be able to take advantage of it.

Medical regulations in various countries can result in features being blocked and unavailable unless they are approved. A recent example of this is the ECG capability found in the Series 5 Apple Watch. Initially, this ability to perform an ECG was present in the watch hardware and software but blocked for users in Canada. It only later became useable once medical approval had been obtained. Similarly, the ability to participate in medical research programs that collect data via HealthKit will also be specific to various countries.

The Health App

This is your interface to all of the information stored and collected in HealthKit. You are also able to input data into the Health app. At the top left of the screen, you'll find a Profile button. This lets you input medical information and also lets you access settings to control which apps have access to this data. You are also able to inform HealthKit that you use a wheelchair, which changes how motion is counted during workouts.

The Health app is the main place where you can interact with all data related to your health. It has two tabs on the bottom. The first tab is called Summary. It is meant to be a kind of dashboard where you can keep track of the health data that is most important to you. At the top of the tab, you'll find an Edit button. Double tapping this will take you to an

area where you can turn on or off different aspects of health data, thereby adding or removing them from the contents of the summary. You can read any data in the summary and double tap on any Show All buttons to expand what is there.

At the bottom of the Summary tab, you'll find a heading called Get More From Health. Underneath this heading, you'll find articles and apps related to health that may be of interest. I read one having to do with hearing loss as I actually have moderate hearing loss and use hearing aids. Keep in mind that the recommended apps and articles may be older. This is certainly the case with Apple's article containing apps that work well with VoiceOver. Curation could certainly do with more frequent upkeep on Apple's part.

The Browse tab contains all of the health data organized into health categories. There's a search field at the top, so you can find what you need without having to drill down. Otherwise, each category of information has a button. Double tap it to go into that category. Any information will be available. Also, you'll find a button to add data. Most often, data will be added via apps or equipment like an Apple Watch.

When you first run the Health app, you will be asked to enter information to complete a health profile. You will also be given an opportunity to create a medical ID that can contain

information important for first responders or other health professionals who might need to treat you. This information is made available to first responders in a manner accessible from the Emergency SOS Dialer without needing to know your passcode. If you choose not to set this up right away, you can always do so from the Settings app in the Health section. There, you will also find settings that let you manage which apps and devices can access your health data.

Apple takes your privacy very seriously, and you can always change your mind about letting an app or exercise equipment access your health data. Should you wish to share the information with medical professionals like your doctor, it is possible to export the information.

Rumour has it that Apple is working on creating its own fitness app that will tie into the Health app. It will apparently contain workout videos. Beyond that, details are pretty sketchy. However, given Apple's track record with accessibility, this would be a welcome addition to iOS for blind people trying to keep fit.

Thoughts on the Apple Watch

My wife Sara and I have each invested in an Apple Watch. Having taken the plunge far earlier than your somewhat sedentary

author, she has gotten plenty of use out of hers over the years that it has lasted.

Wearable devices like an Apple Watch contain more capabilities such as the ability to measure your heart rate via optical or electrical sensors against your wrist. These additional sensors can let the Health app know about more precise information. More capabilities are constantly emerging. A recent addition lets your watch measure the audio levels in your environment and warn you if there's a dangerous level of noise.

Some Accessible Health Apps

There are thousands of apps that take advantage of your iOS devices data storage and computational capabilities. Apple is apparently working on a workout app for iOS 14 that will, in all likelihood, be accessible for blind users. Given current dismal accessibility odds for health apps in the app store, I'm happy to have come across this widely held rumour and hope it pans out. With third-party apps, even when they're made by the same people, you take a chance that you'll end up with something completely inaccessible for VoiceOver users. This is even the case with the other apps made by developers of the superbly accessible Zombies, Run!. On the other hand, CARROT Fit and CARROT Hunger are both perfectly accessible.

Beyond apps, you can find plenty of workout videos on the web. One especially useful collection of audio workouts can be found at www.blindalive.com. These are available as MP3 files that you can load into an app such as Voice Dream Reader and play the workout following the instructions. Even the first level cardio workout can tucker me out. I dread trying the Bootcamp workout. Full audio and text descriptions of the exercises are also included. Unfortunately, the business that produced these workouts was ultimately unsustainable. The workouts were, therefore, made free for anybody to download.

On Safari: Browsing the Web Using the Browser in iOS

The Internet hasn't changed. However, it can certainly feel different to beginners who aren't used to surfing the web on a flat touchscreen. It will likely feel complicated and clunky at first if you aren't used to VoiceOver gestures. Let's break that down a bit. Part of the slow awkward feel you'll initially have is typing on a flat screen, which is never going to feel altogether not clunky. However, there's always dictation available whenever a virtual keyboard is used. Find the Dictate button or invoke Siri and tell it to type something for you. However, once you're at the right web address, there isn't usually all that much need for a lot of typing.

The real key to competent speedy web browsing on your iOS device is being familiar with VoiceOver gestures and concepts. Once you understand VoiceOver and have a basic familiarity with the gestures, things suddenly become very intuitive and simple. That flat surface and set of gestures changes with practice from different to absolutely delightful. These days, when I need to browse the web on a computer rather than my iPhone, the keyboard and screen reader I once thought represented the best in accessibility feels alien and clunky. I now do all important web transactions including online shopping, downloading content, and

much more almost exclusively on my iPhone. It feels safer and more natural to me now.

Things have advanced to the point where even very complex forms on websites can be dealt with effectively using VoiceOver. I've been able to fill out census forms online without difficulty. Shopping, borrowing books from a digital library, and even participating in games played using a web browser are all perfectly possible using VoiceOver and your browser of choice.

The rotor is especially useful for quickly getting around websites. It is perhaps the most vital set of gestures to be proficient in using when it comes to browsing the web. Using the rotor makes it possible to quickly navigate between headings, links, form controls, and fields, etc. That plus the good old double tap will take you very far, indeed.

For this guide, I'll focus on the Safari browser, which is included in iOS. It is the easiest to learn. You can find settings for it in the Settings app. I'll cover what a lot of them do in this section. Safari is by no means your only choice of browser on iOS. The Firefox and Chrome browsers are also available and there are likely even more choices in the app store. Other browsers typically have menu buttons and have settings reachable within the browser or in the Settings app.

All three of these are free, popular, and fully accessible with VoiceOver. You can have more than one browser. However, Safari will always remain the default browser. To open sites in other browsers, you can copy and paste links or use the double tap and hold gesture on a link in a tweet or wherever it is encountered.

Why It's Worth Learning

Perhaps, this is your very first time having a device that lets you go online. In that case, there's a whole lot of brand new territory awaiting you. Having an accessible means of accessing the Internet in my pocket has been so very liberating and useful beyond my ability to convey with words. I've been using the Internet for far longer than I've owned an iPhone. It has simply become an indispensable part of everyday life for me. Websites are set up by all kinds of organizations, businesses, enthusiasts, and individuals. You'll find journals called blogs about all manner of subjects. There are city and community websites that let you know what's happening where you live. These days, a whole lot happens online. Accessing the web is becoming more of a necessity than a luxury. It's how we keep in touch with people. From government services being easily accessed online, to shopping for accessible gear that isn't found in local stores, the possibilities of what you can do are endless once you're on the web. It is a world where blind people

can leverage their knowledge and access technology to do quite a lot for themselves and others. There are all sorts of compelling reasons to learn how to browse the web.

Perhaps, you're a long-time veteran of the Internet through a laptop or desktop computer. You're experienced, comfortable, and proficient on your computer with your preferred screen reader. In that case, the question to address is why you should bother learning to do things using an iOS device rather than simply doing everything with your computer. Portability is the very compelling answer to that question. Even before the mobile browsing experience was anywhere near as polished as the past decade of development has made it, millions of people jumped onboard due to the sheer convenience. People can keep in touch with their social circles, put holds on library books, shop for groceries, do banking, and settle arguments using a device they can keep in a pocket and hold in one hand. To be able to pull your iPhone or iPod from your pocket and shop or find information while standing on a sidewalk is a massive draw for blind and sighted people alike. Your web browser is a very empowering tool. It is the gateway in Apple's walled garden, letting you safely and privately explore the wider Internet world from wherever you might happen to be.

For me, this capability has come into play countless times over the decade I've owned an iPhone. I've been able to check for the latest news from the many websites that cater to my particular interests while in a car or in bed. I've enjoyed having the ability to read menus of restaurants posted online more often than not. This has let me forego having my sighted companions or restaurant staff read the menu. The same kind of thing holds true for knowing what's available or possible in various places I go to. When sighted people are on the clock and in a rush, you often don't find out things while shopping or accessing places with their assistance. With the best of intentions, they limit what they tell you about in the interests of saving time. Not so for websites. They are patient purveyors of all sorts of handy information that is, for the most part, kept up to date. A website doesn't care if you take your time and explore at your own pace.

The Address Area

We begin our exploration of the Safari screen at the very top. Just below the status bar with the time, connectivity, battery level, etc., you will find the address area. In the middle of this strip is the address field, which displays the current web address of the tab you're in. Double tapping it puts you in an edit mode where you can enter a new address to go to.

When finished typing in the address, hitting the Go button in the bottom right of the keyboard will take you there. This is how you directly drive around the web. To clear the current contents of this address field, flick right, and you'll come to a Clear Text button. Double tap that and you'll be back in the edit field that is now empty and waiting for a new address. Alternatively, you can type a search term into this edit field. When you then use the Go button, a search for the terms you entered into the edit field will be made using whichever search engine has been set as the default.

To the left of the address field is a button called Format Options. This button gives you access to a number of options that may be of use. Low-vision users can alter the scale of the website. You can also choose between the full desktop version of the site or the one designed for mobile phones and tablets. There are occasions where the full site is better and times when the lack of clutter offered by the mobile version of a site is preferable. Another important option is called The Reader. This is a mode that simplifies a website for easier reading, removing any clutter. For instance, on a site with an article, it will make it easier to read the article by removing ads, forms, and other cluttering elements. When done reading, hit the button again to deactivate the reader and regain access to all elements

of a site. This is a very useful tool particularly while you're still mastering VoiceOver.

To the right of the address field is the Reload button. Double tapping this will reload a page that may not have loaded correctly. It will also stop a page from loading, letting you then enter a new address or search terms in the address field.

The Bottom Navigation Bar

This strip across the bottom of the screen has five buttons. From left to right, they are Back, Forward, Share, Show Bookmarks, and TABS. The Back and Forward buttons are used to flip through recently browsed pages you've opened in the same tab. Perhaps, you've started at a search engine and moved onto a page that was the result of your search. You could then use the Back button to go back to the search page to go to another result.

The Share button lets you share contents found on the web with others or with other apps able to use the content. This lets you email links to friends or tweet links to articles, for example. double tap the Share button to bring up the "share sheet", which has a wide array of options to facilitate this. Be certain to double tap on the More button in the share sheet if you don't find the option you want on the initial sheet. The

More button is where you find most options related to sharing content using other apps rather than to specific contacts.

The Show Bookmarks button brings up sites you have bookmarked as well as preinstalled bookmarks. Double tapping on a bookmark takes you to that site. One included bookmark is the user guide for your device available as a web page. You can also obtain the guide in Apple Books if you're more comfortable reading it in that app. In Safari, use the Back and Forward buttons to help navigate the guide.

The Tabs button lets you switch between sights you have opened in separate tabs. You can have as many tabs open as you like. You may want to do this to shop for a product on one site while reading reviews about it elsewhere on the web. However, to move between tabs, you need to use the Tabs button in the bottom right corner. This opens up a tab management window. This is where you can switch between tabs, close unwanted tabs, and open new tabs for additional sites to be at the ready. If you double tap and hold the Tabs button, an option will come up allowing you to close all currently open tabs. Flicking right will present other possibilities in the area of tab management.

Browsing a Site

Between the address area at the top and the navigation bar at the bottom, you will find the main screen area where website

content is displayed. You can flick through the contents with left and right flicks. You can also feel around and get a sense of where things are on the page. Both of these methods are helpful at times but would be tediously cumbersome and slow if used exclusively. By far, the best way to navigate is through use of the rotor. You can turn the rotor to settings for Headings, Links, Form Controls, etc., and then flick up and down to quickly get to the next or previous instance of what the rotor is set to. Flicking left or right will still move you by character, word, or line, allowing for easy reading of text on a website. The Rows setting is useful when dealing with tables. While in a table, set the rotor to Rows and flick up or down to move to the previous and next row without changing the column you're in. Flicking left or right moves you between columns. In the VoiceOver settings, you can add or remove things from the rotor so that it best suits your style of navigation. Many VoiceOver settings have an effect on the web browsing experience.

Form Controls

To use a "form control", double tap on it to let VoiceOver know to focus on that control. You can then type information or alter the value of combo boxes or sliders, check or uncheck boxes, etc. Simply flicking right or touching the screen outside

the form controls will get you out of the edit mode. There's usually a button called Submit, OK, or Done that should be double tapped to complete the use of form controls when finished filling out a form. Often, hitting the Go or Return key will have this effect. Most form controls are read in such a way that you know what information a field requires or what a control such as a combo box, slider, or checkbox pertains to without leaving the mode where the focus is. However, touching outside the form will sometimes be helpful in determining this.

The Download Manager

Rather than always downloading files into specific apps, you can also now simply download files to a folder on your iOS device or in iCloud for later use. You can do this without having to use the share sheet and finding the Save to Files option. This process just got a whole lot easier in iOS 13 thanks to the new download manager added to Safari. For people like me who take full advantage of digital goods, this is fantastic. I can now download ebooks I purchase directly into my iCloud for safekeeping and then move them to files or open them into apps later.

For our purpose, we'll use a video created by Apple to demonstrate the accessibility features built into its products. The video is around 90 MB in size and plays for around a minute.

If you have the setting for audio description turned on, all of the action will be described. It's a pretty powerful minute and well worth listening to. To find this video, go to www.apple.com/accessibility.

Next, browse the page and find the heading that reads: "Technology is Most Powerful When It Empowers Everyone." Directly beneath this heading, you'll find a button labelled Play the Accessibility Overview Film. Normally, you would simply double tap on this to stream the video. However, let's say you want to show it to a friend of yours who lives in a cabin in the woods. There's no Internet access out there, so you'll have to bring the video to your friend on your device. By default, files will be downloaded into a Downloads folder created automatically on your iCloud drive. You can access this folder in the Files app. However, we need to change that location to get the video onto your device. This is done in the Settings app. Go into the Safari section of settings and over to Downloads. It will most likely say Downloads iCloud Drive. Double tap this and flick right until you reach On My iPhone or whatever your device is. Double tap this. There's much more to be found in Safari settings, and we'll be back there later in this section for a longer stay.

for now, though, go back into Safari. Instead of double tapping on the video, do a single finger triple tap. This brings up the "context menu". A handy thing to do in all kinds of places. Flick right through the options until you get to Download Linked File and double tap this. A new icon will appear by the address bar showing the progress of the download. Once it has completed, this icon will simply say "Downloads". You can now go into the Files app and browse in the On My iPhone or appropriate device name. Expand that location by double tapping on it and then flick right to explore the contents. You'll find the video waiting for you there. Now, you can play it even without an Internet connection.

For most circumstances, having your files download to your iCloud Drive will serve just as well. However, if you only have 5 GB of iCloud space, you may prefer to have files go directly onto your device. In that case, I suggest creating a new folder for such downloads on your device and then making it the default download location in Safari settings.

Safari Settings

Safari has a large number of settings that are divided into groups using headings. Turn the rotor to Headings, and you can quickly flick up or down between groups of settings to get to what you want to change. We won't cover these settings

exhaustively. However, we'll touch on any that can be especially helpful to blind people. For a more complete discussion, please refer to the user guide for your specific device.

Search Settings

A lot of what people do on the Internet involves searching. The very first setting under this group is a pretty easy one to comprehend. It lets you choose your search engine. The default is Google. It has certainly done well by me. However, there are other options. double tapping on this setting will let you choose a different default engine for your inquiries. The next two settings let you turn on or off automatic suggestions from your search engine and Safari itself.

The Quick Website Search lets you type in a short name of a website into the navigation bar followed by the term or terms you wish to search a particular site for. This may prove convenient. Personally, I just go to whatever site I need information from and search there.

The Preload Top Hit setting would cause any site that came up first in a search to automatically load and be shown. This would save you clicking on that link to visit that particular result. Just keep in mind that the top result isn't always the best result for you. It can often pay to look at other results before leaping.

General Safari Settings

This group contains around five settings. They begin with Autofill, which is the ability to have login information such as passwords and account names automatically filled in for you once you verify who you are. For example, instead of typing in your email and a long password, you could simply double tap an option that appears when a site loads that says "use Michael Feir" or whatever your account name happens to be. Double tapping on this will then prompt your device to ask you to look at it if using Face ID or touch the Home button if using Touch ID. You could also use a passcode. The information would be filled in and you would then simply double tap on the Sign In button or whatever the name of it is on that particular site.

The Frequently Visited Sites setting will keep track of the sites you visit often. Instead of having to type their name in the navigation bar, you could find and double tap the site in a list that pops up when you activate the navigation bar. This can save a lot of taps over the course of a day.

The Block Popups setting does what its name suggests. Many sites feature content including ads that pop up and eclipse the actual site. This option keeps that from happening. This is preferable most of the time. However, there are instances when a good thing such as a checkout window letting you pay for content

or a video you want to see is supposed to pop up. In such cases, you can exclude sites from being blocked. This, therefore, isn't an all-or-nothing choice.

Another key setting in this area lets you set where content you download from the Internet gets stored. It defaults to a directory in iCloud Drive. However, you are able to change this if you wish. You can also change when or if files you download are removed from the list of recently downloaded files. The default is set for one day after you download them.

Tabs

These settings allow you to configure what Safari does regarding tabs. A tab is a place containing an open website. You may want to have several tabs open for sites you visit frequently. Alternatively, you might just use one tab and forget about others you've left open. These settings in this group let you choose to open sites in the same tab you're already in or open a new tab when a link leads to a new site. You can choose when you want tabs to close or else take care of that yourself. Settings in this area are very straightforward.

Privacy and Security

These settings can help make your explorations online safer. The first setting lets you prevent websites from tracking you after you leave. The next lets you choose to block all

cookies. Cookies are tiny files that sites save to your device to keep track of things. Not all cookies are harmful. Some will speed up things like online shopping or keep track of frequently entered information. However, others will allow advertisers to target you with ads about various products and services. Usually, websites will explain what they do with cookies so you can decide whether your interests are served. As with popups, the Block All Cookies isn't an all-or-nothing choice. You can have exceptions either way.

Another nice addition is a Fraudulent Website Warning. This will alert you to sites that may be unsafe. You can still visit them, but this will at least warn you if it's a known bad site.

The Check for APPLE Pay setting will let websites know that you have Apple Pay. You can then use this convenient and secure method of payment if you wish. This can speed up online shopping.

Another setting lets you clear your website data and history, which gets rid of any cookies or other data stored on your device. Every so often, this can help get around technical troubles with some sites.

Settings for Websites

The settings here will change what happens when you visit sites. For low-vision users, the Page Zoom setting may be

useful. Another very useful setting is Request Desktop Website. This setting will force any sites you visit to display their full version designed for desktops. These can be much more cluttered than the mobile-friendly versions of sites. However, they often contain options that the more stripped down, clutter-free sites lack. one example of this is when returning books you purchase at Audible. I can't do that on the mobile site and need to go to the full desktop site.

The Reader is a feature of Safari that is designed to declutter a busy website, making the text content easier to read. This setting lets you choose to automatically use the reader on all sites that you visit. I wouldn't recommend this, as some interactive forms and elements you might need may be hidden. However, beginners may find it helpful in exploring various sites.

The Camera, Microphone, and Location settings let you decide whether sites can make use of these capabilities or not. On a social chatting site, you would likely want to be able to use the microphone and camera. Other times, you might want to make certain these capabilities can't be used. These three buttons let you take control of this.

Reading List

These settings let you save any items added to the Safari Reading List automatically to your device so you can view the content offline. It can be helpful if you want to stock up on articles or other information for reading when you'll be off the grid.

At the very end of this group is a button called Advanced. I've never had occasion to use anything in here before writing this section in late 2019. In there, you can manage any website data. You can also choose whether or not to let Java run. Java is a frequently used Internet language letting sites run useful applications. Don't disable this unless you have a good reason. These really are settings most people won't need. A lot of this is clearly for developers. At this point, I'll simply refer you to the user guide and Google and get out of here before doing anything daft.

Further Thoughts on Mobile Web Browsing

Sitting on my couch listening to an afternoon talk show, I was told of a rather important survey. it concerned the rather heavy subject of the right to medically assisted dying. This is a new legal and ethical territory in my country, Canada, and we're still struggling with it. The government put up a survey online to get an idea where the opinions of average Canadians

stood on this issue. As soon as they mentioned the URL or web address of the survey, I went there to check it out. Feeling uncertain what I thought of assisted dying, I didn't feel I had anything to contribute. However, I could have done so easily had that not been the case.

Through the use of the Safari browser, I have done a great many things. I've donated to charity during a critical time period when my donation would be doubled by a philanthropic agency. Hearing about a product while in someone's car, I was able to look up reviews about it and determine that it wasn't something I should get. I've learned about the plots of movies. More than one bet has been settled through use of the Safari browser in my iPhone.

While apps are often the better way to access online things using your iOS device, there are plenty of occasions when the website is more accessible and, therefore, preferable to the app. I tend to use the Amazon site and Safari rather than the Amazon app, mainly because the app doesn't support purchasing Kindle books. Those are by far my most frequent kinds of online purchases.

To really get the hang of mobile browsing, there's no substitute for practice. Try visiting the next website you hear about on the news or in conversation. See what your government

offers in terms of accessible services. There are organizations dedicated to helping blind people or offering accessible goods and services. Try browsing any of their websites. Have some fun out there on the web. To make certain everyone has a good place to start surfing the web, the next section of this guide is dedicated to giving you a tour of one of the most helpful places for beginners to know about. Come along as I show you around AppleVis.

The AppleVis Grand Tour: An Oasis of Community in a Realm of Rapid Change

For blind people who own Apple products, there is a steeper learning curve finding out how to use them competently. That difficulty is further compounded when we go looking for accessible apps. Finding which apps are actually accessible using VoiceOver out of millions available is a harder and often discouraging experience. Apple itself provides almost no guidance in either of these areas that newcomers are at all likely to be aware of.

Out of these conditions, the AppleVis website and online community were founded, as blind early adopters wanted to share their excitement and experience. Over the years, AppleVis has become the central hub where helpful information and friendly knowledgeable advice can be found. Created in 2010, this site has grown tremendously over the past decade. I was fortunate to have this resource to turn to when I began my journey with iOS. I hope that all of my readers choose to share in its many benefits during their own journeys. The preceding section dealt with browsing the web. It seems proper to point people towards a resource that is free to use and suitable to practice your web browsing skills upon. We'll start with a brief overview of what the AppleVis community has to offer as well as some of its

history. After that, we'll delve more deeply into various aspects of the website and community of helpful, friendly users that all of us are invited to be a constructive part of. Keep in mind here that I won't spend time telling you how to do things like post messages. I'll describe what's there and leave it to you to figure things out. The AppleVis site is one of the best and safest places online for new blind users to explore and experiment for themselves.

I first began to drop in on the AppleVis site in late 2010. I had been hearing more stories about these iPhones that could talk and the apps that were being made for them. I found it hard to believe blind people could do so much with something having no physical keys. AppleVis kept coming up in these stories and conversations with other people, so I visited the site to learn more.

Reading the various discussions and guides available at the time was certainly fascinating. However, what really pulled me in was the sense of overall community. I've always admired initiatives that freely offered help to all. I found a real sense of shared discovery and excitement. People wanted to share what they were learning how to do with their iPhones. News was spread very quickly about apps that were found to be accessible

to blind people. I was really attracted to the thriving discussion forum as well as the quickly growing app directory.

The AppleVis podcast feed features contributions from community members as well as from the people in charge of AppleVis. The staff do AppleVis Extra and AppleVis Unleashed podcasts every month. People will find lots of demonstrations of various apps so they can hear how they sound and what they're like to use.

To keep the community going strong, the staff often starts discussion topics or holds special events. These can be a lot of fun to participate in or simply keep tabs on as they unfold. These include polls, awards for particularly accessible or popular apps, birthday celebrations, and more. Also, whenever an operating system update happens, the AppleVis staff check it for any accessibility implications and put up a report very quickly to inform the community of issues and positive improvements they find. I always check for this before I update my iPhone.

All of this is kept thriving and orderly by a small group of volunteers who manage the community and site. Nobody gets paid for what they do. To help pay for upkeep costs, donations are requested. People don't need to donate to make use of the site. It's strictly voluntary. However, doing so in a high

enough amount entitles you to be a member of the AppleVis Club. This has a number of perks.

The AppleVis Home Page

The AppleVis community is pretty lively, and the constantly changing website reflects that. New apps are discovered frequently and added to the app directories. New conversations are started and old ones renewed as opinions and circumstances change. Think of the AppleVis home page as your free and constantly refreshed newspaper. People can easily find out what's new at AppleVis merely by browsing the information beneath the heading that interests them. Diving deeper into a conversation or an app directory entry is no more than a few swipes and a double tap away. Headings such as Latest Posts and Updates, Trending Posts, Latest App Recommendations, etc., keep people oriented. Simply turn your rotor to Headings and quickly flick up or down through the blocks of content.

For beginners, there is a whole dedicated section with guides and tutorials. These are either text or audio and can be very helpful if you're still learning how to do the basics. The heading is the next one down from the Welcome Section. Beneath the heading, you'll find links to material for each kind of Apple product. Double tap on the link that applies to you and then explore that page for useful material.

Below this section, you'll come to the Latest Posts and Updates heading. Right beneath this heading, you'll find a filter option that lets you focus in on specific kinds of updates. Otherwise, you'll find all of the latest postings to the site awaiting you. Each is marked as a heading, so you can easily flick down through them in order. The headings are also links, so if you find something you're interested in finding out about, double tap and you'll be taken there. When you're finished with that entry, use the Back button at the bottom left of the screen to return to the home page. At the bottom of this list, you'll find a View Older Posts heading that also happens to be a link that you can double tap to dig deeper into the past.

The next heading below is Trending Posts. Things aren't quite given as much prominence below this point in the home page. Each conversation is marked by a link that you can double tap. This section is good for catching older conversations that have become reenergized.

Lower down, the next heading is one of my personal favourites. It's called Latest App Recommendations. Under that heading, you'll find links to the latest apps recommended by the AppleVis community. Always worth a quick looking over. Double

tap on a link to be taken directly to the appropriate entry in the app directory.

Farther down the page, you'll find more headings. These include one for the latest accessibility ratings done by the community. Another important stop is where you'll find information about supporting this resource financially if you're able to. All financial donations are voluntary. Everything on the site remains free for anyone to use regardless of whether you have donated.

The App Directories

The app directories are repositories of information about apps that have been tried by AppleVis staff and community members. Blind people hoping to find accessible software for their Apple products will find them a tremendously valuable resource. For readers of this guide, we will be focusing on the iOS directory.

Essentially, the directory is a constantly growing collection of entries that each describe an app. They also allow comments to be made by community users, so they serve as a place where conversation about that app occurs as time passes. They are more structured than blog postings. Think of them more like database entries. They must contain information such as an app's description and category, how accessible or inaccessible an app

is, the developer's name, and any contact information. You'll also find out the iOS version and equipment the app was tested on so that you can put any comments into proper context.

Below an entry are any comments contributed by community members. This allows for people to disagree with information in the entry or offer their experiences with the app. App developers are not allowed to post entries about their own apps. This is to make certain that what people learn about is how community members experience an app rather than what an app developer wants people to think. However, developers can comment on these entries like anybody else who is a community member. You need to be a community member to post an entry to an app directory. Some entries from unregistered users are permitted but only after being manually checked by AppleVis staff. This is to prevent any kind of misuse of the app directory and makes certain there's accountability.

There are many ways to explore the app directories of AppleVis. It is possible to search for app names specifically if people know them. Also, you can browse by particular category such as game, productivity, reference, etc. Apps can be sorted in a number of ways such as by title, date of entry, date of last comment about an entry, and many more ways. This lets

people drill down to the kind of app they need and find out about what people who have tried the app have experienced.

If people disagree with what an entry says about an app, they are encouraged to add to the comments below the app entry and make their feelings known. AppleVis staff will edit entries when appropriate. Original posters of app entries can also edit them. Change is certainly possible and happens fairly frequently as apps are improved, or age without such improvement and become less workable.

Suppose you want to find a good accessible app for writing. You would go to the main menu of AppleVis and choose Apps. You'd then be at the main app directory page. You default to the iOS app directory. You'd then choose to view the Productivity category. Sorting the entries can help minimize what you have to look through, which helps when there are potentially hundreds of apps in a category. By default, apps are sorted in ascending order by title. I don't find this useful. Instead, I use the sorting form to sort by the date an app was last commented on and choose descending order. This puts the apps most recently discussed at the top. Entries have headings, so I turn the rotor to Headings and flick down through the titles. Scrivener and Pages have recently been commented on and sound promising. I can double tap on an app title to focus on its particular entry

rather than the summary displayed under the heading. I can then always use the Back button in my browser to go back to the list and can begin looking at alternatives.

Think of the app directories as where the more formal conclusions of the community about an app are stored. It's a good record of the last time an app was investigated seriously. To prevent abuse, there are understandable safeguards against anybody being able to simply change an app's entry. The forums are where more ongoing and informal discussion takes place. This helps to balance out problems with the app directory approach. If an app isn't being actively commented on in the app directory, you may find out about updates or changes that have taken place since the entry was last modified. Forum discussions often dig deeper into people's experiences with an app. For instance, I might ask in a forum posting whether people have had trouble entering an apostrophe while using Scrivener. I have yet to read of anybody having that issue, but it kept me looking for different apps until I found Ulysses. Often, app developers start or participate in forum discussions about their apps. This helps issues get resolved faster.

On the main apps page, you'll find links that take you to collections of apps specifically designed for blind people. Due to how the app entries are constructed, you need never worry

that what you'll find there will be outdated. The pages are generated on demand. This is useful, as it provides a very safe group of apps for beginners to start their experience with.

I gained a lot from the app directory while I was new to the iOS ecosystem. For one thing, it helped me steer clear of apps that weren't accessible. I very much appreciated that. Also, it allowed me to learn from a blind user's perspective about apps I was considering. This let me make far better choices early on until I became skilled with VoiceOver. The overall positive early experience I had was thanks largely to the AppleVis site and the app directory.

The Discussion Forum

The real heart of the whole AppleVis endeavour are the ever-expanding discussion forums. This is the place where community members come together. People ask for help, offer advice, and share their most recent discoveries. Membership is free and anyone can participate.

When I first looked through the AppleVis site, I found the heading called Latest Posts and Updates. This showed me the most recently active topics of discussion in the forums. I had participated in online communities before, so I realized immediately that this was just the tip of a large iceberg. There are many different forums devoted to major categories of

discussion such as iOS gaming. Within each forum, there are hundreds of discussion topics that potentially have hundreds or thousands of messages. It boggles the mind thinking about how much writing is in there. These discussions stretch back to the very beginning of AppleVis nearly a decade ago. All of it is searchable by anyone.

To get to the forums, find the Main Menu link near the top of the AppleVis site and activate it. This will reveal a menu of links, letting you easily navigate to different areas of AppleVis. Find and activate the Forum link in the menu. Once at the forum page, you'll find everything laid out in a table. Set your rotor to Links or Rows, and you can easily flick up or down to look at each of the forums. The first column shows whether there are any new postings. Next, you'll find the name of the forum and number of posts. The forum names are links, so you can double tap on them to enter that forum. Next, you can browse through the topics within a forum. Each topic is a link, so double tapping on it will let you drill down into that particular discussion. It's all done consistently with links and is very easy to get around. Remember to check for multiple pages. There will be links to get you to those. You'll find multiple pages of topics in every forum, and most discussion

threads have multiple pages. Conversation threads can be long and sprawling things, but postings will generally be on topic.

Anybody can participate in the discussions.

However, before doing so, people need to register with AppleVis and create an account. Once you have an account and are logged in, you can post messages in the forums. AppleVis reserves the right to delete inappropriate content and takes measures to keep things informative and free from abuse. Be polite and you should do fine in the community. Try not to post messages that aren't substantive. They just create more work for the staff. Don't worry about having your head bitten off while you're learning the ropes. People are generally supportive and helpful to newcomers.

Writing messages is quite easy to do. Everything is very accessible, and the message form is easy to write in. Edit fields for subject and message are all clearly labelled and work wonderfully with VoiceOver. There are formatting tools as well that people can use if they wish. When you're finished writing your message, find and double tap on the Save button to post the message.

Things tend to be quite friendly and calm in the forums most of the time. People make an effort to help each other out and love to share new techniques or news about apps they have

discovered to be accessible. Developers of apps have found the community to be helpful and friendly when they seek help making their apps more accessible. However, like any large community, there are flashpoints and arguments. These tend to settle down reasonably quickly and are contained within the threads that the argument starts in. I have yet to see hostility spread beyond a single thread to more widespread trouble. Keep in mind that there are people of all ages participating with varying degrees of life experience. Also, unless one has actually created an app, it can be hard to really have a sense of the effort required. App store economics can be very tight on developers trying to make a living. To varying degrees, members of the AppleVis community are all aware of the plethora of apps and games available to sighted users and want access to the same or similar things. Most of the time, I've found that yearning to be at the root of discontent. This can get especially heated when it seems like an app or game could be made accessible but isn't.

There are guidelines and help for people who wish to participate in the forums. In the main menu, keep flicking right past the Forum option, and you'll eventually get to one called Help. Double tap on this and you'll find a lot of frequently asked questions. These include several related to the forums including guidelines for posting to forums. Double tap on a

question and then flick right to read the answer, which has expanded when you double tapped the question. The help is quite extensive, but you should feel free to contact the AppleVis staff if you're unclear about things.

To keep the community as a whole informed about forum discussions, the latest trending topics are posted on the AppleVis home page. Trending topics are also posted to social media such as Twitter. People can follow AppleVis and will receive updates via Twitter. This makes certain that anybody who might have something to say about a topic can do so.

My experience in the AppleVis forums has been overwhelmingly a positive one. I've been part of many different discussions about accessible games and all kinds of other apps. I remember how thrilled I was when I learned about the BlindSquare GPS app when it came out. There was so much excitement around that as people began using it, reporting what they learned of their real world surroundings. The KNFB Reader app made a tremendous buzz as a group of early adopters tried to convince the rest of us that it was worth the high price compared to other apps. More recently, the Voice Dream Scanner app caused quite a commotion, bringing excellent character recognition to everyone for the price of about two cups of coffee. It's always fun reading people's joyful remarks when

they learn about newly discovered accessible apps or techniques for accomplishing something with VoiceOver. There have also been occasions when I've been able to recommend apps that have helped people in their lives. For me, that is the ultimate pleasure and privilege. Another neat thing that happens quite often is when a thread starts off with a bitter complaint. There was one that criticized the currently available accessible games. I cringed at the thought of app developers reading the initial message about how simple games sucked and how this person wanted games on a par with what sighted people were playing. To some extent, I think a good many of us share this fellow's frustration. However, the disparaging angry way it was expressed made me cringe at the thought of it being what someone who didn't have any contextual awareness stumbled upon. Over time, the discussion sparked by this outburst became a far more mature and thoughtful examination of where we are in that area. There's such a broad base of experience that people who come in complaining and frustrated tend to find answers that clear away their issues or at least raise their level of understanding about the difficulties in solving them. Overall, I love how a positive spirit nearly always prevails in the forums.

A Place for Beginners

To help new owners of Apple products get their bearings, the staff at AppleVis have created a section of their site that collects helpful guides and resources. These tend to be about individual things people might wonder how to do rather than a more complete guide like what you're reading now. For many people, this approach will be precisely what the doctor ordered, and will get you experimenting with your device quickly. On the AppleVis site, look for a heading that says Getting Started With Your First Mac, iPhone, iPad, iPod Touch, Or Apple Watch. Beneath that heading, you'll find both written guides as well as audio tutorials. They tend to be relatively short and focused. This section is added to as new developments in Apple's operating systems occur. Keep in mind that all of this is done by volunteers rather than paid experts. Please keep your expectations reasonable here. Not everyone is brilliant at recording or writing. However, all of the contributions found here were made by knowledgeable people who took time out of their lives to lessen the learning curve for others. I, for one, appreciate this helpful spirit.

AppleVis Podcasts

Often, it can be very useful to have someone describe how to do something while he or she is actually doing it. This lets

people get an idea of how things should sound if done successfully. Reading about an app doesn't always give you a good enough idea of how suitable or interesting it would be for you. To help with this, AppleVis staff and members of the community record audio demos and tutorials. These are published to the AppleVis site as well as to the AppleVis podcast feed. You can type "AppleVis" into your podcast app of choice and automatically receive notifications or actual podcasts as they are posted.

The AppleVis staff do at least two podcasts regularly. These are the AppleVis Extra and AppleVis Unleashed podcasts. They are posted every month. People will also find lots of demonstrations of various apps posted by AppleVis community members. One podcast might be a review of a game. The next might be a step-by-step guide to how to use a feature such as Voice Control. For Club AppleVis members, a special podcast feed contains all materials posted since the very beginning of AppleVis. As many apps still survive to this day from that time, this can be handy every so often.

Community Special Events and Initiatives

Often, the staff of AppleVis puts on special events to keep things active in the community and tap into the tremendous resource of users to advocate for increased accessibility. These

events can take many forms. Often, discussions are started in the blog by staff members to spur comment from users. often, there are voting polls about various things. The most exciting of these are when the Golden Apple awards are handed out each year to apps that are especially accessible and popular. Birthday celebrations and giveaways often occur when the anniversary of AppleVis comes around. Still more interaction is likely to occur as word spreads about this community. The AppleVis staff are always looking for new ways to increase community participation and fun.

Any operating system updates released by Apple are occasions when you'll definitely want to drop into the AppleVis site. Whenever an operating system update happens, the AppleVis staff check it for any accessibility implications and put up a report very quickly to inform the community of issues and positive improvements they find. I always check for this before I update my iPhone to be certain that no major accessibility upsets are introduced that I can't cope with. The staff are few but very knowledgeable and heavy users of Apple products. They will certainly catch anything major. They don't always catch all of the changes introduced. For that kind of thoroughness, wait and watch for comments to appear below the official posting from AppleVis. There are invariably pioneers among community members,

myself included, who plunge in and report about any positive improvements or trouble spots they encounter.

The Main Menu

Don't forget to make use of that Main Menu button. Double tap it and flick right over the options. You'll first find a Submit Content option, letting you do precisely that. Blog entries, forum postings, app reviews, hardware reviews, and much more can be submitted by community members. I hope that some of you will take the time to create an account and contribute your discoveries and expertise to the community. If it weren't for this helpful resource, you wouldn't be reading this guide. If it weren't for people stepping up and volunteering their time and talent, AppleVis would never have lasted.

Other options will transport you to different areas of the site. for instance, there's an option to get to the podcasts, so you can access what's on offer right from the site as opposed to using a podcast app. Another option will take you to the blog where you'll find out about any initiatives or discover new postings for discussion. There is also an option to take you to the app directories. For people needing accessories known to be accessible, there's a Hardware Accessories option, taking you to a growing collection of reviews.

You Can Help

There are all sorts of ways to pitch in and make AppleVis an even better resource. Your participation in forum discussions is one way. Ask those questions you have about how to do things or what the best app for your purposes might be. We were all beginners once. Most often, someone will come up with some sort of answer in a reasonable period of time. I've rarely waited over half a day before answers have begun to appear when I've asked about things. Write a review about an app you've discovered or add your comments about an app already reviewed. They may prove helpful to others. Participate in polls, votes, and other community events. Your opinions count.

While the AppleVis community and resources are free for anybody to use and provided by volunteers, there are still costs involved. These include hosting and bandwidth costs, among others. Your financial donations help keep the site going and continue to provide help to blind users of Apple products. I, for one, will support the AppleVis site for as long as I'm able. I can't give much, but every little bit makes a difference. I hope some of you will choose to contribute regularly and become Club AppleVis members. Regardless of whether you do so, I fervently hope that you'll tap into the extensive resources and thriving community that is AppleVis.

Plunging into the Streams: The TV App and Other Video

Entertainment

These days, more people are watching what they would once have sat in front of a TV to experience on their computers, tablets, or smartphones. Content streaming services like Netflix, Amazon Prime Video, and Disney+ have grown tremendously popular especially over the past five years. The TV, once an essential part of every home, is now increasingly losing its grip in favour of the flexibility and convenience offered by streaming services. For blind users of iOS devices, this is a very welcome and compelling development. Now, instead of having a TV taking up space, you can pull out your iPhone or iPad and listen to your favourite movies or shows anywhere you wish. You can absolutely have large speakers and displays if you prefer, but you could also simply use Bluetooth headphones or the EarPods that come with your iOS device. Screen size doesn't really matter when you can't look at it. Thanks to VoiceOver, everything is quite accessible. Finding out what's available is very easy. Also, most services will offer at least some of their content with described audio, which is easy to turn on or off as desired without sighted assistance.

Even when described audio isn't available for content, there are still benefits to using streaming service apps if

you're blind. For one thing, there's the portability of your device. It doesn't matter how big the screen is if you can't see it anyway. I can pull out my iPhone and AirPods anywhere and fully enjoy shows. I can broadcast content to TVs or speakers that may be present in the area, allowing me to bring the party to other people. Also, there's subtitles. VoiceOver can read those out loud, making it possible to enjoy shows in other languages, hearing the English subtitles. You can also rewind and hear things again that you missed out on the first time. And then, many of these services let you run them in the background while doing other things. This is great for blind people who don't actually watch the screen anyway. You could hear a documentary or educational show and take notes in another app while you listen. You could pause a show and look up words you don't understand right when you hear them.

Some of my readers might wonder what it means to "stream" content such as an episode of a show. Basically, streaming is a way of making content available by having it only be present on your device as it's actually needed. It's not saved permanently onto your device. Services like Netflix don't want you to actually keep copies of what you watch using their platform. They don't have the rights to sell you files of movies and shows. Instead, they have a system that keeps constant track of

your position in a show or movie as you watch the content. Only a tiny fraction of the show or movie is ever actually present on your device. It's only there long enough to be played. This makes it possible to have tremendous amounts of content available, which doesn't take up much storage space on your device. This prevents you from keeping and sharing copies of what is offered. You need to be logged into the service to view content. A high quality movie might be two or three gigabytes, so this isn't just about protecting themselves from theft. A lot of the services including Netflix actually do let you download content for offline watching as long as you're a subscriber and use their app.

For the most part, these services operate by people paying a subscription. You pay a subscription and gain access to their library of content. This typically includes content that has been produced by others such as favourite TV shows and movies. However, subscription revenues also increasingly pay for original content made especially for a particular platform. Netflix, Disney, Apple and Amazon all invest heavily in shows or movies made especially to be viewed on their particular service at least initially.

Not all services operate through subscriptions. There are some exceptions. I would say that YouTube is a streaming

service. You can subscribe to YouTube TV and YouTube Music and access content you otherwise couldn't. However, the bulk of their revenue comes from advertising that they expose viewers to. Also, YouTube lets anybody post content and even pays people revenue if it's very popular. In fashion and blindness circles, Molly Burke is a familiar example of a YouTube content provider. TV channels and national media outlets like CBC and BBC are also increasingly offering the ability to stream content especially to people in the countries they operate in. The CBC has an app for its TV content called CBC Gem and also one for its audio content called CBC Listen. Canadians can watch anything free with ads or subscribe to remove ads and access some extra things like the CBC News channel. However, the bulk of their revenue comes from Canadian taxpayers as well as from advertising.

For the most part, the apps for these services are at least basically accessible to VoiceOver users. However, much like websites, some apps will be easier to use than others. For instance, Apple TV is by far the smoothest experience for blind people. It honours the descriptive audio setting in the Accessibility settings. Once that has been set to "on", audio description will be used whenever possible while in the TV app. Unfortunately, other services don't clue into that setting. In most cases, you need to go into subtitles and audio options

while a show plays and select a track with audio description. After you've done that once, most services remember and will use described audio whenever possible.

Having content audio described is tremendously important to blind people. There are countless occasions where it can be impossible to tell what's happening by sound only. How much content is audio described will depend on which service you're using. Also, it can sometimes depend on which country you're in. I tried watching "American Gods" on Amazon Prime and found that there was no described audio. However, I've read tweets from people in the UK who did have audio description available. Perhaps, they were watching the series on a different service. Alternatively, there are occasions where the described audio is only available in certain countries due to broadcast rights, which streaming services must honour.

Another area where things can differ greatly is when it comes to actually browsing or searching what content is available on a streaming service. Some of them like Apple TV and Netflix are quite easy to explore. Things are organized under headings, and there are buttons to explore different categories. A separate tab lets you search for something you already know the name of. Other apps aren't as polished, and it's obvious that accessibility wasn't part of the thinking process of

developers. I found the Crave and Disney+ apps more difficult when it comes to exploration. You had to flick through everything and couldn't jump around as much. However, on the whole, it's usually very possible to find out what's available and explore for yourself. You use the same skills that you would to browse the web. The better you are at this, the easier you'll find using the websites and apps of streaming services.

Getting Started

There are a few steps to get set up with these services. You'll first want to obtain the app for the service you want to use from the app store. These are free to download, so there's nothing to lose by taking these services for a spin. Creating an account and subscribing to the service will be the first order of business. There is typically a trial period before you will be charged a subscription fee. This lets people look around a service to see if it works well for them and has the kind of content they're after. The only thing is that you need to remember to cancel your subscription before this trial period ends so as not to be charged the regular subscription fee at least once. Pick a time when you actually have some time to invest in experimenting with the app and watching some content. In some cases, you can subscribe through iTunes. This is easy to do and means that you can then manage that subscription through

the app store. You should be presented with a number of subscription choices and edit fields for putting in your name, password, email, etc. It depends on the particular streaming service and how much it values the convenience Apple offers its customers. Apple does a great job of making the payment and subscription process easy and fully accessible for people. There's the added bonus of managing all the various subscriptions you have through the app store in that one place.

Some of these services, including Netflix, don't allow people to subscribe through iTunes. Instead, they insist that people subscribe and manage their subscriptions on their websites. If people subscribe through iTunes, Apple then gets a 30% cut of the subscription revenues. Essentially, these services would be paying their competitors just for managing the subscriptions. Meanwhile, if people subscribe using their websites, the services keep all of the revenue for themselves. The apps are then merely tools to tap into content you've already subscribed to elsewhere. Apple doesn't charge for that. We see this with Kindle books where you need to buy the books on the Amazon website rather than directly from the Kindle app. To manage these subscriptions, update credit card information, etc., people will have to visit the websites of the services they use, keeping track of account credentials and everything

else for each service. I recommend that people keep a file or use an app like assistEyes Wallet to store such information. You could have a note in the Notes app that you can set to be secure so you need a passcode or touch or face id to open.

Creating an account is usually quite simple. I have yet to experience any difficulties doing so on a service's website. The Apple Keychain feature will remember passwords you use on various sites, which can greatly speed things up. Most services will also let you sign up for newsletters to keep you informed of what new content is coming your way on their service.

Once you've created an account, subscribed, and logged in, you'll be using the app of a particular service. A visit to the website of a streaming service will rarely be needed. Once you're subscribed, the app of the service will handle everything. Exactly what you find will differ slightly. When I open Netflix, the first thing I come to is a question asking who's watching. My wife Sara manages our Netflix subscription and has set up a profile for me. I always have to select my name. There's also a "kids" option that would limit content to family-friendly stuff. I merely have to flick right to reach my name and double tap on it. Other services don't offer this ability for different people to have their own profiles. Amazon Prime Video doesn't have this and just puts me on the home

screen of the app. Profiles can make a big difference to the user experience, because these services recommend things to you that you're likely to want to watch. They learn about you based on what you watch, so my profile and recommendations are quite different on Netflix than my wife Sara's. While our interests intersect, we differ greatly in when and what we choose to hear.

Once you're past that point, things become pretty similar between apps. You're placed on the home screen of a service, which is quite like a website. These home screens are designed to promote new offerings and also any older offerings that the algorithms of the service you're using predicts you might find interesting. It will have headings, buttons, and show titles. Double tapping on a show title takes you into the show's entry, similar to an app in the app store or an item's entry on an online shop. Once in a show's entry, you can read all the details about it by flicking through the contents just like on a website. You'll also find a Play or Watch Now button. There will be other buttons to help you navigate shows with multiple episodes and seasons. There will be differences in how easy it is to find your way around just like there are with websites.

Be on the lookout for sliders, combo boxes, buttons, etc. Interface elements like these are used often. Also, there are almost guaranteed to be tabs across the bottom. Netflix has

Home, Coming Soon, and Downloads tabs. The names are pretty self-explanatory. You'll spend most of your time in the Home tab of Netflix unless you're watching content you've previously downloaded or want to look ahead at what's coming. At the top of the Netflix Home tab, you'll find a Search button. Double tap this if you want to specifically search for a name, keyword, or show.

Things are similar when using the Amazon Prime Video app. They have four tabs at the bottom. Home, Search, Downloads, and My Stuff. The last tab is where you can access settings and manage your account, among many other things. I like having the Search capability in a separate tab. It declutters the experience when you really know the name of what you're after. This illustrates the kind of differences you'll find between the apps of streaming services. Take your time to look around and get to know the style of the service you want to use. That kind of exploration pays off.

When you're playing content, things get very similar at that point. The video will play and hide the playback controls. They clutter up the view for sighted people. Imagine how distracting it would be if VoiceOver announced second by second how far you were in what you were hearing. That's how it would be for them. Their emersion would be broken by having the

playback controls always present on the screen in a similar way. If you need to use the controls, just double tap with one finger to reveal them again. Then, flick left and right to get to the option you want and double tap it. The controls will hide themselves again after ten or fifteen seconds of inaction so don't doddle. If you simply want to pause or resume playback, you can do so most efficiently with a two-finger double tap. When the controls are revealed, you'll find something similar to what's in the Music or Podcasts app. Rewind, fast-forward, pause, or resume playback, and move using a position slider through the content. Also, you'll find an "audio and subtitles" option or something similar. Sometimes, it's called "language and captions". Double tap this, and you'll be where you can select subtitles or audio description. Again, flick left and right through the options and explore them thoroughly. You should be able to find the audio description option if the title you're playing has it available. Once you set this on for one title, you shouldn't have to do it again, since it'll remember that you prefer audio description and use it when available.

An Abundance of Choice

For the most part, these services try to be different than each other through various means. They have slight differences in the look of their apps. They compete for your subscription

dollars through price to a point, but there's no race to the bottom. If anything, prices are increasing as the amount of available content increases. You'll find the most striking differences when you consider the content they offer and create. Netflix is the oldest kid on the block. They were certainly the first streaming service I heard about as they predate this form of content distribution. They used to allow people to rent DVDs of movies for a flat monthly rate. Having and holding this dominant position, Netflix tries to offer some of everything. People will find all sorts of old and recent shows, movies of all kinds, documentaries, and comedy specials. I've found their original content to be the most extensive and varied. From the popular show "Stranger Things" about kids in the 80s living in a strange town, to original documentaries like "Our Planet", there's something special for pretty much everyone that you won't be able to find elsewhere. Netflix invests a great deal of money into creating original new content for its subscribers to see before anybody else does.

Since Netflix has maintained its grip on the "everything to everyone" spot, other services have needed to find other angles of difference. I've only dipped my toes into these services so far with the exception of Netflix, which I've enjoyed for over a year now. Keep this in mind as we explore farther. As far as I

can tell, Amazon Prime Video is going for a more bookish literary vibe. A great deal of their content seems to be somehow book related. You'll find original series like "The Expanse" and "Jack Ryan". These are both based on book series. This dovetails nicely with their Kindle and print book sales, which was a large part of how Amazon got started in the first place. It kind of feels right that they would go in this direction.

Meanwhile, Disney+ is all about making the truly massive Disney archive of movies and shows available as well as other properties they are acquiring. The most notable of these acquisitions as of early 2020 are the Star Wars and Marvel Comics franchises. I think of them as being the superhero inspirational brand. Disney has always been about dreams and inspiring family-friendly content. With their acquisition of the Star Wars franchise plus Marvel and other comic-related content, it seems clear that they're doubling down on this image with their Disney+ service.

Last but not least, Apple comes very late to this particular party. They have recently begun to make inroads especially with Apple Music, which is discussed in its own section elsewhere in this guide. Their streaming service for shows and movies is called Apple TV+, which ties directly into their TV app. This app also offers the ability to hook into

third-party services like Disney+, Amazon Prime, and others. The TV app will bring all of the content from the various services you make use of under its own roof. It can act as the central point for your viewing and will launch the proper third-party apps when you want to watch their content.

The Apple TV+ service offers Apple's own original content as well as a selection of channels with their own separate subscription fees if desired. Apple is really focused on originality and quality. It has a kind of high-brow feel to it. There's not as much content offered in Apple TV+. However, what's there is very unique and well done. The collection of original content is growing quite rapidly. It's like Apple is saying, "We may not have as much as the other services, but we offer better stuff."

The TV App

The TV app that comes with iOS will let you subscribe to and watch Apple's own content. This includes what's in the Apple TV+ service as well as some other channels with separate subscription fees. It also lets you connect accounts from other streaming services provided that they permit this. Once that happens, the TV app can display the listings for shows offered by those third-party services. For instance, if you connect Amazon Prime Video, any shows you watch in that app will be

displayed as entries in the TV app itself. However, if you actually go and play such content, the app created by the third-party content provider will open and be given focus. You will then view the show or movie you chose in that app rather than in the TV app. Apple, therefore, takes no responsibility for your viewing experience of third-party content, as it's contained completely within the separate apps.

There are three tabs across the bottom of the TV app that let you access three different areas. On the far left is Watch Now. This is where you can browse what's available through Apple's own service plus whatever third-party services you've linked the TV app to. The Library tab comes next in the middle. It contains any content such as movies and shows that you have purchased or downloaded. Over on the far right is the Search tab. This lets you look for things that you know the names of. It displays the results of your searches in an organized fashion. It also provides a list of popular searches made by others. Let's look at each of these tabs in greater detail.

The Watch Now Tab

This tab is the most dynamic and busy tab in the TV app. Similar to the Book Store tab in the Books app, it has a number of headings and buttons to help you navigate, constantly updating content. Near the top of the tab, you will find a

heading called Watch Now, which makes it easy to get back up to the top of the large scrolling area. Flicking to the right, you'll next find the Account Settings button. This is where you can set preferences as well as manage connected third-party services. Beyond that button, there are buttons for filtering contents. The Movies, TV Shows, Sports, and Kids buttons will limit the contents of the Watch Now tab to items fitting those designations. Once you use one of these buttons, you can always find a Back button in the top left corner that will return you to the main Watch Now view.

Past these filter buttons, you'll come to the first of many headings that divide up the many screens worth of available content. The Up Next heading indicates that the section immediately below it will feature shows you're currently viewing or have recently watched. You might find the next episode in a season or a movie you might be in the middle of. Flick left or right to go through the contents, and double tap on what interests you. It may begin playing automatically once you've done that. If you encounter a show or movie that interests you when doing your explorations of other parts of the app, there will be a button in its entry allowing you to add the item to what's in the Up Next section. Discovering that Apple TV+ was adding a reboot of Steven Spielberg's "Amazing Stories" during

my explorations, I immediately took advantage of this feature and keenly look forward to this revival of a very special show that I have fond memories of.

There are many headings below including What To Watch, which features recent additions or shows which might interest you. There's also a What You Can Do heading where you can learn more about what's possible from within the TV app. You'll also find a Learn About Apple TV+ heading. Beneath it are links and buttons along with explanations of what subscribing to Apple TV+ will provide you access to.

Keep in mind that even without such a subscription, you are still able to make use of the TV app. You can, for example, rent and/or buy movies directly from within the app and view them. The entry for an item you're interested in will indicate whether subtitles or described audio are available. There are other channels offered by Apple that you can directly subscribe to. As this content comes from third parties, there will be a subscription fee for these channels separate from an Apple TV+ subscription.

Library

The Library tab is where you'll find any shows or movies that you've rented, downloaded, or purchased. You are able to do things like deleting downloaded items to free up space. Also,

it's a handy spot for keeping track of rented content that you will want to watch before the rental period expires. There is a Recently Purchased heading for things like TV shows or movies that you have bought through the app or the iTunes store. These items will be shown under that heading even if they aren't downloaded onto your device. This lets you stream them without taking up storage space. Upon examining the Library tab, I found a documentary about science fiction that I had forgotten I had actually purchased in 2018 when it was released.

Other than the heading for recent purchases, you'll also find buttons for downloaded content as well as for different types of content such as TV shows and movies.

Search

If you know even a partial name of a movie, a performer, director, etc., this tab will likely prove a more rapid means of finding the show or movie you're interested in. Simply type in one or more words into the edit field and then double tap the Search button at the bottom right. You'll be shown a list of any results. If you don't type anything in the field, flicking past it will reveal a list of popular recent searches. You'll never be stuck without something there to double tap on. Keep in mind that any search you conduct here will only look at content available through Apple's TV+ service and the iTunes store.

Third-party app offerings won't be searched, and you'll need to go into their individual apps to explore what they have to offer. Any app of this kind will have a similar search capability. This will either be in the main tab at the top where you'll find a button or edit field. Alternatively, they may have a separate tab for your searches much like the TV app presents you with.

The Netflix Experience

Over the past year, I have spent more time than I ever would have dreamed using the Netflix app. Other than the TV app discussed above, it seemed logical to also examine the Netflix app and service so my readers would have a means of comparison when examining it and other streaming service options. Doing full explorations of every available service doesn't strike me as necessary, given how similar they are in terms of how they function. However, looking closely at two will hopefully prove helpful.

My wife Sara signed up for Netflix and found the app to be pretty accessible. She seemed to enjoy what she was hearing on the service. It didn't cost much more to add what they call a second screen, which allows us to each have a profile and watch things at the same time. I had been hearing more about how

they've added audio description to their content. It seemed like a good time to give it a spin.

Subscribing to Netflix was easy. Sara chose to subscribe through the Netflix website rather than the app. She had no problems subscribing or creating a profile for me. She just had to tell me the username and password. I used those to log in with the Netflix apps on my iPhone and iPad. In terms of difference between devices, I found no particular advantage for blind people in using an iPad versus an iPhone. Some of the more expensive iPads apparently have fairly good built-in speakers, which are better than what you'd find in an iPod or iPhone. They would also be more widely spaced apart, given an iPad's larger size. However, it's even more effective and less costly to employ one or two Bluetooth speakers for much better sound on whatever device you might use. The larger screen of an iPad might be useful for people with low vision.

As with other streaming service apps, you'll be using the same skills you would to browse the web. Knowing how to use the VoiceOver rotor helps a lot. Set the rotor to Headings, and you'll be able to get to different areas much faster. Also, to do anything other than browse and consume content, you'll need to be able to browse the web with Safari, since those things are done on the Netflix site outside of Apple's purview.

When you open the Netflix app, if there's more than one profile, it asks who's watching. Just double tap on your profile. On my iPhone, I don't always get asked. It just seems to know sometimes. Once that's done, you'll find yourself on the Netflix home screen. This has a very simple setup. It's similar to the Kindle app in that there's a Browse menu button at the very top followed by a search field. After that, you'll find a featured show followed by a very brief description of it. After that, you get into a large number of sections separated by headings. Use the rotor to flick up or down to the one you want and then flick left and right to brows. I've found that you sometimes find more items in a section if you go to the next heading and then flick left through the titles. Double tap on what interests you to leave the home screen and go into that entry. You never get stuck anywhere in the app. Just look near the top left for a Back to Browse or Close button to get out of an area.

The Netflix Home Screen

There are numerous headings with all sorts of recommendations. The top one is Top Picks for (your name), which tracks in on what you show interest in. It's a key reason we wanted separate profiles so that we'd get recommendations tailored specifically to each of us. There are also Trending

Now, Popular on Netflix, and a Continue Watching heading that features things you haven't completed viewing. As the service learns more about what you like, you'll find more headings further down the home screen.

You can scroll up or down with three-finger swipes. You'll be given page numbers to help you orient. Moving up or down gives you less pages, but you can also swipe with three fingers left or right across the screen. I think this moves you more slowly through the content, so there are more pages to go through. If I scroll vertically, I currently get around eight pages of content. Going across, I get around thirty-five.

The Browsing Filter Buttons

Near the top of the home screen, you'll find a button called Account Settings. This lets you manage aspects of your Netflix profile and account. Flicking to the right, you'll find buttons for TV Shows, Movies, and My List. Double tapping these buttons will take you into those specific areas of content. You'll find many different categories. These let you look at a range of content that isn't tailored specifically for you like a lot of what appears on the home screen. Other than a list of categories, you'll also find different show titles. Double tap on any that interest you to access that show's entry just as you would for a book or app entry in a store.

If you have your preference set to Described Audio in the Accessibility settings on your device, you'll always get audio description when it's available for items in Netflix.

Setting Preferences and Parental Controls

Double tap on the Account Settings option in the area at the top of the home screen. There, you can set parental restrictions and manage other areas of settings not found in the app. Netflix is like Amazon in that way. The app is all about consuming the content rather than account management and managing your subscription with Netflix.

Examining Entries and Playing Content

Once you've double tapped on an entry of interest, you are then taken into that entry, which will now have focus, filling the screen. There, you'll find details about it as well as a Play button near the top of the screen just after the Close button. The Close button takes you back to the home screen or the search screen you were in. Hitting the Play button will play the movie or the show episodes. It will keep going until you use a two-finger double tap to pause, or until it checks to see if you're still present and watching. It does this after a while and you can just double tap the Resume button to keep going. There are Rewind and other control buttons available including a slider letting you move quickly through an episode. The controls

are kept pretty simple during playback. After you finish an episode or movie, waiting long enough will let another one start.

Further Thoughts on Streaming Services

Overall, I think these streaming services are very advantageous for blind people. In addition to the rapid spread of audio described content, there is also the advantage of being able to easily explore what's on offer. Given the tremendous abundance of content available, that's a very good thing. One further advantage is the ability to pause what you're watching and look something up on a search engine like Google. If you find that an aspect, character, or words used in a show leave you confused, chances are that you'll be able to find a helpful explanation on the web. This might be a review of a show, a site set up especially for helping newcomers to a show or movie understand what's happening, or simply a review that happens to explain an aspect of what you're hearing. You can also often find plot summaries and other content that may explain parts that don't contain enough audio information to follow fully. VoiceOver can read subtitles. This has allowed me to enjoy content produced in languages other than English. Hearing VoiceOver read subtitles does tend to break that fourth wall and wreck one's emersion in the story. However, it's better than not

being able to follow a show at all. If you happen to use Braille, the subtitles can be sent silently to your Braille display rather than spoken.

I've enjoyed a lot of what I've heard over the past months of having these services available. It has helped me feel more connected to the wider cultural landscape. I've been better equipped to participate more fully in conversations with sighted family and friends. I hope that the quick tour of the streaming services offered here will give you enough information to start taking advantage of the services that most fit your budget and appeal to your interests. There's more content on offer than one could consume in a lifetime.

Getting Things Done: The iOS Device as Productivity Tool

If any device on the planet has totally outgrown its name, it is the iPhone. Initially, when iPhones and iPads first appeared, they weren't thought of as much more than consumption devices. However, they have gained so much in computing power and functionality over the years that it now seems ludicrous to use them merely for communication and entertainment. People have developed countless apps designed to help create things or complete tasks. Using only your iOS device, it is possible to create presentations, write books, produce videos, compose music, record and broadcast podcasts, and plenty more besides. Unconfined by physical constraints imposed by purpose-built devices, your iPhone or iPad can become whatever might be needed for a particular purpose. Need a different keyboard for more efficient calculations? No problem! Would larger keys let you type better in a word processing app? That's no problem either. How about virtual Braille keys? That can work too. Need a handy surface to sketch or paint on? If you have an iPad or iPhone, you have what you need. There are enough touch sensors and pixels to make an incredibly versatile interface possible and enough computing power to put that flexibility to tremendous use.

Through Bluetooth connectivity, it is even possible to take control of hardware, provided that an app is created to allow for this. Such hardware includes accessories like printers, keyboards, microwave ovens, etc. There are other more advanced possibilities that might also include 3D printers or other machines that can literally create or process objects. Some lab equipment can be controlled using apps on an iOS device. In 2019, an Apple design award was won by a system that allowed doctors in third-world countries to control low-cost MRI imaging equipment to make diagnoses.

Due largely to economics, I have no experience with such things as 3D printers or smart kitchen appliances. In this section of *Personal Power*, we'll therefore focus on the apps that, when combined with capabilities present in your iOS device, let you unleash your productive and creative mental energies to good effect. These apps don't come preinstalled with iOS, so you'll need to pay a visit to the app store to obtain them. Some of them are free for the taking. Others will have a one-time cost or will be based on a subscription model where you pay to use the app or service on an ongoing basis. Perhaps, you'll learn about an app that allows you to pursue your own personal creative, scholarly, or business-related interests and goals.

In writing this section, I am very conscious of the limits of my own explorations and experience with apps outside of those that pertain to writing. While I've heard of blind people producing YouTube videos, creating movies with Apple's iMovie app, creating music with GarageBand, recording podcasts, and many more things besides, I have largely stuck to what I myself have more familiarity with in writing this section. Therefore, I urge you to keep in mind that this is just the tip of the iceberg of possibilities. There are doubtless many apps that hold as yet undiscovered potential for productivity. Don't take this section as the sum total of possibilities. Rather, use the skills I discuss here and in other sections of this guide to find ways of accomplishing things. I would especially direct you to the section called Time to Play. The skills you'll learn through games are often the very same skills in operating apps that will serve you well when you try to do work.

Rather than going into great detail about how to use each of the apps covered in this section, I'll trust that people have gained the skills they need to explore and use apps. I'll use various apps as examples of techniques or conventions common to the use of many apps mentioned here. The possibility space is very large. People should go in with the presumption that there is likely an app that would help accomplish a given task.

However, that app might not be accessible using VoiceOver. Before you look for more costly alternatives, let's briefly go over the collection of apps that Apple makes freely available to all iOS users.

Apple's Office and Creativity Suite

Back when iPhones were new, these apps used to cost money. However, for years now, anyone who owns an iOS device is entitled to download and use Apple's creativity and office apps for free. Similar to Microsoft's Office apps that are also free on iOS, Apple has made a collection of apps to help people get regular office work done on their mobile devices. As with other apps produced by Apple, accessibility support has been included. These apps are fully useable with VoiceOver and work well with other accessibility tools. Content created with them can be exported to other formats such as Microsoft Word or Excel. Anything created with these apps is automatically stored in your Cloud, so you never need worry about losing your work.

This collection of apps was designed to be useful to everyone from hobbyists to professionals. They offer a very extensive set of features and are relatively large apps weighing in at around the 400 megabyte range. Having them come preinstalled would, therefore, take up 3 or 4 GB in total, which is a significant amount of storage on devices with lower

capacity. Hence, the need to visit the app store and download the ones you actually want to use. Each app comes with plenty of available documentation to help you make the most of the capabilities offered. As of late 2019, this collection includes:

Numbers

The Numbers app lets you create and edit spreadsheets. You can import Excel spreadsheets and work with them in Numbers. once finished, you can send the results to others in many different formats. It is also possible to work collaboratively with others using Numbers. Provided you know how to work with spreadsheets, you'll find it possible to do that work accessibly on your iOS device.

I've never been fond of spreadsheets nor very capable with them. However, I've been able to move around and change numbers on an invoice sheet without difficulty. The rotor is an absolute *must* here. You need to turn it to Row to move up or down. When editing a cell, set the rotor to Characters or Words. It wants to default to the Rows or Actions setting, so caution is needed here. Remember to double tap on a cell to enter Edit mode. There's definitely a learning curve to making effective use of the Numbers app, but it's quite possible to deal with spreadsheets on iOS devices.

Pages

The Pages app is Apple's answer to Microsoft Word. It allows you to do word processing on your iOS device. It has templates for various kinds of documents to help you format things correctly. As of July 2019, this includes templates for writing books in English. Now people who intend to publish a book in the Apple Books store can do so using the Pages app to create and publish the book. You can work collaboratively, tracking any changes made to documents. It is also possible to export documents to other formats such as Microsoft Word if necessary.

Pages makes heavy use of templates designed for different kinds of documents. The idea is that these templates will largely take care of the formatting for you, thereby letting you concentrate on what you're writing. You choose a template when you create a new document in Pages, but you don't have to do that if you're working on a pre-existing document such as a text file stored in your Cloud. You can flick left and right through choices in menus. The rotor gives you easy access to an impressive array of editing actions. Spellchecking is done through the Misspelled Words rotor option as in other areas in iOS where editing text is possible.

Each page in a document is its own edit field. This makes it possible to move quickly through your document by flicking left or right to the necessary page and then double tapping it to enter the edit field. The Pages app is brimming over with features that many people will simply never need. However, they are kept out of your way. Templates will handle a lot of the formatting work for you, presuming you like how they operate. I have no idea how easy it would be to modify an existing template or create your own without sight.

Keynote

This is Apple's presentation software. It lets you create and give presentations using your iOS device. You can label slides, use images and photos, and do lots of other things to add zip to presentations. I have never needed to create the kind of formal presentation that Keynote was built to help achieve. In this case, then, I'm afraid you're on your own. Check the AppleVis site and elsewhere online for guides, tips, and advice from people who have made use of this tool.

Other Creativity Offerings from Apple

For as long as I can remember, Apple has been known as the company that supports artists and creative types. They have produced a number of apps to further this objective. With its increased capability as of iOS 13, the Photos app could

certainly be regarded as one such app. It is also worth pointing out here that the Notes app includes the capability to sketch drawings just like a sighted person would on a notepad. It is also possible to use handwriting in place of a keyboard anywhere in iOS where text can be entered. These capabilities are unlikely to be of much use to blind people. However, the iMovie app as well as an app called GarageBand have successfully been used by blind people to create videos and music. Having absolutely no aptitude or experience with either of these things, I leave it to interested readers to figure out how to work them. I can say that both apps are built with accessibility in mind. My wife Sara, being musically inclined, has briefly tinkered with GarageBand, but has yet to use it for serious creation.

Apps Helpful to Writers

Writing is my main productive activity. Here, I'm in territory where I feel I can speak with some experience, having tried out a number of apps devised to help with the writing process. We'll take a close look at my writing app of choice as well as a collection of other apps that aid me in my projects.

The Ulysses Writing App in Depth

This app won an Apple design award at the WWDC, a conference for app developers. Shortly after this, the app was

made accessible using VoiceOver. Ulysses is designed to be a writing tool that scales from short documents through to novels. Simplicity and no clutter are key design principles. Writers can focus on actual writing. Using Markdown language to insert formatting instructions, removes the need for toolbars and other things that clutter and distract writers using other word processors. Other features include the ability to set writing goals, keep your writing nicely organized, and much more. Everything you write is instantly backed up to iCloud so no need to worry about saving progress.

This app rewards mastery of the rotor as well as exploration of the screen. Accessibility is good in all areas including goal setting. The developers are very responsive to suggestions and do their best to address problems. They are compensated for this attentiveness and continued development of the app through a subscription that people pay to use the app. This economic model allows for more steady and thoughtful improvements to the app rather than the constant attempt to attract new sales by introducing new and sometimes ill-considered features. Due to this, it has become my favourite writing app. I feel that I'm getting my money's worth when it comes to development of features and the overall security that comes from app developers having a steady income. I need not

worry that my favourite writing tool will suddenly be abandoned due to unsustainable economics.

Unfortunately, it is still possible to face a situation where changes are released that result in severe problems for blind users. I experienced this while in the home stretches of working on this guide. iOS 13 prompted the Ulysses developers to rush to support the new version of the operating system. Unfortunately, they clearly didn't check that the changes made wouldn't cause major issues for VoiceOver users. After updating, I and other blind users experienced profound sluggishness as the app slowed to a crawl whenever text was moved and at other times. This transformed Ulysses from a productivity powerhouse to a killer of time, as waiting for the sluggishness to go away was the only thing to do. It could take over an hour for this to happen. Any movement of a block of text plus other things normally done in the course of writing large documents could set off the sluggishness again. It took over two months before this crippling issue was resolved. I ended up exporting my work sheet by sheet into an app called Scrivener to continue working. Keeping track of which parts were most up to date in which app became a major problem. However, this painful stretch was the first crisis of this kind that I've experienced with Ulysses. It

worked splendidly well for most of the three years I've worked on this guide and works well again as I bring it to a close.

A "sheet" is what this app calls a document. You don't need to give a sheet a title. A single sheet can contain as much text as you want it to. There are no imposed size limits. Sheets can be put into groups that can be organized in many different ways. For instance, each major section of my guide to iOS is a sheet. I can duplicate, delete, export, or change the order of these sheets easily at any time. I can cut, copy, and paste text into sheets. Also, I can attach writing goals, notes, and keywords to sheets. Groups of related sheets can be exported as a single document. It is ideal for creating books. This is a very flexible and powerful organizational system. Groups can have goals assigned to them. Groups can be sorted in the best way for their specific contents. My group of AMI Audio files is organized by date, while the group of sheets comprising the guide I'm writing is organized manually. This lets me work on whichever section I might want to without changing the order of the sections.

There are instructions and help available in the app and on the developer's website www.ulyssesapp.com. The instructions are in special groups of sheets found in the main library. You'll be going into the editor to read any sheets that interest you. The

first group of instruction sheets is called "First Steps". Double tap on this to enter the group of sheets. Flick right until you pass the First Steps heading, and you'll be at the first sheet, which is "Quick Overview". Double tap on a sheet to open it. Flick right until you hear instructions being read. Once this happens, you can simply leave it to read the full sheet of information. No action is necessary. When finished, hit the Back button at the top left of the screen and proceed to find the next sheet or group you want to look at. The rotor is your friend. Set it to move by Character, Word, etc., and/or to select text for sharing or movement. Once a sheet is opened, you'll find a counter that may display total characters, words, sentences, etc. This is only visible when the keyboard is dismissed and not on the screen.

The heart of Ulysses is the editor. Once you open a sheet, you're viewing it in the editor but not able to write or change the contents. From this external view, you can set goals, change editor settings, and export the sheet if you wish. Buttons to do all these things are found at the top of the screen to the right of the Back button. Buttons are Editor Settings, Export Preview, New Sheet, and Attachments. Next comes the text field. To start writing, double tap on the text field. Now, when you move onto the text field, it will say "is editing". This remains the case

even if you move off the text field to use the onscreen keyboard. To leave this writing mode, double tap the Dismiss Keyboard button, which is one move to the right of the text field. Think of it like capping your pen. The app takes advantage of the autocorrect and spellcheck facilities built into iOS. These are useable but can be annoying. To minimize this, I have autocorrect turned off and simply use spellcheck. It will tell you if the word you move onto is spelled wrong. The Misspelled Words rotor selection makes the spellchecking process a breeze with VoiceOver. Navigate through the document using the rotor, setting it to Character, Word or Line as desired. Use the rotor to Select, Cut, Copy, and Paste text.

Move past the edit field while you're still in editing mode, and you'll find a Dismiss Keyboard button, a Search button, and a sort of toolbar that contains Undo/Redo, Paragraph Tags, Inline Tags, Special Characters, and Left/Right buttons. The "tags" buttons give you access to the Markdown language commands you'll use while writing if you can't memorize them. You don't have to use this toolbar equivalent at all. I never do, but it's there if needed. I recommend learning the Markdown XL commands and simply typing them in when required. Find them in the Markdown XL group of introduction files. This is immediately past the First Steps group.

While editing a sheet, you can push the Attachments button one flick to the left of the text field. The Attachments button lets you attach keywords, goals, and notes to sheets. There are buttons related to goal setting. For instance, you can specify an amount of words to reach or as a maximum. There are quite a wide range of goals, as well as the ability to set deadlines to help keep you organized. The ability to attach notes to sheets lets you keep information handy, which is useful for creating your document, but they won't be included when the document is exported.

Other Notable Alternatives

Many people object to the thought of paying a subscription to keep using a word processor. This is quite understandable. It comes down to how much you value an app's ongoing stable development and presence. If the continued expense or other factors dissuade you from using Ulysses, you have an ever-growing number of apps built for writers to choose from. It seems only fair to briefly go over some of these choices. All of these are available in the app store as of July 2019. Any app covered here works well enough with VoiceOver to be used productively. In fact, had VoiceOver been as far along as it was when I first turned to Ulysses, I may well never have gone

through the trouble of exploration and simply stuck to using Apple's freely available Pages app.

The closest competition to Ulysses is an app called Scrivener. Developed by Literature & Latte, this very popular and accessible word processing app allows you to create writing projects and organize any related content and research material into the same project binder. You then have everything you need ready for use and in the same space. It is easy to move between separate sections of a project binder. One section is for your draft. Another separate section is where you would put notes and research needed for your project but not intended to be part of what's published. Similar to Ulysses, sheets in your binder can be of any size and may be reordered and organized with ease. This app can be yours for a one-time fee of around \$20.

At a little over \$10, the iA Writer offers an even cheaper alternative. It has capabilities helpful to programmers such as the ability to handle regular expressions when doing search and replace. It also offers guidance for writers regarding English syntax. For instance, if you are guilty of run-on sentences or using too many adverbs, this app might be very helpful.

The Google suite of productivity apps are all quite accessible for iOS devices. This includes Google Docs. I have yet to try this writing tool. However, educational institutions

quite often make use of Google Docs and other apps produced by Google. The apps are available free of charge. If you have a Google account and make use of other Google services, you should take this app for a spin before paying for an app. This presumes that you're alright with Google's privacy and data collection policies. I've never heard of a case where people were disadvantaged in any way because of data collected through use of Google's apps. However, companies like Google provide apps and services with motives other than simply adding to the average person's tool set, so people should be aware of what they agree to.

As mentioned earlier, the Microsoft office suite of apps are also free for iOS. This includes Microsoft Word, which must be one of the most widely used word processors on the planet. All of Microsoft's apps include support for VoiceOver and are useable by blind people. You need a Microsoft account, which will also give you some Cloud space on their OneDrive service. As with Google, the same sort of data and privacy concerns apply. Read the license agreements and know what you're getting into.

Another popular writing app is called Bear. It focusses on capturing and organizing notes or ideas. The notes you create can be tagged, chained together, and manipulated in various

ways. This includes publishing them in multiple formats. If you want to sync your notes between devices and publish in a number of different formats, a subscription of around \$1.99 per month is asked. This removes restricted features and supports the app's continued development.

People who write blogs have plenty of apps designed to make publishing their posts easier. I use the Blogger platform for my personal blog and will typically write my posts in Ulysses. I will then export them into an app called Byword that can publish my entry directly into my blog with minimal fuss. I previously used an app called BlogTouch Pro but find that, these days, I much prefer the simplicity and better accessibility offered by Byword. Ulysses and other writing apps often have special exporting options to help post entries to various blogging platforms. Also, some popular blog and website hosting services have their own apps that may prove accessible. WordPress comes to mind here.

Apps for Better Notetaking

There are many choices of apps designed specifically for certain tasks. Word processors like Pages and Ulysses are not ideal for quickly taking notes, especially when on the move. For me, another app called Drafts happily solves that problem by dumping you instantly into an edit field whenever you open it.

Much more convenient for quick notes. It is possible to have Apple's Notes app automatically start a new note when opened. The setting for this is, naturally enough, in the Settings app. It is also possible to include the Notes app in the Control Center, so you can simply invoke the Control Center, double tap on Notes, and be put directly into a new note. This means that it doesn't need to take up prime space on one of my home screens just to be handy when needed.

Other apps have different approaches to notetaking. For instance, an app called Noted developed by Digital Workroom LTD. combines recording audio with the ability to timestamp written notes. This could be just the thing for students or people needing to record presentations. You can use up to five notes free to test the app out. However, to unlock the full features, you'll need to pay for a monthly or yearly subscription.

Another app called Allegory, developed by Shihab Mehboob, offers a one-stop app for notes and creative inspirations. There are facilities for art creation as well as written notes. Documents and audio recordings can also be added. Everything can be searched for using natural language. Terms like "yesterday" or "last week" can help you track down things you forgot the name of. With so many facilities, this app could be very useful

to people with no or low vision. The developer is eager for any feedback regarding the app including accessibility issues.

For people with a lot of thoughts and ideas to keep organized, perhaps a mind-mapping app could help you. One that is very accessible to VoiceOver users is called MindNode. Be certain that you get the latest version of this app. In early 2020, this is MindNode version 6. Even if you can't see the lines connecting the nodes, which are your ideas, VoiceOver informs you of such connections. You can keep ideas organized by how they are associated or connected with each other. For instance, I could keep a mind map of ideas for a novel with events, characters, and plot points connected to each other. It's easy to go through and change such connections later as your thinking changes. A very extensive approach to keeping track of ideas for ongoing endeavours.

Users who have low vision may be able to actually see how their thoughts connect. This can apparently be very helpful for assignments and larger personal projects. MindNode is free to download and try for fourteen days. After that, you'll still be able to view what you created but must unlock the app with a one-time fee of around \$20 to continue using all of its features.

Time and Task Management Apps

To keep projects on track, I have used a number of different apps. For people who use Microsoft's Outlook and Office apps on other platforms, the Microsoft To Do app may prove especially welcome and useful. You need a Microsoft account, but anybody who uses Skype will already have one of those. If not, you can create one for free. Even on its own, Microsoft To Do is an exceptionally accessible and free task management app with a rich set of features.

For larger ongoing work and personal projects, Things 3, developed by Cultured Code, is a good accessible candidate. It is costly at around \$13.99 Canadian, but if you need to organize a hectic life, it may well be worth getting. You can import reminders from other apps, organize projects and to-dos into groups based on areas of responsibility, and set up recurring events. Quite a lot of organizational power is packed into the app. It integrates with Siri and with your calendar and reminders. You can do everything with VoiceOver, as extensive work has been done to make this app very accessible.

While your going at a full clip, it may be inconvenient to stop and check the clock to find the time. There are numerous accessible apps that help with keeping track of and managing time. The Westminster Chimes Full app is my usual choice for

this. It alerts me to the passage of time at regular intervals via chimes, making it unnecessary for me to interrupt my work to check the clock on the status bar. It has a number of different options including several styles of chimes as well as spoken time updates.

It can be very useful to have any due dates and tasks with deadlines be seen along with the rest of your calendar. The Fantastical 2 app serves as a wonderful calendar that also integrates reminders, making it easier to keep track of when things are due in context with other life events. Fantastical 2 is fully accessible with VoiceOver, and the developer is eager for any suggestions. The app costs around \$8 Canadian in the app store.

This is just the tip of the iceberg. There are many other choices in this category of apps. I've heard very good things about OmniFocus developed by Omni Group. There are also apps that combine notes with calendar facilities. Moleskine has made its pair of note and calendar apps, Actions and Timepage, accessible for use by blind people. They are a subscription service, so you'll want to check the pricing and use the free trial offered by these apps to see if they're a good fit for you. The productivity category of the iOS app directory on

AppleVis has many other apps that have been found to be accessible to a greater or lesser degree.

Crunching the Numbers

For people needing more flexibility or a different layout approach to calculating, Adam Croser has developed three different talking calculators. These can read out large numbers better than VoiceOver and have other accessibility considerations such as different contrast modes. Functions are divided up into panels rather than being all crammed onto one screen. To get these, look for Talking Scientific Calculator, Talking Statistical Calculator, or Talking Calculator in the app store. All of these support VoiceOver. Price for these calculators is around \$6. It is possible to get these in a bundle or simply buy the version with the capabilities you require.

Another recent discovery is called PCalc, developed by TLA Systems LTD. It is a very powerful and flexible calculator that has been in development for twenty-five years, appearing originally on Mac computers. The iOS incarnation draws on that core and takes advantage of iOS features including accessibility support. You can try the basic calculator for free and then add sets of capabilities as desired through in-app purchases of scientific, engineering, and accounting packs, among others. For

\$13.99, you can buy the full calculator outright. Get the PCalc Lite app to try it for free and save money by adding only the feature packs you want. The developer is eager to hear about and fix any accessibility issues encountered.

Yet another alternative calculator called Desmos is specially designed for students. It is a graphing calculator and even the graphs are accessible to blind students thanks to auditory representation.

The only thing these calculators don't do is show the steps needed to reach their conclusions. Students will still actually have to "do the math". These more powerful calculators will, however, make it easier to check their answers. Outside the world of academia where quick results are what matters, these calculators will serve people well in everyday work and life.

Music and Audio Recording and Creation

Your iOS device can serve as an excellent and fully accessible audio recorder. The microphones built into iOS devices are very capable and optimized for capturing the voices of people. This helps with clear communications between people as well as in the recognition of vocal dictation or commands given to Siri. For more professional recording, external microphones that connect via Bluetooth or directly via Lightning or USB-C cable are available. There are a whole range of apps

for producing good recordings for lectures, producing podcasts, editing sound, and creating music. Many of these apps are fully accessible to blind people.

For basic recording, Apple provides the Voice Memos app that comes as part of iOS itself. For details on how to use this app, please refer to the Lifestyle Apps section earlier in this guide.

In the rest of this section, we'll examine three of the most popular accessible recording apps. Each of them is built with a somewhat different primary purpose and design. In each case, the app developers have demonstrated a commitment to making their apps as accessible and easy to use as possible with VoiceOver. However, there may be times when accessibility won't be up to the usual mark due to changes to iOS or other circumstances. Sometimes, in the race to stay competitive, accessibility has been overlooked, resulting in an app that was splendidly accessible becoming suddenly useless until problems are addressed.

Ferrite Recording Studio

Living up to its name, this app provides a full suite of audio editing and recording capabilities. Projects can involve multiple tracks and audio clips. There's definitely a learning curve here. However, in exchange for that effort, you get a very

powerful and versatile recording environment. It's perfectly possible to use it as a simple recorder as well. You don't need to master every aspect before you can put it to good use. However, a little learning can go a long way. There are ways to import audio such as sound effects or music beds, positioning and merging everything as needed.

Ferrite is free to download. This lets you try things out and make recordings up to an hour long. If you want to remove the one-hour limitation and unlock the advanced features, the app has to offer, purchase the upgrade suitable to your purposes. Unlocking everything costs under \$30 Canadian and gives you as powerful an audio workshop in your pocket or bag as you're ever likely to need.

Using VoiceOver, blind people can put all of this capability to use. There are special rotor options for choosing among editing tools and options. VoiceOver can read where the play head and selected audio is, allowing you to cut, paste, trim, and craft your audio creation with precision. Ferrite stores everything in its own library on your device. Everything is part of one or more projects. These projects can have multiple tracks and be as large as your device has room for. Projects can also be archived to other external storage including iCloud and many other options.

I have used Ferrite to do some fairly straightforward recording and make very simple edits. It would certainly meet any needs I might have were I to record a series of lectures or produce a podcast. I would say that it's the most comprehensive audio creation app known to be accessible for blind producers.

For full instructions about how to use this app, please see the excellent user guide available through the app itself. You can also reach it by going to www.wooji-juice.com. The user guide is available as HTML or as a PDF document. I recommend the HTML version for easier navigation. Be certain to read the section about accessibility and special VoiceOver controls the developer has added to allow for precise sound editing without the need for sight.

Backpack Studio

This app is designed to be a portable broadcast studio. The basic idea is that instead of extensive and recording and editing, people would record their presentation live. Sound elements, prepared material and other things can be added through the use of preloaded sound pads. Tapping one causes its sound content to play and be mixed into the recording in progress. In this manner, a podcast or live show can be conducted. The app does a lot of the mixing work for you and can be easily customized. Results can be saved as MP3 among many

other formats. In fact, it has facilities for people to stream their content live through SHOUTcast servers among other options. This capability is available as an in-app purchase.

The producer of this app values blind customers and has gone to great lengths to make the app as accessible as possible. More of this work will be needed, as the changes in iOS 13 have cause some serious focus issues for VoiceOver users. I have every reason to think that this will be corrected in short order, quite possibly before you read this section of the guide. People who like the idea of creating audio as more of a performance rather than a careful methodical approach of building and editing favoured by the previous app will want to give Backpack Studio a try.

As with the Ferrite app, plenty of help is available. It can be found in the settings area of the app. The button to access this is found near the top of the screen after the Files button. You'll find a tutorial, a means of contacting the author, and frequently asked questions. You can also visit the website at www.backpackstudioapp.com.

Just Press Record

This app is designed for recording and simple editing of a single track. The audio can then be exported for use in other apps. The major selling point of this app, aside from its very

simple and fully accessible recording/editing controls, is that it generates a transcript of the recording on the fly as you speak. This can be very useful if a searchable transcript is needed for notes or for material accompanying a podcast, making it accessible to people who can't hear the audio.

Open Planet Software has made this handy app fully accessible with VoiceOver as well as the new Voice Control feature in iOS 13. The app makes use of context menus to keep clutter to a minimum. One of the abilities tucked away in such a menu has to do with re-transcribing a recording after you've made extensive edits. Beginners would find this app particularly easy to learn. Priced at a modest \$4.99 US, it's well worth the cost. There are no ads, and that one payment unlocks everything the app has to offer. You can learn more about the app and access documentation at www.openplanetsoftware.com.

Further Thoughts on Audio Creation with Your iOS Device

This is definitely one of those areas where my minimal experience shows. The apps I've described above are just the tip of the iceberg. There are a great many more in the app store. Everything from simple note recording apps to full on recording and audio publishing tools. Many of these are unfortunately not accessible at all. Others, such as the Anchor podcast creation and publishing app, have seen their commitment to accessibility

waver over the years they've been around. They may be useful for more skilled users of iOS devices who are ready to deal with unlabeled buttons and other issues. Major changes to iOS such as those just experienced with the release of iOS 13 can throw further difficulties at developers who try to keep their apps stable and accessible to all of their customers. This most recent release has seen a high degree of that. Chances are that if a developer has gone to the trouble of making their app accessible, they'll go to the trouble of fixing accessibility issues that emerge going forward. I would advise people to make them aware of such problems in case nobody else has yet. Also, I would advise patience. This is a very competitive busy area of development. Developers are liable to rush out improvements that benefit the majority of users as quickly as possible and then tackle other issues later. This can be frustrating for people who have come to rely on a single app. I would urge anybody to try to find at least one app that will let them keep working during periods where their preferred app is inaccessible due to unforeseen effects of change.

Cooking With Apps: Your iOS Device in the Kitchen

There are many ways that your iPhone or iPad can help you with cooking. With Kindle, Apple Books and other reading apps, you will be able to navigate and read thousands of cookbooks. If

these were in traditional Braille, they would take up tons of space in your home, and you'd want to be very careful to keep them safe from kitchen disasters. However, with your iOS device safely in an inexpensive waterproof case, these cookbooks are infinitely more searchable and safe where they're needed most. There are also documentaries and cooking shows on services like Netflix. These can easily be found and listened to. Many of these shows have audio description included, so you won't miss out on purely visual elements. The YouTube portal has become a tremendous resource of instruction as people from all over have posted videos on how to do everything under the sun including cooking. These don't have audio description as a general rule. However, people often discuss what they're doing while they cook. There are also an increasing number of accessible food-related apps. These can do all manner of things from collecting and managing recipes available on the Internet, to keeping track of what ingredients you have or need to acquire. They often have the ability to place timers into recipes so you just need to tap and start them when you reach the appropriate step. Apps are also capable of converting measurements and identifying needed items using the camera in your device and Cloud-based artificial intelligence. There are also more appliances that may be connected via Bluetooth or WiFi to an app on your iOS device

that you can use to check status and/or control. This is just starting to enter the mainstream as this guide is being written in 2019. Devices such as the iGrill and Instant Pot are two of the more widely known examples of this trend. Digital assistants built into smart speakers and available for iOS devices may also work with some kitchen appliances. All of this kind of accessibility is thanks to an emerging phenomenon called "the Internet of things".

Most of this sort of thing goes far beyond my level of interest in cooking. I cook what I need to, to feed myself and any company. However, I don't enjoy cooking like a great many people seem to. I certainly enjoy eating, though. Every once in a while I do get curious about how some delicious food I enjoy gets made. As a result, I will derive some satisfaction from the investments I've made in apps and cookbooks to experience what they're like to use. If you add up the costs of every app and cookbook I purchased to write this section as well as part of the Read All About It section of the guide, you would come up well short of \$100 Canadian. I currently have no so-called "smart" appliances. Acquiring those would certainly go well above \$100. However, I believe you could equip a kitchen quite well with smart appliances for well under \$1000 Canadian, barring major refitting such as a smart fridge or oven. Money

can open up a far greater range of options regarding accessible appliances than used to be the case.

This subsection examines some of the apps my explorations turned up that blind people may find useful in the kitchen. The app store is the place to go for a huge number of resources to help people make the most of their time in the kitchen. From apps that help identify groceries to ones that let you collect and use recipes found online, iOS has a lot to offer people. The catch is that a larger portion of food and cooking-related apps either won't be accessible at all or will only be partially accessible. It's important that if you choose to obtain apps you find through your own exploration of the app store or other sources of public information about popular apps, that you have a good grasp of the capabilities of VoiceOver and go in with realistic expectations. On the positive side, Apple is pretty good at giving refunds if you find an app to be unworkable, but nothing says that they have to give your money back. they might ask you to try contacting the app developer to resolve difficulties. Therefore, I recommend that people not spend money they aren't ready to lose. Also, make certain that an app would be something you would really appreciate if it were accessible. If you contact the developer, keep in mind that he or she might never have heard of blind people using iOS devices. Politeness

has turned many app developers into staunch supporters of accessibility. You very well might be the one responsible for convincing a developer that we're an audience worth pursuing.

One example of an app like this is called Kitchen Stories. It was recommended by the Apple editorial staff and was also free. I read the description and learned that it was an app that let people share recipes, stories, advice, and videos. I found that the videos just had music and no talking in them. Many of the buttons in the app are labelled in a way unreadable to VoiceOver. When I tried to read the daily stories and recipes, I found them perfectly easy to read. The app has a shopping tab that generates a list based on recipes you're interested in making. That seems like it would possibly be useful and accessible. Overall, this app doesn't quite meet my threshold for something I'd use. However, you could read a recipe your sighted friend found in the app. There are likely other parts of the app that are accessible enough to get something out of. It's just not as perfectly suited for use by blind people as other better labelled apps are. It's a perfect example of something free to try that turned out to be somewhat useful but not perfectly accessible.

Timing Apps

Timing can be pretty important in the kitchen. Two useful apps here are the Camellia Tea Timer app developed by David Norcott, and the Timeglass app developed by Cosmic Teapot. The Camellia app has a group of timers set to the proper time to steep a cup of various kinds of tea. You can add more timers if the tea you get has different instructions. Just double tap on the timer to start it when you begin steeping the tea. It will chime when the tea is ready.

The Timeglass app lets you create and run many different timers, which can have spoken instructions or unique sounds. This is the heavy artillery of timing, and it's fully accessible. It comes with a library of pre-built timers. You can also enable a widget that lets you check your timers while the phone is locked.

Cooking Shows on Streaming Services

Before embarking on an attempt to cook something, it can really save a lot of time and trouble if you have some idea what you're doing and how to go about it. One of the exciting ways your iOS device can help you learn more about cooking is by allowing you to easily access shows and videos. Services like Netflix offer food-related documentaries and shows with full audio description. The AMI app offers cooking shows crafted to

be accessible. The CBC Gem app has some interesting stuff with and without audio description. And of course, there's YouTube. All kinds of people show off their cooking chops there, and the app is fully accessible with VoiceOver.

It all comes down to the VoiceOver screen reader and accessibility awareness among app developers. All of the major video content providers have made their apps easy to operate for blind people. Not everything is described, but all the videos can be paused and navigated easily without sight. This makes it possible to pause and take notes or navigate backward a bit to hear something you didn't quite catch. Below, we'll briefly go over some of the content available from several content streaming apps.

The AMI app makes content made by Accessible Media Incorporated available online. These TV shows are designed from the start to include audio description rather than it being added after the show's completion. Content is made available free of charge and can be downloaded for viewing while offline. Shows are easily navigated with pausing as simple as a two-finger double tap and playback controls fully accessible.

There are a good number of food shows. "Four Senses" features Christine Ha, a totally blind chef who won the third season of Master Chef. You have four seasons of Four Senses.

"Food Spin" features a chef who goes around Toronto in a truck called The Holy Grill. There's "Menu Match-Up", which has two visually impaired chefs competing with each other to cook food. All of these shows plus others are fully described. The app is easy to learn and built from the start to be as accessible as possible.

A whole lot of documentaries and shows about food are available for users of Netflix. This streaming service has made its app fully accessible using VoiceOver. Also, it has made audio description available for much of its content. This includes plenty of food-related shows. I just typed the word "food" into the search engine and got loads of them. These included Anthony Bourdain's "Parts Unknown", "Sugar Rush", "In Defense of Food", and many more.

Two particularly notable examples I found were "Salt, Fat, Acid, Heat", and "Chef's Table". Both of them are fully described. "Salt, Fat, Acid, Heat" is a documentary where Samin Nosrat, a renowned chef, goes to different countries to find out what elements go into various cuisines and tastes. Without audio description, it would be very hard to follow, since people from the countries travelled to speak their own languages. Thankfully, the audio description provided by Netflix includes a translation of the subtitles into spoken English. This makes the

experience a fascinating one even for kitchen-avoiding folks like yours truly.

"Chef's Table" is about different famous cooks around the world who discuss using various ingredients found in their area. They also talk about their experiences and circumstances as well as traditional dishes. We hear from illegal immigrants who have carved out lives for themselves and brought their expertise to the US. Again, the excellent audio description clarifies a lot, making this enjoyable and informative for the adventurous eaters among us.

Netflix is absolutely worth its subscription price for people wanting to learn about cooking as well as many other subjects. There's a large amount of well-described documentary content. I know I've just scratched the surface with my amateur searching. There's lots to be discovered. Also, it's possible to listen to a show while the Netflix app is in the background. You can do that and take notes in another app, pausing by using the two-finger double tap when you need to.

The CBC Gem app lets you stream CBC shows as well as live streams of CBC TV channels. You can do this ad-free by paying a monthly subscription or simply put up with the ads. There is a lot of content with described audio. However, you have to turn it on when you want it. There's no setting to make it come on

automatically. To do this, once you start a show playing, flick right or up over the controls depending on how your device is oriented. You will eventually come to the Described Audio button if the show you've chosen has it available. Double tap that button and the description will be turned on.

There's a "Food for Thought" episode of The Nature of Things show that is all about what we eat and what we should be eating according to scientists, which has described audio. Another show available from the BBC is called "Cooking with Joy". It doesn't have audio description, but the host talks a lot, describing things about British food. Not everything really needs audio description to be useful.

YouTube is one of those services that everyone has heard of. I think of it like the wild west of video content. Basically, anybody can create video content once they have an account. You'll find a very wide range of quality in all kinds of ways. Some videos will have so little dialogue that they'll be utterly useless. However, you'll often find videos where people talk enough about what they're doing or presenting so that you can learn something without having to actually see the video.

The YouTube app itself is easy to use. VoiceOver is supported, and there are spoken hints as you move over the

controls. It's even possible for blind people to create videos of their own. You can easily navigate, pause, play, and find videos of interest. Also, you can subscribe to channels created by people and follow people so you are alerted when they release new content.

The CNIB has some videos on kitchen appliances and organization that people might find useful. Blind people have also posted videos to YouTube, demonstrating how it's possible to cook while blind. Molly Burke has one about baking. A blind mother posted one about how she cooks dinner for her family. For the most part, though, you'll be finding videos made for sighted people that, if you're lucky, will have enough dialogue to be useful.

It doesn't stop there. There are other options for finding useful video content. Sites and apps like MasterClass offer actual courses developed by experts in their fields. MasterClass is one such option, but it's a pretty costly one. Too costly for me to test whether all of the components are accessible. I'm certain the videos would be easy to listen to and navigate. However, they wouldn't necessarily describe everything. They do seem to be lectures, so you'd certainly be able to learn something from the courses. Also, don't forget about podcasts. There are plenty of those about food that are entirely audio and

accessible with your favourite podcast app. Two that spring to mind are Mary Mammoliti's Kitchen Confession Podcast, and a somewhat older one called Cooking In The Dark.

Apps with Recipes

There are many apps to help you find and use recipes. These include apps based on cookbooks like the Joy of Cooking app and the Bettie Crocker Cookbook app. These let you search recipes far more easily than the actual cookbooks and have other useful features. For instance, they can build shopping lists based on recipes and convert units of measurement. They often have timers built into the recipe steps that need them.

Other apps take a more wholistic approach and help with a whole range of tasks involved in good food management. One food management app that really stands out as being highly accessible is the Paprika Food Manager 3 by Hindsight Labs LLC. There are millions of recipes found on sites all over the web. The app lets you capture these recipes directly from various sites using its own built in browser. You can easily save these recipes into your collection, and they're displayed with ingredients and directions separately. The app also has a pantry feature to keep track of what you have on hand and can build shopping lists based on recipes to help get what you need. It succeeds at being a highly praised, all-in-one solution that's fully accessible

with VoiceOver. You just need to find recipes to add by importing from the web or entering manually.

Apps from Famous Foodies

FitMenCook, developed by Nibble Apps Ltd, is an accessible app based on the work of a widely followed YouTube star and blogger. Kevin Curry has a massive following for his FitMenCook website and YouTube channel. The app has over 500 recipes that each have a video with spoken instructions. These videos are easy to navigate using standard methods. You can read the recipes but can't navigate line by line, so that's one potential trouble spot. However all of the tabs and elements in the app seem well labelled for use with VoiceOver. I've come across a number of positive messages about this app from members of AppleVis.

Costs and Other Concerns

These apps range in price from around \$3 to \$15. I don't think I've come across one over \$20, although some are subscription based. There are also some free apps like one called Tasty that seems potentially useful. However, it requires you to use Facebook to sign up for it and seems to be tied in with the Nielsen research company. They're the folks who did all the TV surveys to figure out what was popular. If the app is free and does a lot, chances are that it wants your data in

exchange. Keep that in mind when exploring various apps. It isn't always such a bad deal as people worried about corporations and data make it out to be. Just be aware of that possibility going in and read the agreements when you create accounts.

Concluding Thoughts on Productivity

What makes an iOS device such a compelling productivity tool is how you can combine different capabilities to help you accomplish things. The apps I've talked about above are clever creations designed for very specific purposes. While these are wonderful in their own right, there's nothing really revolutionary in terms of what they do individually. Recording tools, word processing, GPS navigation, timers, and other elements covered in this guide existed long before the iPhone had become more than a possibility that smacked of science fiction. The revolutionary strength of an iOS device is the way it lets you combine so many capabilities and bring them everywhere you go. There's a good reason why people are always looking at their smartphones. They let you do so many different things. While writing an email, you are literally a few taps or gestures away from checking the Maps app to see where the cab you're in is taking you. You can listen to your favourite tunes and talk with friends and family around the world via voice,

text, or video. During a lull in that conversation, you can do calculations, look up an interesting fact using Google, read your favourite book, etc. You can go instantly from writing a document to ordering dinner and back to the essay. If necessary, you could do it all one-handed or by using only your voice.

Currently, it's an early Thursday afternoon as I write these concluding thoughts for the section on productivity. The Music app plays a rather nice piano piece by Greg Maroney called "I Walk Alone". As two o'clock approaches, I do last-minute preparations for the segment I contribute weekly to for the Kelly and Company show. This is a show broadcast live on Canadian television as well as online at www.ami.ca.

It's an audio-only broadcast, so I don't need to worry about situating myself for appearance sake. Noise in the immediate area and having a good strong Internet connection are the only location-related concerns. I stop writing these words and switch documents within Ulysses to the prep notes I sent in earlier this week. Having read them over for the sixth or seventh time today, I realize I've done all I can in terms of memorizing information. I make certain that the Skype app is running so that I'm prepared to accept their call when they want me on the air.

Last weekend, my wife and I used the Big Finish app to listen to the drama I'll be discussing. Using that same app, I was able to skip around in the drama while writing my notes. The Safari app came in handy for quickly visiting the Big Finish site and checking the spelling of the names of cast members. After writing those notes, I used the Gmail app to send them in. Meanwhile, with the clock ticking down towards showtime, I check my Twitter timeline with an app called Twitterrific so I can retweet any mention of what's on today's show and my particular segment.

Having so much information literally at hand is a tremendous help in countless endeavours. This certainly includes writing. If I'm doing research for a story, I can turn to Google or Siri for quick concise answers. To dig deeper, there's Wikipedia, dictionaries, and thesauri, plus any ebook I've purchased and have on my device. All of that content is easily and quickly searchable.

I could have done all of this while on a bus or in a cab rather than at my desk in my apartment. Some accessories such as the keyboard I'm typing on, an external power bank, etc., can prove quite helpful. People with greater dexterity can write quite proficiently even without the Bluetooth keyboard I insist upon having. My wife Sara is quite speedy with the Braille

Screen Input method that VoiceOver provides. For more serious audio recording, an external microphone likely wouldn't go amiss. When it comes right down to it, having the right apps and being proficient in their use makes the greatest difference.

Being able to easily tap into the shared wealth of online lessons and videos wherever you happen to be is a massively helpful ability. The cooking examples I gave earlier are applicable to all kinds of projects. There are documentaries, shows, podcasts, and videos on things as diverse as crafts, to knitting, to public speaking, to building furniture. The possibilities are endless and very useful when you can pause, go back, and take notes.

When you're undertaking serious work, do yourself a huge favour and have a plan B. Find at least one alternative app that will let you keep working on your projects even if your preferred app has accessibility issues. I learned that lesson the hard way with the Ulysses app I used to write the majority of this guide with. Thankfully, I had another somewhat similar writing app ready to go during the two months it took to sort out issues introduced with iOS 13. Depending on what you're doing, you may not have as much choice as other people, since only a fraction of apps on iOS are accessible in a truly practical way. As awareness and accessibility laws expand, this

situation is improving quickly relative to what I've experienced on other platforms. If you find an app that would be helpful if it were accessible, contact the developer before giving up on it. Many of them are only too happy to put in the effort to make their apps as accessible and delightful to use as possible for everyone including blind people. Your moments of advocacy just might make it possible for others to pursue their own creative or employment dreams.

A World Market in Your Pocket: Shopping on Your iOS Device

A good friend of ours came visiting during the cold and wintery start of 2019. We wanted to try something different for dinner but getting to a restaurant was difficult and expensive. Another wrinkle was figuring out what things we had never tried before were going to taste like. More menus of places are posted online these days, so this problem at least was solvable with some pretravel googling. However, it's even better and more economical when you don't have to travel and can get things delivered to your door. Furthermore, you can take your own time browsing the fully accessible menus of places and asking Siri, Alexa, or Google what the heck this or that unfamiliar thing was.

Using an app called Uber Eats, we found that there was plenty of choice within our delivery range that cost far less than a cab ride for even one of us would have. We picked a middle eastern restaurant with a good rating from other customers and started making sense of the menu and picking what unfamiliar things we would try. The food arrived in good hot condition precisely when the app said that it would. We would get notifications as our order was prepared and on its way to us. Payment was done automatically with no need to show anybody our credit card other than the Uber company that acted as

middleman. The delivery driver simply brought the food to our building, buzzed us, and came up to our apartment. He wasn't there longer than half a minute and could simply give us the food and proceed to his next destination.

We quickly sorted out which meal was for each of us and enjoyed a delicious dinner. Some time after we ate, I got a notification that asked if I wanted to adjust the delivery driver's tip. It also encouraged me to rate the meals chosen, the restaurant's quality overall, and the delivery service. Each and every step was simple and fully accessible.

When it comes to shopping for physical things, blind people have traditionally faced two main obstacles. Getting to where the goods are and safely back with potentially heavy acquisitions is one barrier. Actually navigating the store and finding what you want to purchase is another. If you ask the staff for help or go with a volunteer helper, you're subject to their schedule in addition to any conscious or unconscious thoughts and biases they might have about you as a blind person as well as the goods or services on offer. As a blind person, you might never know about that slightly unfashionable chair on sale that would perfectly suit your situation but the sighted helper wouldn't dream of owning. Online shopping has removed a lot of friction from the shopping experience for blind people.

We can take our time and fully explore possibilities, reading the written descriptions of goods on offer. We can even go farther afield and read reviews of goods and services. More video reviews are appearing on YouTube and other venues. These typically have sound and are spoken by the creators so we can often hear what a product sounds like when used. Goods are shipped to your door removing the whole transportation and navigation issue.

Your iOS device lets you participate in online shopping via websites through your browser of choice. Also, many retail outlets such as Amazon, have their own apps to make shopping even easier for people. Not all such apps are made with accessibility in mind, though. You will doubtless find many instances where shopping via the website is a more preferable experience. Nonetheless, your iOS device can be a great and handy help in this aspect of everyday life. My wife Sara and I get all manner of things from groceries, to equipment, to medicines online. And then, there are all of the digital goods such as books, music, audio dramas, and much more.

Shopping on Websites

There are many different ways to make a website, so your experience will vary from vendor to vendor. However, there are a number of conventions that most outlets will follow. For the

sake of simplicity, this section presumes the use of the Safari browser that comes with iOS. Remember that you can obtain other alternative browsers such as Chrome or Firefox from the app store if you wish. In some cases, each of these may be able to handle different websites or situations encountered online in a manner that works better for your particular needs.

Careful exploration of a shopping website you intend to use is always a good idea and is well worth the time it takes. This is certainly true when it comes to finding out what's on offer. You may find out about sales and/or be guided to items that are even better suited to your needs than what you came searching for. Also, careful exploration of any shopping website may reveal options that might not be immediately obvious. For instance, near each item available at Grocery Gateway, there's a checkbox. This checkbox indicates whether to allow for substitutions should the item be out of stock. Let's say you order hamburgers and some buns to use with them. If our shopper can't find the exact kind of buns you ordered, he or she will substitute different buns and you'll still have an easy time eating your burgers. If the box isn't checked, no substitution will be made and you won't be charged for the buns you didn't get. This may be preferable if, for instance, you were gluten

intolerant or had allergies that might come into play if the wrong thing was picked as a substitute.

Creating Accounts and Logging In

Every online shopping experience I've encountered involves creating your own account with the vendor so that they are able to advertise to you and ease your shopping experience. This process need not happen right away. Indeed, you are sometimes able to shop as a guest and never set up an account. You will, however, need to provide any information relevant to the transaction such as credit card information and address. If you plan to do mor than one transaction with an online vendor, do yourself a favour and create an account. It saves a lot of time and is well worth the hassle. This process will involve filling in a form on the vendor's website. There will be edit fields to type in your name, email address, phone number, etc. I would strongly recommend people become comfortable with browsing the web and filling out forms prior to creating accounts with vendors. Correcting information once it has been entered can be frustrating if you don't have a good handle on how form controls and editing text works.

Once you have successfully created an account, most vendors will send you an email welcoming you and providing information. At this point, you will simply need to log or sign in with the

credentials used to set up the account. This is far less cumbersome than having to fill in address and other information every time you want to make a purchase. Often, vendors won't store all of your credit card information to increase your security. You may, for example, need to enter the CVV number on the back of your card to prove that you are indeed its proper owner.

While recovering forgotten passwords and such is possible, I would urge everyone to maintain a list of any passwords and other credentials for accounts you create. In the app store expedition at the end of this section, I will point you to the app I prefer for this purpose. It is by no means your only option. In fact, you could use the Notes app and encrypt the note used to store the information. I would recommend having one note with all such information in it that you could access whenever you forgot a password or other account information.

Finding What You Want

There's really nothing special about browsing an online store versus most other websites. There are simply some conventions that most online stores tend to follow. A common concept is the "shopping cart". Similar to a real physical shopping cart, you can put items you wish to purchase into the cart and carry on shopping for more. Items can be removed from

your cart if you have second thoughts. Once you've logged in or added an item to your shopping cart, it will remain there until you leave a store's website.

Another common concept is the "wish list" where you can add items you may wish to purchase in the future. Items added to such a list can then typically be sorted in various ways such as from least to most expensive. I'm particularly fond of the Amazon Wish List system, since you can sort and filter even massive numbers of items. I add any book I take a passing fancy to and then watch for price drops and sales.

Popup menus are another frequent design element. Double tapping on a Menu button will cause a menu to overlay the contents of the site. Flicking to and double tapping an item on the menu will let you access a deeper menu or else take you directly to where you want to go. For instance, if I'm on Amazon, I might double tap on Menu, and then on the Shop by Department item. This brings up another menu of all the various departments in the Amazon store. I often then go to Kindle, which is Amazon's reading system. There are Kindle devices and Kindle books, so I need to double tap on the Kindle Books item in the third deeper menu that emerged when I hit Kindle. At that point, I'm in the Kindle Books department and don't need popup menus to get around. I can either search for the book I want or

browse categories and featured content, including sales. There will be pretty standard form controls, links, and headings to help me navigate within the Kindle Books or any other department I reach via the menus described earlier.

Not all places are as well designed as others. You may need to spend time learning the particular quirks of an online venue. Typically, though, things tend to be pretty standard when it comes to the elements that make up a store. If you don't like an aspect of your experience, you can usually leave feedback indicating this. Alternatively, you can simply find a different online store that offers what you're after. Google can be very helpful in this regard. Another thing to keep in mind is that some places offer better descriptions of items than others.

Typically, an item name is actually a link that you can double tap. For example, I might double tap on a book title and find myself on that book's special place in the store. There's likely to be the book's title, author, and other information, plus a brief description of the book and some ratings and reviews of it. There will also be buttons that let me buy the book or add it to a wish list. I find it a good practice to always go into an item's unique area by double tapping on the name rather than simply buying it from the button that usually accompanies the item's brief description on the department page.

Completing Purchases

Once you've added what you want to your cart, it's time to complete the checkout process. Here is where things tend to vary. Many places will store your information so that you merely have to double tap on a Proceed to Checkout button, review your cart, and then place your order. This confirms your intent to buy, and the items are shipped to you or are made available for download if they're digital goods. Amazon makes it possible to buy items such as Kindle books merely by double tapping the Buy Now button. This is almost too frictionless and makes impulse purchasing super easy. You can alter this behaviour in settings that are attached to your account.

Some stores don't store your sensitive credit card information, so you'll need to re-enter it every time you shop there. This can be annoying but is a pretty secure way of doing things. Another way to greatly speed up and secure your online shopping is through a service such as PayPal or the more recently created Apple Pay. This shields your bank or credit card information, since these services act as middle partners, thereby limiting your exposure to theft. I've used PayPal for years with no difficulties or incidents. I would recommend creating a PayPal account to anybody who plans on doing a lot of online shopping. This is especially useful when shopping at

smaller, less well-known online stores catering to niche markets. An example of this would be an audio drama studio like Spiteful Puppet Creations. They and many similar studios sell the audio dramas they produce directly to customers via an online store. Using PayPal means I don't have to worry if their security isn't as robust as other more heavily trafficked places. None of my personal information, other than address if needed to ship a CD, has been revealed to them.

Shopping Using Apps

Many retail outlets have apps that, in theory, add to the ease of shopping using your iOS device. They typically make use of interface elements familiar to iOS users such as tabs, buttons, etc. These apps may also allow the use of Apple Pay. Many of them will also let you redeem a physical gift card by taking a picture of the code on it with your device's camera, which can be very useful for blind people. You will pretty much always have the choice of whether to use an app developed by the retail outlet or shop on the website.

One example of the kind of imperfect but manageable situation you'll run into happens with the Grocery Gateway app. Grocery Gateway is a service that delivers groceries to your home. That can be tremendously useful for blind people. Their app and website are both made to be accessible. However, either

because of visual design choices or other factors, things aren't nearly as easy as shopping at Amazon with its app and website. You have to feel and scroll around the app to find what you want. Things such as your cart, featured items, etc., have buttons that don't read as buttons. Instead, you will hear things like "cart off", "specials off", etc. It's consistent so you can get the hang of it, but there's friction where there shouldn't be.

Another thing to remember is that speed of reaction can differ greatly between shopping sites. With the Grocery Gateway app, it will often seem like your last double tap hasn't registered. Nothing will have changed even after ten to fifteen seconds. And then, you'll give one last check and suddenly find new content has appeared at last and you're where you want to be. This is also the case during checkout. Fortunately, a successful checkout always results in an email being sent, so there's no need to worry about paying twice for an order or anything like that. Just review your cart or the contents of that confirmation email carefully to make certain you haven't added any more items than you meant to. This is an especially easy mistake to make if you follow the common practice when shopping for groceries of building the next order based on the prior one. This can save a lot of time but has that danger of

adding an extra instance of an item not realizing it was already there from last time.

These gripes aside, I very much value Grocery Gateway's service and app. You can literally go around your home, checking what's still plentiful in your fridge, and add what you need while standing right there holding your device. People outside the Greater Toronto area will need to find a similar service to try. Most often, you will be able to call customer service and obtain assistance in placing your order if the app and website prove too difficult to use.

In contrast, the Apple Store app is a very good example of something close to shopping perfection. You are able to easily browse through categories of items and learn quickly what's on sale or being featured. The app will even help you when you're standing inside an actual Apple store. Responsive speed is very quick and clear. There's no waiting around. Checkout uses Apple Pay if you have this enabled, and, thus, is as painless as spending money can possibly be. To top it off, you'll be notified as your package makes its way to your door or is ready for pickup. Sections of the app are neatly separated into various tabs, including one for your basket of items.

One thing to remember is that updates to apps are a common occurrence. Accessibility is not always thought about or tested

for before such an update is released. An app you are able to use without difficulty one day might be rendered harder or impossible to use after an update. There are a couple of things you can do to combat this. One of these is to contact the app developer and report your difficulty. Quite often, they have speedily addressed concerns I've raised. The same difficulty happens occasionally with websites. Another thing to do is not to accept updates to shopping apps until you're confident that no accessibility issues have been introduced. This method requires you to keep watch on social media or at least the AppleVis site to be aware of unfavourable developments. It also requires you to take control of accepting updates and not simply receive them automatically. The more proactive you are, the less likely it will be that you'll be caught off guard and unable to use an app you might generally rely on. Ultimately, it's always good to have a plan B for anything essential.

Going Radical with Kickstarter

Another option when it comes to getting both physical and digital goods you might want is backing campaigns on Kickstarter. This is an increasingly common and accepted way of starting a business or launching a product. The concept is that an idea is put forth on the Kickstarter platform in the form of a fundraising campaign. This campaign has a project page that

includes a video demonstrating a prototype or explaining the project. It also has more detailed information about the product or service being funded. There is a funding goal set at the start of the campaign. People can back this idea with pledges of money that will only be paid if the campaign obtains enough pledges to meet the funding goal set at its start. If the campaign is successful, funds are collected from those who pledged, and if all goes well, backers will be rewarded in whatever way the campaign architects have deemed suitable for the level of backing each contributor makes. A common reward is to get a product at a price far cheaper than once it goes to ordinary retail channels. Backers also get products earlier than everyone else can, since their rewards must be fulfilled first. They, after all, have provided the capital needed to start production of whatever was backed.

Your iOS device and the Kickstarter app is a splendid way for blind people to explore, examine, and back these campaigns. I have backed over fifty so far. Mostly, I'm interested in ebooks being funded via this means. However, I have also backed some physical products including a ratchet belt that I now wear. During that campaign, I was able to use my iPhone to find out about the "Smart Belt", hear the owner's video explaining the virtues of these belts, and pledge enough money to receive one

as a reward. Further, I was able to contact the owner with questions and receive answers. This clarified points such as how to attach the buckle to the belt. I was also able to fully participate in the conversation among backers as things proceeded. This was very exciting to have that level of engagement while a product was under development.

The Kickstarter app and platform are just one example of many different crowd-funding methods. I focus on it because, in my somewhat limited experience, the Kickstarter site and app have proved to be the most easily accessible. Indiegogo is another very popular choice. This is yet another way in which iOS allows blind people to have an increased voice in the marketplace. I've made many people more aware of the needs of blind people who might be interested in their products. Many have gone out of their way to make their products more accessible. This includes making ebooks more easily navigable by screen readers and apps like Voice Dream Reader. The makers of Aftershokz bone conduction headsets have long been aware of their blind users and have equipped their headsets with built-in speech guidance. Part of why this awareness is spreading is that we have more ways to independently engage with and find out about different products.

App Store Expedition: Keeping Sensitive Information Handy and Safe

The assistEyes Wallet App

The assistEyes Wallet app is developed by Atlantia Software. It is designed to take advantage of security built into iOS as well as accessibility features. The app offers a convenient and safe place for blind and visually impaired people to store their sensitive information. Information is encrypted and stored securely on your device and in your iCloud. Before you can view any entries you put into the app, you need to verify your identity via Touch or Face ID or else a PIN number you come up with that is independent of iOS security measures. Entries have a title field as well as a field for content. You can edit entries easily at any time. Simply flick up or down while on an entry title to access options including removing it entirely. The app is very affordable and easy to use. Despite its age, the app works flawlessly and remains a very useful addition to my default home screen.

Where to Purchase Modern Audio Drama

One of the main sources of good audio books and dramas these days is at www.audible.ca. You can find a stupendously massive range of audio that is pretty affordable. You can listen

on smartphones, tablets, computers, etc. New stuff is added all the time.

For people into comics, westerns, and fantasy, you might want to check out www.graphicaudio.net. They have a unique approach with audio books in that they do the full book as an audio movie with voice acting, music, and sound. Their offerings never disappoint but can be expensive if you ever get hooked on one of their longer-running series.

Another place offering first rate audio entertainment is at www.bigfinish.com. You'll find all sorts of British properties like "Doctor Who", "Torchwood", "Sherlock Holmes", and much more. They do spectacularly good work. I particularly like their classics such as the Dorian Gray series.

If you're into H.P. Lovecraft and dark but campy horror, you may want to drop in at www.hplhs.org where you can purchase a growing range of dramas based on Lovecraft's work and ideas. They don't have the economics of Audible or Big Finish but still manage to create some impressive stuff.

With the one exception of the Lovecraft Historical Society, all of these audio drama vendors have produced their own special app for easy downloading and listening to their content. Simply obtain the Audible, Big Finish, and GraphicAudio apps from the app store. Once you've created accounts with the vendors you

want to use and logged into your account while in the appropriate app, you'll find it quite easy to download and enjoy what you purchase on the respective websites. For audio drama places you find that don't have such facilities and simply have you download a zipped file containing MP3 files, I suggest you use VLC Media Player or Voice Dream Reader. Both of these apps work quite well as audio drama players. All of these online venues and the apps or software associated with them are very accessible for blind people as well as people who are able to see. There's plenty of fun and thought-provoking listening to be had out there. Since everything's digital, there's no need to worry about shipping unless you want content on CDs. Some of the audio drama providers above offer this option.

A Truly Global Village: Using Social Media With Your iOS Device

Your iOS device can be a very handy and portable passport to the growing global village that is social media. To participate, you'll need to be competent in the use of VoiceOver. Also, you'll be making use of the app store to obtain the tools needed for your virtual travel. For the most part, you'll be able to use the very same apps sighted people do. Companies behind social media platforms are increasingly aware of their blind audience and of growing regulations regarding the need to make things accessible to people with disabilities. The result is that much of the time, we are on a totally level playing field with those who can see. Keep in mind that there are often other choices if you don't like how the official apps we'll focus on work or present information. App developers with the skill to create alternatives have done so where possible. Not all developers are aware of accessibility, though, so be careful. I recommend you check in the app directory on AppleVis to read any accessibility thoughts that others who have tried the app you're interested in might have.

I've selected three currently popular forms of social media to cover in this guide, which serve as examples. Don't for a moment think that there aren't any other social media platforms. There are a bewildering array of them with their own methods and

special features that differentiate them from other platforms. People have written books about them, so I won't reinvent the wheel here. My objective is to give you examples and information to allow you to explore with greater ease and confidence than I had when starting out.

As someone who has come to deeply appreciate the phenomenon of social media, I feel a keen sense of responsibility towards you, my readers. For some of you, much of this will be old hat as you will have participated using other devices. However, for some of you, your iOS device will be the very first opportunity you've had to explore this particular aspect of online life. You may not be fully aware of either the benefits or risks associated with participation. Through the time I take here, I hope to equip you to be good, safe, and helpful members of this new kind of community rather than its victims. Sadly, there are some truly deplorable people who use social media to bully, intimidate, and degrade others. Criminals make use of these platforms just as they make use of streets and other infrastructure to commit crimes. Keep this in mind when choosing what to reveal about yourself online. Also, keep it in mind while deciding what to believe about others.

Considering the Larger Picture

Before we start looking at various platforms and apps, let's consider social media as a whole. While the various platforms like Facebook, Skype, and Twitter have different characteristics, there are things they all share. I think it's a good idea to be certain we all understand what social media means as well as the forces which shape it.

In a nutshell, social media is a term that refers to an ever-expanding group of websites and applications set up to allow people to share content and participate in social networking. Facebook, blogs, email lists, Twitter, and YouTube are all various forms of social media. Each service has a different focus. However, they all have contact between people as a core idea. For the purposes of this guide, I've chosen to focus mainly on three currently popular platforms. These are Twitter, Skype, and Facebook. Here is a brief overview of each of them so you can compare.

Twitter focuses on shorter communications between anybody interested. It's like a casual conversation that anybody can join that never stops. Many celebrities have large numbers of followers. Public tweets can be up to 280 characters in length. People can use links to point their followers to longer material, images, videos, etc. Twitter also allows for private

messages between people who follow each other. Called direct messages or "DMs", these can be up to 10,000 characters long. This makes for a very useful combination. Public messages allow for questions or thoughts to be put out for comment and discussed in threads of manageable messages. Meanwhile, private conversations are useful for explaining things in greater depth when trying to offer assistance or explaining one's position fully to an individual. People might use Twitter to ask how to do something using a short public message. Once they receive a helpful answer, they can engage in more extended private conversation with the helpful individual, which doesn't clutter up the timelines of other people who wouldn't be interested.

Skype focuses on communication between private groups of people. It allows for video and audio conversation, file exchange, and text messages. You can tell when people on your list of contacts are available and online. Families and friends living far away from each other use this to facilitate keeping in touch when it's convenient for everyone involved. Think of Skype as the telephone taken to the next level.

Facebook focuses on friends and family and tries to be the thing you use to share videos, thoughts, and photos. It tries to be your one-stop shop for social interaction with interested groups ranging from family, to friends, to world-spanning

communities sharing similar interests. People can create posts as long as they wish about their life happenings or matters of interest to them. They can also add videos and photos to these posts. People are able to comment on these posts as well as each other's comments. Quite often, this results in long conversations or threads growing out from initial posts. Facebook has expanded from this core concept to include apps and games that people can use on the platform. These tend to be visual in nature and inaccessible to blind users. These expansions have made Facebook a cluttered and busy environment to navigate.

In the old days, you would pay a telephone company to connect you over long distance to people elsewhere in the world. You would pay for stamps to mail messages and packages to people. This still happens. However, social media offers the chance to communicate with the people who you care about at no cost. You can talk for hours to relatives or friends without paying a penny of long distance charges. How is all this paid for?

It all comes down to your attention and interests. Businesses are trying to make money and find out about people. Providing useful services such as the ability to communicate free of charge has proved a very effective means of getting

peoples' attention. They allow people to advertise on these services, which helps cover the costs. Your content and attention become the products sold to advertisers and other businesses by social media companies. Your participation draws your friends and family onto the service where they themselves create content, encouraging others to join. Sometimes, the content generated by people is so popular that those people can themselves make money through their use of social media. This requires harder work than many people surmise and also requires very careful thought about how one uses social media.

The trick to thriving for these companies is to maintain a balance between allowing advertising and use of data without alienating people who just want to socialize with each other. Fall off one way and there's no money. Fall off another and there is no user base. It is quite possible for these companies to fail. People don't talk about Myspace or MSN Messenger much anymore. Facebook has lost status as the cool place to be among younger people. Recently, it has also suffered some serious public relations damage and loss of trust due to the misuse of people's data. However, Facebook's overall popularity is such that it has so far survived these crises. Most social media platforms have suffered bad publicity. Blind users have seen the community once known as Audioboo completely change and no longer

support the kind of community they used to. The company simply couldn't sustain itself without changing direction. This has left many people feeling angry at the loss of a community of friends they once took for granted. Since we don't directly pay money for the maintenance of the communities that form on these social media platforms, they can seem more permanent than they actually are. The community you join may be less permanent than it feels. Take steps to make certain that the friendships you form will survive the collapse of the companies whose services made them possible. Have alternative methods of contacting friends you make online.

Why Go There At All: Positive Experiences with Social Media

These days, there is a lot of talk of the dangers of social media. We hear all the time about cyber bullying, ruined lives, and ill-conceived remarks coming back to haunt people. The next major subsection will explore these dangers in some detail.

First of all, though, I'd like to share some positive experiences I've had through my engagement with social media. I tend to think of social media as a tool. You can use a hammer to build and repair things. However, you can also use it to smash in somebody's skull. Just because people might use a hammer for the latter purpose doesn't mean you should avoid hammers all your life. I advocate a reasonable, thoughtful approach to

social media that isn't dominated by too much fear. In my judgement, there's frankly far too much good to experience through social media to let the bullies, criminals, and deranged idiots out there scare the rest of us off.

What kind of good? For one thing, the only reason I've ended up happily married was thanks to a blog I still occasionally maintain. A mutual friend found my blog and decided to contact me. Our conversations led her to put me in touch with Sara, a woman I hadn't seen since we attended the Lake Joseph vacation resort during the same week one summer. Sara, who is now my wife, began listening to audio postings, and, eventually, we began talking. The rest is our happy private history.

These days, Facebook seems to be the point where past meets present. Thanks to its facilities for posting photos and videos as well as text, it has remained popular with groups of friends and families trying to keep in touch. While I was working on this guide, I was contacted by a friend from secondary school who wanted to arrange a reunion. That contact led to four of us school friends who hadn't ever assembled in person since those school days getting together for a meal and evening's conversation. Facebook has also let me know about a number of family events and get-togethers over the years. People who recognized me in pictures or from podcasts and a documentary

that I have participated in have also gotten in touch with me thanks to Facebook.

For years now, I've been a member of social groups, and they've kept me informed about new apps, events, and other items of interest. I have also been able to share my knowledge and help other people get things done. I don't contend for a moment that friends made online can replace friends you interact with in the physical world. However, experience has shown me that people who completely devalue online relationships are willfully ignoring the possibility of a potentially helpful and meaningful form of connection. It really isn't an either/or choice. You can participate in the offline and online worlds. It's a matter of self-discipline and knowing when not to care.

I have friends who travel a lot. Through Facebook and Skype, I have been able to keep in touch with them and find out how they're doing. More than that, I have occasionally been able to assist them in their adventures through sharing my own knowledge and experience.

When I, myself, have needed help, I have frequently gotten it very rapidly after asking my questions on Twitter. You can post a question publicly and then receive competent detailed assistance through privately exchanged messages. I have often

been able to provide timely assistance to people in the same manner.

Later on in this guide, I'll examine the phenomenon of Internet radio in detail. This is a combination of social media with the ability to broadcast an audio or video stream live on the Internet. The community that can grow from this has been tremendously positive in my life.

More broadly speaking, social media lets anybody spread information about events taking place very quickly. This has led to lives being saved and has changed how world history has unfolded. It has become much harder for those who, confident that nobody will know about it, would abuse their power or take advantage of people. Police forces have used social media to enlist the public's assistance, and this has saved many lives.

The Dangers of Social Media

It helps if you think of these services as actual public places you're going to. When we travel, we typically take precautions. I use my white cane to check ahead of me for obstacles. The echoes of its taps can also alert me to things around me. I make certain that what I carry with me is secure in pocket or pack. Typing on a keyboard, tapping on an iPhone, or uploading a video don't require much physical effort. There's an unreal quality about doing these things, which gives people a

false sense of invulnerability. Beyond the larger concern of corporations misusing data they gather to operate and make money from their services, there are many personal pitfalls for users of social media platforms who aren't careful. The consequences of your online activities can have profound effects in your actual life and those of others. Think about what you share and who you share it with. Let's examine these dangers in greater detail.

Drama

Like any other community, you'll encounter interpersonal relationships gone wrong in spectacularly public fashion. People can disagree angrily with each other even in ideal circumstances. When they're rushed, half distracted, and otherwise engaged as they often are while pontificating on social media, there is even more room for misinterpretation and a lack of thought before posting. This is often called "drama". One misunderstood remark can fill your timeline with absurdity as people join the fray with their own take on what was said and actually meant. You can find yourself sucked into it if you aren't careful and aware of what people say about you. It can feel like you're under siege as you deal with responses to a tweet or Facebook post you made that was taken completely out of the context in which you sent it.

The best defence is to be consistent and take a moment before sharing to think about how it might be misconstrued. Provided you act responsibly on social media, I've found that people will know enough about you to prevent unflattering falsehoods from sticking. If someone ever accused me of murdering someone, they'd have to convince a tremendous lot of people who know me well enough to know I'd be extremely unlikely to do this. The same goes for other less serious but potentially hurtful things such as being thought of as a racist. I consistently try to be as fair and open-minded as possible. People who saw a single instance when I failed to live up to these ideals or was misunderstood would run into a lot of people who know me enough to set them right.

Digital is Permanent

I was asked by a friend to start a blog on a platform he developed to be accessible for blind people. The timing for this seemed absolutely terrible, as I had just separated from my first wife. The only sort of blog I had any interest in writing was a personal one rather than about a topic like access technology. Anybody who has lived through a separation that you know from the outset is effectively the end of a marriage can appreciate the emotional turmoil one goes through. The angry thoughts, dips into profound soul-searching as you evaluate

everything against your inability to keep the most solemn and sober vow you've ever made ... I cringe at some of what I remember thinking at the time. However, before committing my thoughts to my blog, I always stopped and asked whether I was truly alright with them being out there in the digital world for anybody to read and potentially misuse. It actually made for wonderful therapy as I had to step back and take a more objective look at my thoughts. As a result, I don't regret what's out there. Doubtless, there are messages I'd have second thoughts about, but overall, I've done a reasonably good job of staying clear of sharing damaging things.

Unless you specify otherwise, anybody can see posts you make. Also, anyone can use what you say completely out of context for their own purposes. Do you believe in what you're saying enough to have it potentially be what you're remembered for? What you say today might very well come back to haunt you tomorrow or even years later. For instance, during the US presidential election held in 2016 while this guide was being conceived of, a very controversial and divisive man became president of the United States. Emotions ran very high and people have said some truly horrific things on various social media platforms. These are out there for anybody to see including potential employers, friends, detractors, etc. Some

remark made against Donald Trump on Facebook might conceivably end up preventing someone from Canada or the UK from visiting the US, since border guards have the right to search peoples' social media. What you share online can have offline consequences.

Here are a couple more examples that have stuck in my mind years after they've happened. There's the case of a young employee at Burger King, a fast food restaurant. After his shift one day, this young man and at least one friend who took the video, thought it would be funny to use one of the large industrial sinks for taking a bath in. This fellow washed himself in the sink while a friend made the video and posted it to YouTube. The video went viral, which basically means a whole lot of people saw it. This included the management of the restaurant, who promptly fired him. It also has included potential employers who have elected not to hire him over the years. Something that might formerly have been one of those silly episodes you joke about with friends and family has stained this young man's reputation badly. There's nothing he can do to prevent the video from being available. It could haunt him for the rest of his days. He will forever be known as the Burger King Bather.

Another case involved a lady who worked in public relations. She went on a vacation to visit relatives in South Africa. Before she left, she sent a message on Twitter to her followers:

"Going to Africa. Hope I don't get AIDS. Just kidding. I'm white!"

During the long flight, that tweet was retweeted and commented on thousands of times. She was completely oblivious as her infamy spread. What she thought of as a harmless joke between online friends was being taken out of context and offending many thousands of people who she had no idea her words would ever reach. Those words were enough to utterly ruin her personal life and career in public relations. The incident is still often cited today over four years later as a clear illustration of what careless use of social media can do.

Cyber Bullying

What you share can be used against you by cruel and immoral people. There is no refuge from bullying done via social media. The whole idea of it is that you can participate in social media wherever you happen to be. Unlike previous generations of students, the advent of social media means that you're never safe from bullying. It will follow you home. Those photos or videos made while a relationship is fresh and enthralling may prove inescapable after a breakup occurs. Even if you deleted

your account from every social media platform on which you had been bullied, other people could still spread false or harmful information about you. People of all ages have had their lives turned into nightmares by total strangers who spot an opportunity for sadistic fun. This has driven some people to take their own lives.

I hope the preceding paragraphs have given you an inkling of the possible negative aspects of social media that you may well encounter. Overall, my experience has been a very positive one. Part of the reason for that is the care I've taken to use these services responsibly. To be even better informed about these online dangers, I would urge you to read the following two books:

Extreme Mean: Ending Cyberabuse at Work, School, and Home by Paula Todd

So You've Been Publicly Shamed by Jon Ronson

Defensive Measures

There are things you can do to minimize any damage you might experience through using social media. Different platforms will offer their own unique options and tools to guard your information, and you should take the time to become familiar with these. Meanwhile, I can offer you the following more general advice:

It's all about keeping your own sense of intrinsic self-worth foremost in your mind. Also, know who the important people in your life are. What *they* think of you is far more important than what people you've never even met in person think of you. Don't be unkind or dismissive to people who you associate with online, but don't let their feelings or problems swallow you up.

All platforms will have options to block and unfollow people who cause you distress. Don't be afraid to use these options. Other people are equally free to do likewise to you. Remember, also, that your time is valuable. Don't feel that you are under any kind of obligation to become involved in drama if you don't want to be.

Twitter

Twitter is a network that focusses on brief messages between people. Public messages are limited to 280 characters. Private messages can be up to 10,000 characters. Businesses use Twitter for advertising as do political leaders. Due to the limitation on the length of a single public tweet, conversations tend to be ongoing casual ones or very concise debates. People often try to fit everything into one tweet, which can lead to misunderstandings. There's a lot of "stream of consciousness" discussion where people don't think very carefully about what they tweet. Twitter is a great place to get technical help,

since you can ask publicly in a short tweet and then exchange longer private messages with people you follow who also follow you.

Twitter makes a good first social media platform for beginners to try out, because it has kept things relatively simple. It has grown from being purely text-based to something more friendly to visual thinkers, but the core functionality remains the same. It is my favourite social media platform due largely to this overall simplicity. I've had some truly excellent conversations and online community experiences thanks to Twitter. Attending a virtual end-of-world party and observing how people reacted to Harold Camping's prediction of doomsday was absolutely fascinating. On Twitter, you Get to know people slowly over time as they post short messages about their lives, ask questions, etc. One day, you may suddenly realize you have become online friends and actually care about how things are going for someone you will likely never meet in person. Twitter allows you to be more in tune with what's happening in the world in a very accessible and personal way.

Twitter started out as a website. You can still use it in your browser of choice rather than using an app at all. The site has been made accessible for screen readers. However, I wouldn't advise this, as the app makes interacting a whole lot easier on

your iOS device. There are also official Twitter apps for Android, iOS and Windows, among other operating systems.

To use the Twitter service, you'll need to create an account. You can do this from within the app or from the website. You'll need to give Twitter your email address and a password. You would also be wise to set up security by giving it your phone number so that if the need arises, it can provide you a code via text message that will verify your identity. If someone hacks your account and learns your password, this verification can help tremendously when attempting to recover control of your account.

The Twitter App

There are four tabs across the bottom of the app. From left to right, they are Home, Search and Explore, Notifications, and Messages. At the top left of every tab screen, you'll find a button called User Menu. That gives access to a menu of things affecting the user experience. There are settings, access to your user profile, and many more options. This is followed by a heading informing you which tab you're in. This isn't the case in the Search and Explore tab where there's a search field in place of a heading. To the right of that heading, things change depending on which tab you're in. Any controls or options will be found near the top left of a tab screen.

The Home tab is where your timeline is displayed. This includes new tweets from people you have chosen to follow. You can flick left and right to have tweets read out to you. There are also recommended tweets and recommendations on people to follow. Near the heading at the top of the tab screen, you'll find a Compose Tweet button. Past that, you'll encounter your timeline, which can scroll infinitely. If you read a tweet you want to examine more closely, double tap on it with one finger. This opens the tweet and also shows you the thread that the tweet is a part of, including any replies made to it. You can also double tap with two fingers on a tweet. This is called a "magic tap" gesture, which can perform different functions in different apps as required. This overrides the normal function of this tap, which is to pause or resume playback. While in the Twitter app, a two-finger double tap will activate a menu, giving quick access to commonly used Twitter functions such as Reply, Retweet, Like, etc. Flick right through the options.

To compose a tweet, double tap on the Compose Tweet button at the top of the Home tab. You will then be put in the tweet composition screen. There, you'll find an edit field to type your 280 characters. You'll be automatically placed in it. When finished typing, flick right, and you'll find all sorts of options to add photos, broadcast video, etc. The Tweet button

used to send your tweet into the world is found at the bottom right corner of the composition screen.

The Search and Explore tab is where you can look for people or tweets of interest. The rotor set to Headings is your friend here, as you can quickly get to different exploration facilities. There are headings for Today's Moments, Trends for You, a Connect button, and many more items of possible interest. You can't do any harm by looking around.

The Notifications tab is where you'll find any mentions of you as well as other notifications like tweets from people you want to be certain you see. Also, if anybody Follows you, Likes or Retweets a tweet you send, etc., this will be recorded in the Notifications tab. It's a good idea to check every so often for new notifications. At the top left of the tab, you can find the Notifications Settings button where you can customize what you're notified about.

To send a message, you can use the New Message button at the top left of the tab screen. You will be placed in the area where you specify who the message is sent to. You can use the search field or flick right through an alphabetical list of your followed Twitter contacts who follow you back. You may send private messages to these contacts. Otherwise, you must communicate with public messages until you follow each other.

Private messages are limited to 10,000 characters. This can be tremendously helpful when clearing up misunderstandings or offering technical help.

Once a conversation has started, you can double tap on a tweet with one finger to enter that thread, whether it's a private one in the Messages tab or a public one. At that point, you're examining the whole thread. Flick left or right through the tweets. There will be a text field near the bottom right where you can add to the thread by replying. Double tapping on a tweet within a thread will focus specifically on that tweet and any replies to it.

You can easily get back out of these threads. At the top left corner, there will always be a Back button. In other circumstances like when you're in the composition screen and want to leave it, look at the top left for a Close button. You're never trapped anywhere. There's always a Cancel, Back, or Close button at the top left to get you back to the main screens of Twitter.

Skype

Skype has been around for over a decade now. It set itself up as the replacement for the phone, letting people talk or send messages to each other for free over the Internet. It also allows the sharing of pictures and other files. It still excels

when it comes to contacts between close private groups like friends, employees, family members, etc. A lot of businesses use Skype extensively to cut down on communication costs. People will still often hear Skype mentioned as the preferred means for distant family, friends, and lovers to keep in contact.

At present, the Skype app for iOS is completely accessible. However, there have been major accessibility issues from time to time. Skype developers haven't always considered accessibility before releasing updates to apps. However, once they are made aware of accessibility issues, problems tend to be addressed fairly quickly.

The Skype App

Three tabs found at the bottom of the screen take you to the Chats, Calls, and Contacts areas of the app. You start in the Chats tab. At the top of the screen, you'll find a series of controls. The first is a Notifications button. To the right of that is a My Info button, which gives you access to your profile, mood, and online status. Next to that is a New Conversation button. To its right is a search field for finding people to talk to. To the right of this is a Manage Chats button. After this, you'll find a Favorites heading. Any conversations so designated will be found beneath this heading. The next heading down is called Chats. Beneath this, you'll find

all of your conversations in order of most recently updated. Double tapping on a conversation lets you access it, and the focus will shift to that conversation.

In the Chats tab, you'll find a list of conversations in order from most recent to farther back in time. Flick to the one you want and double tap. Once you're in a conversation, messages appear in order from first to last. Flick right to go through them. You'll find an edit field where you can type in your message and a Send button one flick right of the edit field. There's no limit on message length.

When you're in a call, there will be controls letting you mute, end the call, and do other standard things. You can also be in group conversations and calls. People can be invited to join group calls with one person acting as manager or host. Any messages typed will be shared with the group unless they're privately directed at individuals.

The Calls and Contacts tabs let you manage these aspects of Skype. You are always able to block and unfollow contacts if circumstances warrant this. Other options such as muting them give you more choice when dealing with people who you might not always want to hear from.

Skype is attractive, because it has software for many different platforms. There are apps for Android and Windows as

well as other operating systems. You can communicate with anybody who has a Skype account regardless of what devices or operating systems you or they choose to use. In this world of so many choices, tools that let you do that are very handy to have. You can also check to see when people you want to contact are online and available. This is a step above simply calling someone in another time zone and wrecking their night's sleep. You can set yourself to "do not disturb" by going into the My Info section and flicking once to the right of the Close button. You'll find a Do Not Disturb button.

Personally, I prefer not to have this app running all the time. I've used it to keep in touch with friends living in different places. One fellow I once tutored in access technology is over in Japan now looking for work, and I was able to give him advice and find out how he's doing. Also, I participate often in group calls with former students of the W. Ross Macdonald school. In the past, I've helped people with learning to speak English, and have participated in interviews via Skype. When I do my weekly segments on the Kelly and Company show on AMI Audio, I use Skype for these segments.

Facebook

Facebook is a very popular social media platform that has become extremely well known and widely used. People can send

messages, talk, post text or video updates to their own personal news feeds to keep friends and family informed and write comments on each other's posts. There are many games and apps specifically written for Facebook to increase social interaction and use of the service. This makes Facebook quite an expansive and complex service to become familiar with. It's trying to be the one-stop shop for social interaction. In doing this, it has become rather complex. If you are able to master Facebook to the point where you're comfortable with it, you should have a pretty easy time of most other things you might choose to attempt on your iOS device.

Facebook sells data it collects as users take advantage of the Facebook service. People indicate approval of things like videos and messages by "liking" them. This quickly gives Facebook a great deal of information about the preferences, interests, and habits of its users. The data is useful to many different corporations. In effect, you are the product. Businesses also take advantage of its popularity and extensively advertise on the service. The more Facebook can succeed in constantly keeping people using their service, the more money is made through advertising and sponsorships.

Overall, Facebook is currently doing a good job of making its app and website accessible to blind users. They're very

aware of their blind audience and eager to be known as an accessible service. Recently, they've started adding automatic descriptions to photos using artificial intelligence. You can hear them as you come to them in your news feed. To learn more about accessibility on Facebook, check out www.facebook.com/accessibility.

Facebook has decided to split the many things you can do on Facebook into two separate apps. Think of the Facebook app as your public presence. You can look at peoples' news feeds, or post messages or videos to your own news feeds, comment on what other people post, etc. You can also interact with any Facebook groups you're a part of.

Facebook Messenger is for more private communication between you and your Facebook contacts. It's quite a full-featured alternative to the far less complex Messages app provided by Apple. Now, we will look at each of these apps in turn. However, be aware that they have undergone radical changes as Facebook seeks to define and differentiate itself from competing social media platforms. These apps may change at any point in time. The best overall advice I can give is to explore thoroughly so you're aware of your options.

The Facebook App

As of late 2019, there are six tabs across the bottom of the screen. These are News Feed, Friends, Your Profile, Groups, Notifications, and Facebook Menu. All of these are important to become familiar with. Rather than exhaustively describing everything in each tab, I'll give an overview of what you can do there. You can take time to look around using VoiceOver and figure the specifics out as you need them.

News Feed

You start out in the News Feed tab. Here, you can view your feed as well as the feeds of your friends. Any stories, photos, videos, etc. can be interacted with. Flick left and right through the various posts. A post will be automatically fully read without you having to do anything as you flick onto it. But wait. To read a post more carefully, double tap on it with one finger. This lets you read it, making use of VoiceOver gestures. Also you can see how other people have commented and reacted to the post. Double tapping with two fingers takes you to some quick ways to react to the post. Also, flicking up or down on a post will go through a menu of options. Have VoiceOver Hints enabled so that you can take advantage of all of the helpful hints Facebook has included. Near the top left, there are

buttons for using your camera, searching through feeds to find items of interest, and much more.

Friends

This tab is all about responding to friend requests made by others, as well as finding people you may wish to request friendship with. You'll find a People You May Know heading, beneath which is a list of people Facebook considers it likely that you might want to interact with. Near the top, you'll find buttons to filter requests and who appears within this tab. For instance, you may remove people from the group Facebook suggests you may want to be friends with. Invitations to groups or events may also appear in this tab.

Your Profile

Here is where you can create and edit your Facebook profile. This consists of information about you that others may or may not be able to see depending on your privacy choices. You can use your device's camera or a photo in your collection to add to your profile. This is a common practice among sighted people and will allow them to recognize you more easily.

There are different sections to your profile including public information that everyone can see, plus many other things. You can do far more than simply write a brief autobiographical description. Adding in details like your home

city, schools attended, and other details will let other people who you might wish to contact find your profile more easily. It will also give Facebook's friend-finding algorithm more information to work with, resulting in better recommendations. Be certain that you think through what information you reveal to people. The options to take firm control of this are there, but few people take the time to learn what they can do in this area. Remember that your profile is not the same as your account, which is always private.

Groups

In addition to friends and family, Facebook also offers extensive facilities for groups of people who share common interests. The Groups tab is where you can discover groups to join, create them, and invite others to join. You can post private messages to group members that nobody outside the groups may read. Additionally, you may start group chats and post events that others may indicate whether they can attend.

Personally, I don't do a lot with groups. I belong to one open to those who attended a school for the blind. They schedule chats that take place on Skype, as well as hold group conversations about topics of common interest. There is also a group that was started as an offshoot of a show on CBC Radio called "Now or Never". Its purpose is to allow members to

encourage and help each other with various dilemmas and problems in life. The name of this group is "You Got This".

Notifications

This tab contains any notifications awaiting your attention. These can be any posts made to groups you're a member of, event invitations, and reminders from various apps connected to Facebook you may be using. You can flick left and right through the various notifications and double tap on them to interact with them and read more closely. This opens up any previous related notifications. From there, you can flick left or right to view different notifications related to the most current one you double tapped on. Flicking up or down while on a notification gives you a menu of options such as liking, commenting, etc.

Notifications all gathered in one tab like this are especially useful if you don't check Facebook very often. Finding Facebook somewhat cumbersome, I fit squarely in this category of people who grudgingly pop in every now and then. The Notifications tab has alerted me to a good many events and other things that I might easily have missed without it. This holds particularly true for inquiries, messages, and other things directed at me personally.

Facebook Menu

This is a very packed place. You can flick through the options and also use the rotor to flick between headings. Also, you can do three-finger scrolls up or down to quickly move through the contents of the tab. This area lets you access all sorts of otherwise hidden places and settings in Facebook. There are options and things in here including apps, games, shortcuts, and more. The most important thing to be aware of is the settings. These let you customize many aspects of how Facebook behaves.

Facebook Messenger

Facebook wanted to have an app that competed directly with other messaging apps from other social media platforms. It, therefore, created the Facebook Messenger app for audio and video communication between closely associated groups like friends and family or business employees. The original Facebook app focusses on more widely shared communication.

There are three tabs across the bottom. They are Chats, People, and Discover.

Chats

Everything in terms of controls is at the top of this tab. The Settings button is at the top left. You will also find a button called Camera, which lets you share photos. A search

field lets you look for specific users or words within chats. There's a New Chat button, allowing you to start a chat. The rest of the tab contains any chats you may be involved in. They are in chronological order based on the latest communication. Explore the Settings button contents. There are all kinds of ways to configure Facebook Messenger.

While you're inside a conversation, you have numerous options. Near the top of the screen, you'll find options to initiate audio or video calls with other participants. You'll find messages in a chronological list going left to right with the right end being most recent. After these messages, there are more options like an audio composer, media picker, camera access, and others. There are also options like waving at other participants. It's a busy space in terms of options.

People

This tab is for dealing with all of your contacts. Also, you can add new contacts. Every option is at the top of the screen. There are buttons to change your view between all contacts and those active on Facebook. You'll also find a search field to quickly find the person you want. Below these buttons, you'll find a complete list of your contacts in alphabetical order. The rotor is your friend again, since you can set it to headings and flick up and down between letters. Double tap on

the contact you want, and options appear for contacting or editing the contact.

This tab is where you can block people who bother you on Facebook Messenger. To do this, open a conversation with the person you want to block. Double tap on their name at the top of the conversation, and you'll find an option to block them. Blocking someone in Facebook Messenger stops them from sending messages but is different from blocking them on Facebook. to do that, use the Facebook app. It is also possible to unblock messages should circumstances change between you and someone who has bothered you.

Discover

This tab concerns itself with activities and advertisements that you might choose to take part in. There are all kinds of games. Also, businesses have Facebook pages that may show up here. This is particularly likely if your friends have expressed interest in what's on offer. Many of these will be more visual in nature. However, people who are interested may find this tab to be worth exploring.

There is a button called For You near the top as well as one called Recent. Below are a whole bunch of links to pages, apps, and games.

Social Media Conclusion

Every so often, as a single unemployed fellow, you find yourself facing a long holiday weekend when it seems like everyone else has people to be with and somewhere to go. That was the case for me on the Thanksgiving weekend of 2010. Three days of everyone else being busy and elsewhere. Three days of absolutely alone time with no reason to go anywhere. For people leading hectic busy lives, that's often described as paradise. If, however, you feel like you've tried absolutely everything within your capabilities to contribute meaningfully but nobody seems to care, that kind of empty long weekend can be soul crushing. No amount of solitary entertainments can fill the gaping hole left by having no friends or a partner to hang out with. If you're lucky, they might be engaging enough for you to forget your solitude for a while.

By Sunday evening, I had reached the point where there was literally nothing else to do but look in on social media before turning in. I decided to check Twitter on the off chance that someone who I followed had actually tweeted something interesting. That happened surprisingly more often than I initially thought it would. Being on Twitter, you would learn about the lives and concerns of the people you followed a little bit at a time. Eventually, much like dust in a room, these

little pieces of thought ranging from what they had to eat for lunch to some casual observation typed out just after the thought was formed, would build up over time into something quite meaningful. And then, one day, you'd come across another tweet from a follower and realize that you truly cared about how this person you had never met in real life was doing. You found yourself responding and making an effort to express your own thoughts or cheer him or her up or share a hopefully helpful bit of knowledge.

My friends had basically pressganged me into getting with the times and joining up. I was still pretty skeptical about how meaningful one could possibly be when tweets could only be 140 characters long. Looking through the timeline of tweets from people I followed, I was rewarded. Heather, a friend I knew back in secondary school, tweeted that the first trapped Chilean miner was coming up. I checked the timestamp on the tweet. It was only a couple of minutes old.

A group of miners had been trapped underground for weeks by a collapse. I had been fascinated by the unfolding crisis in the news. However, it had reached a point where no new developments seemed likely for months as people tried to figure out how to rescue the men. I didn't know that a rescue was at all imminent. Thanks to Heather's announcement, I was able to tune into CP24

in time to hear the first miner be freed. Hearing that happen was nothing short of incredible. You could feel the triumph of the Chilean crowd as the first man was lifted from the cave in a specially built rescue capsule. I stayed up late to hear the first few get pulled out. I had been reflecting a lot on how disconnected and fragmented we were all becoming; wondering if there was really any hope for me finding a genuine life partner at all, starting to doubt whether my projects would ultimately do anything other than pass lonely time and make me feel productive. The latest episode of Spark on CBC Radio had gotten me thinking on how little people seem to watch in common other than perhaps sports. We all seem to be on our own little islands. And then, Twitter plus a friend I'll likely never physically meet again, got me on the same page as the rest of the world. My timeline was suddenly filled with cheerful tweets as people discussed the events happening on my own TV and so many millions of others. Thanks to Twitter, I could join in this conversation as readily as anyone else.

Hearing the rescue was just what I needed to put things in perspective. For a while, at least, it restored and recharged my sense of patience and hope. That's a big part of the connective power of social media. After that Thanksgiving long weekend,

I've never been able to think of Twitter with quite the same sense of derision. Through it, I was profoundly moved.

Sometimes, we get so buried in our own misery that we lose a proper sense of perspective. You get so absorbed in your own life that all else fades. Prior to that Sunday night, I wasn't all that impressed by Twitter, Facebook and the like. So much of what was posted seemed so very trivial. However, as time passed, that powerful experience became one of many. When the Fukushima disaster happened, I found out that a Japanese follower I had was stranded across the city from his wife. The phone lines being jammed, it took quite some time before he could even find out that his wife was thankfully alive and safe. Another follower living in Egypt was caught up in the events in Tahrir Square, which toppled the dictatorship. Others have tweeted about tornados, fires, and other disasters. Equally as important, you get a sense of the good things that happen to people all over the world. Every now and then, you might know something that can make a big difference to someone. I have experienced this particular joy many times now. Personally, I find this incredibly helpful when it comes to keeping a healthy perspective of my own life.

I have also experienced some lighter forms of negative social media experience. People have taken remarks I've made

completely out of context. Moments of flippancy on my part have given unintended offence to people. Of course, there is the ceaseless deluge of disagreeable spam from advertisers and others with unkind political agendas, to put it mildly. Keeping a degree of emotional detachment is a very helpful skill if you want to avoid getting sucked into often circular hopeless arguments with people who seem to live for troublesome drama. The best and worst of us is on full display. Despite all that roughness, I for one plan to stick around and try to do some digital good. I hope that you'll keep a level head, take sensible precautions, and perhaps join in building a better social environment. I'll keep an ear out for you.

Maps, Taps, and GPS Apps: Getting Around the Real World

Independent travel and gaining awareness of what's nearby have been tremendous stumbling blocks for me in life. A lot of that difficulty is due to what caused my blindness. I was born prematurely. Doctors followed what was then a common practice of providing extra oxygen to keep me alive. This oxygen certainly had that beneficial effect. However, it also destroyed my retinas and damaged part of my brain responsible for geospatial awareness. Solving spatial puzzles, comprehending geography and geometry, and keeping routes and mental maps have all proven impossible for me beyond a certain level. Things are now complicated further by moderate hearing loss requiring me to use hearing aids. They're very helpful when it comes to hearing things happen in my immediate vicinity and participating in conversation. However, they don't give me a reliable sense of distance and direction to sounds. Too much background noise or wind can render me unable to navigate or do much of anything safely. Increasing the volume often only makes things worse, as everything including background noise is amplified. Even walking through relatively quiet parkland, I've had many occasions where people have suddenly appeared in front of me when it was too late to move around them. They weren't standing still or walking especially quietly either. All of this is very unsettling when

you've been accustomed to hearing everything effortlessly for most of your life.

I thought it was vital that I explain these circumstances to you before discussing the navigational options your iOS device makes available so you can put my thoughts in proper context. I have used an app called BlindSquare quite extensively and have done more limited exploratory testing of other apps I'll discuss here. Just be aware that this is one section of this guide where I'll be relying more on what the app makers say the apps can do and on what I've heard other people's experiences have been like. For a number of my friends, these apps are all they need to feel very confident in exploring their surroundings and going to new places completely on their own. For me, they are more helpful in finding out what's around me than actually getting to places. Using them, I can at least be confident of eventually getting home unassisted if necessary. That in itself is quite a marvelous relief.

Having access to GPS navigation doesn't solve all of the mobility and orientation problems for any blind person. Nor does it replace the need for a cane or guide dog and good mobility skills. These apps don't use your device's built-in camera to gather information and aren't aware of what's happening around you. They won't warn you of oncoming cars, bikes, or other

hazards. They receive a GPS signal from satellites orbiting the earth and match what's detected to information stored on your device or retrieved from online sources. The information may not always be fully up to date. Businesses close or change locations. Any objects such as benches, garbage cans, etc. that you might put into the information as personal points of interest to keep on track could be moved. GPS signals can be blocked by structures, cloud cover, and other things. Defence department regulations don't allow civilian GPS receivers to be as accurate as technically possible. This is to prevent them being used to precisely guide weapons. For all these reasons, it's not a good idea to completely rely on it. Use your own senses and commonsense.

To help offset these difficulties, GPS apps may draw data from more than one source. Your iOS device can also tap into information received via the Internet and cell towers to help figure out where you are. Provided you are connected to WiFi, these apps are even useful to owners of iPads, which don't come with GPS receivers included. These receivers can be bought separately, so it's perfectly possible, if somewhat more awkward, to use these apps with iPads while moving. While stationary, iPad owners can examine maps and virtually explore areas prior to going there, exactly like they could on iPhones.

In fact, some people may find the larger size of an iPad helpful when exploring maps.

Using these navigational apps takes a toll on your battery. As you move, the app constantly tracks your position indicated by the received satellite signals and checks for things to notify you of against available information. When necessary, it will check for and download online information, presuming this is possible. All of these activities require processing power. You may also incur data charges if you go over what your cellular data plan allows for. To minimize this, download any maps, points of interest, etc. to your iOS device while you're connected to WiFi. Check the settings for the apps you use for possible ways to govern the circumstances under which data is downloaded. Investing in an external power bank is also a very good idea for people making frequent use of GPS apps.

Another thing to consider investing in is a means of hearing information conveyed by these apps while on the move. Some people hold their iPhones in their hands while travelling. This can be useful, as it allows you to point the top edge of your device in directions of interest and make use of the "look around" or "geobeam" features common to GPS apps designed for blind people. This tells you what lies in the direction your device is pointing to. Most people that I talk to prefer to have

their iPhones in their pockets and use small Bluetooth speakers, earbuds, or bone conduction headsets to keep informed while their hands are free for other duties. Some apps offer support for use with Braille displays. I've never attempted this but would presume these displays would be small and light enough to wear around the neck or over the shoulder for easy access while on the move.

There are two types of apps we'll be discussing here. The first kind are apps that are made for use by the general public and are also made accessible for blind people. There are a great many choices here. We'll look at the two most popular ones. These are the Maps app that comes included in iOS, and Google Maps, its primary competition available free from the app store. We'll also look at some apps for the general public that seek to aid their users with aspects of travel. For instance, there are apps that focus specifically on travel via public transit systems. Other apps such as Uber attempt to facilitate travel by connecting would-be passengers with people willing to take them in their personal cars for a fee. Other apps help with more long-range expeditions, booking flights and planning itineraries.

There are also a number of GPS apps designed specifically for blind people. These apps try to offer extra information that

is helpful for blind users as well as facilities to help make orientation easier. Again, we'll focus on the two most popular of these apps in North America at least. Neither of these apps was free when I began work on this section of the guide. In fact, one of them cost over \$100 Canadian when I acquired it for research purposes. It takes extra effort and expertise to make apps that are as maximally built for blind people as these specially designed apps are. They typically combine functions of two or more apps into a more seamless single app, provide information tailored to be maximally helpful for blind people, and are designed with efficient accessibility from the ground up. It can be a lot easier to master the use of one of these apps than to juggle two or more apps designed for sighted people to gain similar information that is by nature more minimal.

One thing you should always keep in mind when using any of these apps is that they are designed around car travel. Points of interest included in the maps and data these apps draw from will be located at parking lot entrances or driveways to places. When an app tells you that you have arrived, you'll still need to find the actual entrance to a place. Nothing stops you from creating a point of interest precisely at the doorway or path you need to be at. However, it is up to you to perform this task and create the position markers helpful to you. It's a good

habit to get into. Just be ready to still possibly have to search a little if there's GPS interference. Don't ever presume exact precision. Also, keep in mind that when you're told that a destination is a distance away at such and such o'clock, that's as the crow flies. In other words, it's a straight line to your destination that doesn't take into account obstacles you'll have to cross or get around.

You might wonder what kinds of special facilities and capabilities navigation apps designed specifically for blind people might have. Users of BlindSquare who wear earbuds or headsets will notice that the indicator sounds that immediately precede being told about points of interest are directionally positioned. You'll hear the indicator beep in the direction the point is located from your position as much as this is possible. Another often used example is upcoming intersections. Apps designed for blind people will typically give more detailed information about these before a user reaches an intersection so he or she has a better idea how to safely cross it. Those are just the tip of the iceberg.

Rather than going step by step through the features and operation of each app I discuss, I have chosen to concentrate more on what these apps make possible and when they might be advantageous. There is excellent help available for each of

these apps already. I see no advantage in reinventing the wheel. You can also find audio and video reviews and demos. I feel more comfortable leaving you in the hands of this expertly written help than trying to explain what I haven't used extensively. Your safety might hinge on being familiar enough with an app's capabilities so that you have the mental space to focus more on your surroundings. Presuming you've read previous sections on using VoiceOver, browsing the web, etc., you'll have the skills needed to master these navigation apps using the help provided.

Going Mainstream: Using Apps Designed for Sighted Users

Thin, light, and portable, it's no wonder that iPhones and iPads have been turned into powerful navigation aids by clever app developers. Many apps designed for sighted users have been made accessible to blind people using VoiceOver. This has been done thoughtfully. However, blind people simply aren't the core focus for these apps. Information these apps provide is designed to give maximum aid to drivers and other people with sight who can quickly look at the screen while on the move. They have been set up to be operated as easily as possible by people with sight. In contrast, apps designed especially for blind people are carefully crafted to give extra information and easy control by touch gestures or audio menus rather than tools found at a glance. This can make quite a difference. For a lot of people,

the Maps app or Google Maps will be quite sufficient to their needs as blind travelers. One major difference is that mainstream apps don't volunteer as much information. You need to use VoiceOver and seek out what's nearby or find out how far away places might be. Other than directions to destinations, sighted people typically wouldn't appreciate being told about everything they're passing as they move along. You'll need to have a good grasp and proficiency with VoiceOver to make effective use of these apps while travelling. You'll need to take your iOS device out frequently if you want to consult a mainstream app for information other than spoken directions that comprise a route.

As accessibility awareness and disability laws have taken hold, a lot more attention is being paid by developers of these apps to the needs of blind and visually impaired people. Both the Apple's Maps app (included in iOS) as well as the Google Maps app have done substantial work to increase the usefulness of directions and route instructions especially for blind users.

Apple Maps

The Maps app is designed by Apple and comes already on your device as part of the iOS operating system. It taps directly into data maintained and collected by Apple. It isn't supported by ad revenue of any kind. It is a service meant to enhance the

value of Apple products. For people concerned about privacy, this may be a better fit. You can view maps of areas and get directions to places. Apple is also integrating the Maps app with other apps like Uber and Lift to provide maximum convenience. It also supports Apple Pay and Siri. I recently heard a video that pointed out that the pricing information and ride booking procedures were better in the Apple Maps app than in Google Maps. In an effort to rival Google Maps, Apple is investing a lot of resources into collecting geographical data. This new data is slowly being added to the Maps app as it is ready. This includes indoor maps of popular places like shopping centres and airports.

Apple Maps lives up to its name. The screen is dominated by an interactive map. Blind people are actually able to explore this map by dragging their fingers along roads. They can also use the VoiceOver rotor to flick up or down between points of interest, double tapping on an item to open an information card about it. You can choose how much of the screen is taken up by these information cards. You also have current local weather, a Tracking button, and a Settings button.

The information cards have quite a bit of material on them drawn from various apps as well as the address. You will also find buttons to get directions or call or visit the website of a

place. If an app is associated with a place, there's a button to get that. Apple really plays to that strength of integration. The information cards are where that's most evident.

Moving your finger around the screen allows you to explore the area around you and even follow streets. You can also find out about any nearby points of interest via the rotor by turning it to the Points of Interest setting. Flick up or down between points of interest and double tap on any that interest you. It is also possible to mark points of interest on the map.

The Maps app is a springboard for many other apps that can incorporate aspects of maps into travel aids. This might allow an app focused on restaurants to offer the ability to give guided directions to a restaurant or show a map of where it is. It also allows Siri to give guided directions to places of interest when asked. You might never go into the Maps app itself but will still very likely have made use of it without even being aware.

To find help using the Maps app, the first place to look is inside the user guide for your iOS device. You can get the user guide from the Books app. I've given instructions on how to do this in the Quick Start section of this guide.

Google Maps

Google is, and has always been, the information king. This is leveraged heavily to provide maximum contextual knowledge about places. Apple initially was going to simply tap into Google's data and pay for using the information on its products. However, the companies had a falling out and are now competing with each other in this particular sphere of interest. The map is almost secondary to the information in Google Maps. When you enter it, you'll find a Menu button, a search field, and a bunch of further options including checking traffic, getting directions, and entering compass mode. Below, you'll find a heading called Explore (your local area name). In my case, Explore Mississauga. Flicking right below that heading brings you to buttons that are categories of places. Double tapping on one will show you local places in that category. For instance, double tapping on "coffee" will bring up places where you can enjoy coffee nearby. When you drill down like this, there will always be a Back button to get up to a higher level.

If you double tap on a location in Google Maps, Google finds and displays everything from the website, buttons for guidance to the location, a button to call a place, and all kinds of reviews provided by users of the app or from other places. You can learn a great deal about restaurants and places

of business just from what comes up on a place's information screen. Don't forget to scroll down with a three-finger swipe to the left. There are usually a number of screens full of information. More than you'd get on Apple Maps.

Google Maps has a lot of features including a compass mode as well as the ability to download a local map for offline use. If you use this latter option, be aware that some features depend on having a data connection, and you'll miss out on those if you're completely offline. All of this is explained in the app itself. To find the extensive help available from within the app, double tap on the Menu button at the top left. Next, flick right until you come to Help and Feedback. Double tap on that and then flick right until you get to Help and double tap this. You will arrive at a web page with extensive help and instructions.

If you use other apps in the Google ecosystem, you may find that they can interact with Google Maps when this is advantageous. This certainly includes any Google searches you'd perform with the Google app. This app is supported by businesses and advertising. You may encounter ads while using Google Maps if you thoroughly explore the information provided. Also, keep in mind that Google and Apple have different philosophies when it comes to privacy and sharing data. With Google, the data you

generate is a product for businesses and other interested parties who have agreements with Google.

Google Maps also has facilities to make sharing information such as possible locations easier using social media, messaging, or email. This can make working out what restaurant to meet up with friends at easier. People can look at reviews, visit the website, and access the menus that restaurants make available online. This can be extra helpful for blind people, since it provides a menu that you can examine without someone sighted having to read it to you. This way, when your friends are ready to order, you can be too.

Optimal Perspective: Using Apps Designed for Blind Travelers

While it's certainly quite possible to make good use of the Apple and Google Maps options, there are alternatives that have been designed from the start with blind users in mind. They tap into the same sources of data as other mainstream GPS apps. However, they present information in ways to maximize the benefit to a blind traveler. For one thing, they announce nearby points of interest and other information automatically. You don't have to constantly interact with the app to find out what's around or how close you are to an important landmark. What's more, the interfaces of these apps have been thought through very carefully to make them as easy as possible to use

from the perspective of blind people. This can make a very big difference.

There are numerous GPS apps designed specifically for blind users. They are more likely to cost money, unlike the mainstream apps we examined previously. There are a number of reasons for this disparity. For one thing, there are research and development costs associated with making these apps as easy to use and beneficial as they are. The potential user base for these apps is a lot lower than apps designed for sighted users. This reduces how attractive they are to advertisers and other ways that enable mainstream apps to be free to their users. There are often fees for developers of these apps to make use of the geographical data they tap into. Rather than having consumers pay an ongoing subscription, many developers choose to charge a higher price for their app up front and absorb the ongoing fees.

We'll look at the two most popular apps in this category. Remember that there are other choices out there. We'll briefly examine two of these in an app store expedition later on.

BlindSquare costs \$54 Canadian in the app store. It's a very popular option with a loyal following and frequent updates. Meanwhile, a more recent arrival from APH called Nearby Explorer bills itself as the premium navigation app for blind travelers.

Recent changes to iOS as well as a key source of offline map data becoming unavailable have prompted the American Printing House to begin phasing out the paid version of this app. People are now encouraged to obtain the Nearby Explorer Online app, which is available free of charge from the app store. Over the next while, the capabilities of the Nearby Explorer Online app will be increased to match those of the paid version of Nearby Explorer with the exception of the Navteq offline map data, which needed to be licensed. A major reason for the high cost of the Nearby Explorer app was in fact the cost of having continuous access to updates to the Navteq maps. Now, it is possible to download information for needed regions from OpenStreetMap for use while offline. This open-source information is used by many GPS apps and is updated constantly by users. This drastically lowers the cost to maintain the information and keep it current.

I won't be going too deeply into how to operate these apps. In both cases, you can find a very detailed user guide right from within the app. The guides are also available online at the websites for BlindSquare and Nearby Explorer. Go to www.blindsquare.com for help using BlindSquare. You'll find all kinds of help including podcasts demonstrating the app,

frequently asked questions, a link to contact the developers, and the user guide.

You can visit American Printing House to get similar resources for Nearby Explorer. Go to www.aph.org.

BlindSquare

BlindSquare is an app that leverages data from the Foursquare database. Foursquare is a social app and game that lets people check into places they visit in the real world, telling people where they are. They can earn badges for visiting places often or visiting many places in areas, being certain to check in using the Swarm or Foursquare apps when they're present. They can also rate and review places. This data is tapped by BlindSquare to find points of interest so that it prioritizes more highly rated and popular locations when they're in your area. It also draws data from the OpenStreetMaps service, which provides information about streets, paths, intersections, etc. Combining these two sources gives a very useful picture of your surroundings, which is constantly updated by people checking into places and uploading GPS coordinates.

Rather than taking up space on your iOS device with preloaded maps and a geographical database, BlindSquare frequently checks for data as you move. Nothing is stored on your device other than points of interest that you create. As a

result, BlindSquare takes up a small amount, around 100 MB of storage space, on your device. This small footprint makes BlindSquare quite manageable even on devices with low storage capacities. Especially considering what you're getting in terms of capability. You absolutely need cellular data to make use of this app while travelling and not connected to WiFi. It regularly checks for new points of interest to report to you as you're moving around.

Using BlindSquare, blind people will be alerted to points of interest that come within a radius in categories of interest that they can specify. It is possible to filter what BlindSquare announces so that there is time to hear more of what's around you and what you're actually interested in. For instance, you could have it only announce restaurants within your search radius. By default, all categories are active and BlindSquare tries to find the most popular and closest places to tell you about. Being able to focus in on what you want is a key capability.

Another special capability of BlindSquare is the ability to use 3D sound if you use a headset to sonically indicate the direction of points of interest it tells you about. As you walk along, you might hear a short beep sounding like it's ahead and to the right. That will be immediately followed by an

announcement of a doughnut shop that has been detected. There are many other short audio indicators that can clue you in to where things are whether or not you use a headset and perceive the 3D positioning or not. This has come in very handy for me when navigating the path around the man-made lake near my apartment. I have added in benches, large rocks, and other points of interest that make good landmarks, and hearing the direction they're in as I approach has enabled me to find them more easily after I've become disoriented.

You can also access and control most capabilities via an audio menu that you access with the Play/Pause button on your headset. This allows you to have your phone safe in a pocket and still control most of the tools BlindSquare offers. To access this menu, simply press the Play/Pause button of your headset or earbuds. A menu of options will then be cycled through and announced one by one. You merely use the Play/Pause button again to indicate your choice. This simple and consistent interface lets you easily adjust the radius, activate sleep mode while you stop and talk with someone, find out what's around you, announce where you are, etc.

You can also use voice commands to control BlindSquare. This is similar to asking Siri or another digital assistant to do something. There is a list of commands specific to

BlindSquare, which you can find out about by asking the app for help. Using this feature costs you command credits that you must purchase from within the BlindSquare app.

The app has been designed for maximum ease of operation using VoiceOver and was extensively tested by blind people. It can also give information from beacons that may be placed in or outside of venues. The CNIB Community Hub in Toronto has such a beacon.

BlindSquare also has a Look Around feature, which lets you point the top edge of your phone in a direction and find out what's there. There are options to get weather information about a place, an option called What's Around Me that announces nearby points of interest, a Nearby Intersections option, and many other options. For instance, when visiting a restaurant, you can call the place, get directions via a third-party app, view the menu, and much more. You get at these options by double tapping on the location whether it's in your favourites or in a list of search results. BlindSquare has also been designed to work with Braille displays. You would presumably wear a small Braille display in a sling bag, having it on your chest or over a shoulder for easy access.

BlindSquare packs everything onto one screen and into menus accessed from that one screen. At the top is a toolbar featuring

buttons to let you access tools, settings, and other features. Beneath that row of buttons at the right edge of the screen is a radius adjustment slider. This lets you quickly increase or decrease the area around you being checked for landmarks or that will be used during searches. Below this are a plethora of category search options as well as a button giving access to announcement filtering. This lets you fine tune what is announced as you move around. The more familiar you are with the layout of this screen, the better your experience will be while on the move. It is absolutely possible to flick through all the options but so much quicker if you have a rough idea where they are and can touch a point on the screen that is close or right on the option. At the bottom of the screen are other options including the Sleep Mode button near the bottom right. This lets you put BlindSquare to sleep during a conversation with someone or while you don't want it checking for information and announcing things.

You can go into the Tools button and then flick through to reach options such as Look Around. If you're wearing a headset, you would more likely take advantage of the audio menu by using the Play/Pause button on your headset. Options would then be spoken and you'd just hit the button again when the one you wanted was spoken.

BlindSquare cannot plan routes and give turn by turn directions on its own. However, it has been designed to interact with other apps operating in the background while using another app like Waze, Google Maps, or the Maps app that comes on your iOS device, etc. These apps can be given coordinates by BlindSquare and can then plan routes and give directions. BlindSquare can also hook up with transit apps like Transit or Moovit and give information such as bus stop and arrival times. Tying into these apps, BlindSquare can provide quite a comprehensive navigation service, making things as easy as possible for blind people. That's because it can run in the background while other apps have focus. You need to give permission for BlindSquare to be able to do this.

Recently, BlindSquare has partnered with the new Aira service discussed in an earlier section of this guide. Users in supported countries like Canada, the US, and others, can be alerted to nearby locations where Aira is available free of charge. It is also easy to call an Aira agent from within BlindSquare and receive help via your iOS device's camera or smart glasses if you're wearing those.

Example of Travel Using BlindSquare

I find that BlindSquare is what I turn to for when I'm walking around my local area. Once I had the app, I got a

mobility instructor to walk with me around the path that encircles the man-made lake near the building I live in. Around the path, there are a number of benches, garbage cans, paths leading in other directions, etc. As we came to suitable landmarks, I stood as near as possible to them and added them to BlindSquare. I didn't set them as destinations, so they don't clutter up my menu of those. However, they are announced automatically as I approach them. I am, therefore, warned of both bridges on the path well before I come to them. These are somewhat narrow crossings of small creeks, so I know to slow down and make certain there's room for me to cross safely. There are enough landmarks recorded so that I can quite quickly tell when I go off the path. My apartment is also marked in BlindSquare, so I can determine how to head towards it and return home.

July 1st is Canada Day. There are fireworks lit off in a park on the path around the lake. Prior to getting my first GPS system, I couldn't attend these events on my own, since the chance of getting lost was too great. However, I knew that with BlindSquare, I could find my way home even without sighted help. I had the confidence to head out into the night using BlindSquare, which announced the landmarks I was passing while I walked along. I wore my Aftershokz bone conduction headset, so I

was alerted to landmarks while being able to listen for people or other things in my environment. The night was quite enjoyable and I had many interesting conversations. During these conversations, I used the audio menu and activated sleep mode so that BlindSquare wouldn't keep speaking while I was trying to engage in conversation. When it was time to move, I merely turned off sleep mode and quickly began receiving information from BlindSquare. When it was time to head home, I set BlindSquare to track the entrance to my apartment complex off of the path around the lake. It periodically announced how far away it was and in what direction as I walked. This information was enough to help me get back home and avoid straying off the circular path around the man-made lake.

When I have friends over, I often take them to a Symposium Cafe, which is a restaurant in a local mall. BlindSquare announces the many landmarks along the route as I walk from my apartment. Once I'm there, I can also access the restaurant's menu from inside BlindSquare. While this menu isn't always kept as current as might be wished, it gives a good idea of what kinds of things are available. I can then put BlindSquare to sleep while having my meal and then wake it up when I leave the restaurant so it can help me navigate home.

Nearby Explorer Online

The American Printing House for the Blind (APH) financed the development of this navigation app. It has been available on Android devices for quite some time and had garnered quite a good reputation before making its way to iOS. While both the BlindSquare and the Nearby Explorer Online apps make use of the same sources of map data, they differ sharply when it comes to the user interface. Nearby Explorer takes a very different approach than BlindSquare.

At the top and bottom of the home screen are two toolbars with frequently used options. The top toolbar contains buttons for Pause, Compass, Geobeam, Radius, and Level Adjustment. The Geobeam feature is like the "look around" feature in BlindSquare. The bottom toolbar has buttons for Streets, Search, Favorites, and Transit Information. In-between these toolbars are a number of indicators that can be set to automatically announce information or not as desired. For instance, you can have street numbers announced or not. All of these options have context menus providing even greater control of when they are spoken or not. This gives you the ability to quickly tailor the feedback from Nearby Explorer to best suit your current situation without ever leaving the home screen of the app.

There are four tabs across the bottom of Nearby Explorer for accessing less-frequently used features like Settings, Help, and an accessible map view. This map view comes from integrating the Apple Maps view into the Nearby Explorer interface. This means that you can use Nearby Explorer's home screen settings to determine what gets announced on the map. You can also do things like simulate being in a location, turning on a "watch" on a location on the map and then scroll around while hearing where you are relative to the marked location. You could also use features like the geobeam to explore areas before actually going there in person. People might well prefer Nearby Explorer's tabbed approach that more thoroughly separates those less-frequently used options, giving them separate areas of focus. It can be a lot easier for people to master more features when things are consistently done in one app. Procedures and the way things are presented are the same. When you deal with different apps, be prepared for different philosophies of what's important and how things are accessed. APH has thought through every piece of this app very carefully to maximize its usefulness specifically for blind people. That makes a big difference especially for people who might not be experienced enough to easily deal with too many different apps.

Reflections on Nearby Explorer Versus BlindSquare

We are entering a very fluid period when it comes to specially designed apps. Similar to what has happened in the area of mobile OCR apps designed to allow blind people to read printed pages, conditions have changed radically over a brief span of time. New and better sources of open-source map data are emerging that can be kept far more constantly up to date. users have more cellular data at their disposal, which further erodes the advantage of downloading gigabytes of geographical data onto their devices that quickly becomes out of date. Changes to iOS include major improvements to the Apple Maps app, which is what Nearby Explorer Online uses to offer an accessible map. Route planning was originally offered in the paid version of Nearby Explorer currently being phased out. It should become available in the Nearby Explorer Online app, which APH is encouraging people to obtain rather than the paid app.

When I began work on this section of the guide, Nearby Explorer was the most costly app a blind person was ever likely to obtain. It also took up a tremendous amount of onboard storage, making map data available even when offline. That was a main selling point. Now, given recent events, things have flipped. The Nearby Explorer Online app is freely available and will gain more capabilities over the next while as features only

available in the paid version are incorporated into the free app. Suddenly, BlindSquare is the app needing to justify its higher cost, especially as mainstream apps incorporate more accessibility and information helpful to blind users.

Apps are now all about clever design, information delivery, and user interface. Philosophies differ significantly enough that each app will prove attractive to different people. I think the answer ultimately boils down to personal preference, how much you pay for cellular data, and where you're travelling.

Personally, BlindSquare is powerful enough to meet my current needs. However, if I had to go to an unfamiliar city and find my way somewhere, I would appreciate having the OpenSourceMap data and other features of Nearby Explorer at my disposal. Beginners may find an app like this to be a bit overwhelming. You'll want to spend time reviewing the instructions and examining the options before making serious use of either of these powerful navigation tools. I don't find that Nearby Explorer Online does as well with off-road travel such as around a pedestrian path or in a park. I entered a bunch of landmarks in but could never get them to be called out as I passed them. Nearby Explorer Online tries to minimize the amount of chatter and doesn't have the same approach to places that aren't destinations that BlindSquare offers. However, it is able

to give better information about intersections, according to a friend who uses it extensively.

If you need to do a lot of urban travel in unfamiliar cities, I think the BlindSquare app would definitely shine and prove its worth. You would never be without geographical data, presuming you download the OpenStreetMap data for the region you're travelling in while connected. Nearby Explorer does make it far easier to quickly change what information is spoken, having everything you'd likely want to adjust rapidly right on its home screen. This includes such things as streets, transit information, and much more. BlindSquare makes you do a bit more work to achieve a similar adjustment in what you're informed about while on the move.

Don't worry if, like me, you aren't able to make good use of the virtual exploration capabilities of Nearby Explorer Online. This app has a tremendous number of navigation tools. Find what helps you the most and master those options.

App Store Expedition: Other Navigation Options

Ariadne GPS or Lodestone

For a couple of cheaper navigation apps designed specifically for blind people, consider Ariadne GPS or Lodestone. Ariadne features a map that is totally accessible with VoiceOver and can be explored by touch. This app has been

around for a long time and hasn't been updated recently. Another alternative that is still being updated as of 2018 is Lodestone. It is produced by blind developers and allows local information to be downloaded for offline use. It is much cheaper than the two apps I focused on above and was originally developed for Android smartphones. One particular advantage it offers is the ability to be far more specific about the categories and geographic regions you choose to store on your device. For devices with lower storage space, this is a very attractive capability, giving the best of both worlds and making certain you're never without local information.

TripIt

Other apps to obtain are not made specifically for blind people but may help with travel. TripIt is an app for managing the details of a trip. You give it information such as flights and hotel bookings, and everything is kept track of in that app. It offers numerous perks to frequent travelers and is said to be accessible for blind users.

Uber and Taxi Apps

For more local travel, consider obtaining the Uber app. Many taxi companies also have apps. These can help with ordering rides, make payment easier and more secure, and much more. These apps generally work well with VoiceOver and can be very useful.

Final Thoughts on Navigation

It's incredible to think of how much choice we have in terms of our approach to getting around. Even the more expensive options are, by a long shot, cheaper than the devices designed for blind people that I've heard of. If you take the time to get confident with using VoiceOver, you can have very thoughtfully designed accessible apps that do just as much as those more expensive devices. That iPhone in your pocket can be a life saver if you get turned around out there. BlindSquare has certainly helped me get back home when I've gotten disoriented walking outdoors. GPS apps aren't perfect, but they open up a lot of possibilities for blind people.

When you're not using GPS apps for a while, it's best to close them so they don't continue needlessly using data and resources in the background while you don't need them. I've had more than one occasion when I discovered I hadn't done this, and, therefore, had less remaining battery power than I thought. While travelling, please be mindful of how much hearing blockage and/or distraction you're incurring. Earbuds and over-ear headsets block your natural hearing to a high degree. There are plenty of reports of fully sighted people wearing these and failing to hear oncoming cars and other sometimes lethal hazards. Personally, I use a bone conduction headset while

travelling. I have the volume as low as possible while still being able to reliably hear information. I never ever play music while walking. The only thing I want to hear besides my environment and people around me are the navigational announcements from my GPS app of choice. Some people worry that their iOS devices might interrupt the announcements at a critical moment with something unrelated to travel like a notification that somebody tweeted you. I usually set my iPhone on do not disturb while I'm travelling so nothing else intrudes on the announcements and operation of my GPS app. This mode has become very flexible in iOS 12. You can add contacts to your Favorites list so you won't miss a message or call from people who are important to you even when in Do Not Disturb mode. Don't forget that while in this mode, your iOS device can still receive information. Just check the Notification Center when you get where you're going and find out anything you missed on the way. Normally, in the event that I need to make or answer a call, I'll move to one side of the path and stand still until the conversation finishes. I take as much responsibility for my own safety and that of others as I possibly can. Safe travels, everyone.

A Fond Farewell: Reflections on Our Journey Together

It's April the 22nd as I write these concluding thoughts. Happy fiftieth Earth Day to us all. Normally, it would be all over the news. Given the strange times we find ourselves in, I wasn't surprised that it barely got a mention on the evening news. The COVID-19 pandemic and its myriad effects on our lives is all that seems to stick in everyone's mind. When I started this project, I hoped that my efforts might perhaps add some enjoyment to your life. I thought some of you, thanks to learning about how many books are now within your reach, might read some that you had always wanted to read. Maybe, some of you would broaden your horizons and try a new game, watch a new show, or join in an online discussion. Perhaps, you'd share some of your own wisdom online by writing a blog or starting a podcast. Perhaps, you'd feel a bit safer walking to new places with the iPhone you now understand how to use. Those hopes are still with me. Now, I also find myself hoping that what I've written might help keep some of you safer, more mentally healthy, and hopefully more entertained than you might otherwise be in this strange new world.

We've at last arrived at the end of this guide. If you've actually read this whole thing, you have my profound admiration and thanks. This guide wasn't written with that kind of

persistence as the expectation. The idea was that people would skip around to what they were interested in or felt they needed at any given moment. I sincerely hope you have found it worth your time.

Creating this guide has been a much longer and far more exhaustive process than I had originally thought it would be. Over the past three and a half years I've worked on this guide, so much has happened. I'm concluding this project on a different iPhone than the one I started it on. A new keyboard sits under my busy fingers. Change is a constant in the iOS ecosystem. The goal posts just never stopped moving. Favourite apps have disappeared and new ones have come along. We've had three major iOS updates. All of these things have each forced me to re-write parts of this guide that I thought were all but finished. Some changes invalidated literally thousands of words of progress. One disaster I inflicted upon myself by deleting what I thought was an old unused folder undid months of work that I had to rebuild from fragments I remembered having done. One thing lacking in Ulysses, my writing app of choice, is the ability to generate a table of contents automatically. As a result, I had to quickly investigate and use Pages for the final step of creating an ebook with a useable table of contents. I hope I've shared enough of the history I've experienced as iOS has matured

over the past ten years to give you a sense of the kind of wild ride you're in for.

Ten years is long enough to have given me a real sense of history happening in this world built by Apple and those of us who jumped aboard their train. I've been honoured to have experienced works of genius that are simply no longer available. Through countless online conversations, I've witnessed a lot of tremendous creative good take place. People have reached out to help each other in wonderful ways using their iPhones and iPads. Please be a part of that wonderful world. Its results have a way of making the physical world and our lives in it more interesting.

Sadly, iOS 13 has turned out to be more buggy than I would ever have thought likely. We're not ending on as shiny a patch as I would have liked to. However, on the whole, I'm still very happy to have an iPhone and hope you'll reach the same conclusion. Everything I've been hearing indicates that more stable better days are ahead when people upgrade to iOS 14. Apple makes plenty of mistakes, but it does seem to learn from them. Rather like yours truly.

This is, by far, the largest single project I've ever undertaken. That saying about great art being abandoned rather than finished rings very true to me. A week of final edits and

countless small changes stretches ahead of me before I set this loose. I've included all of the wisdom and discoveries I could think to include. Making a decade's worth of experience available in a document is a very tall order. I wish that I had made this a collaborative project from a very early point. By the time I got to a place where I considered it, I was in too deeply to let go. To really do a complete all-encompassing job of this would take a team of people with more skill and varied interests and life experience. There's so much territory to explore with an iOS device. There are so many accessible apps out there and so much as yet untapped potential for developers to explore. I have many thoughts on this but absolutely no ability to implement them.

What a long way we've come together. From setting up your device, to online shopping, to using the camera, I hope you've gained a good idea of the large number of possibilities that exist for your iOS device in spite of only a fraction of the total apps created being accessible to blind users. You carry a lot of power in your hand or pocket. Please use that power to do good in the world. Your words, thoughts, and ideas matter. It's all too easy to lash out at imperfections that annoy us without having a thought for how hard it is to create that delightful

sense of ease we all should know better than to expect constantly but somehow do anyway.

Beyond realizing the possibilities of using your iOS device, I hope that I've also convinced you that the online world that it lets you access is meaningful and has substance; that it is worthy of your participation. For me, it has provided a place where I can be of real help to people and have an impact. It is a place where I feel that I have a voice. While I look forward to more adventures in the so-called "real world", I don't plan on turning my back on the good I can do in the digital space.

What comes next? Stuck at home as we all are, there's still a great deal to look forward to for me. I'll continue producing segments for the Kelly and Company show. As technology and audio entertainment items emerge, I'll help spread the word. I'm continuing my roll as deacon in my church as we all try to navigate how best to help our congregation and others here in Canada and abroad. I find my experience with online life is all of a sudden in greater demand for a good many people who are now forced to stay home and minimize physical contact. Cries of "He spends way too much time on that iPhone" have become "How do you shop online?" Perhaps, we can all come out of this with a more healthy, less paranoid perspective on technology and big data.

I had hoped to get together with friends and celebrate the completion of this project perhaps in a quiet pub where we could actually enjoy each other's company. Sadly, that will have to wait until such a plan wouldn't put people at undue risk. It will happen one day. We will conquer this pandemic. Meanwhile, a meal ordered in from a thankfully open restaurant, a couple of beers I've saved for the occasion, and a totally relaxing day of online conversation, books, shows, and podcasts I've put off enjoying while working on this guide will do nicely for the present.

Looking farther ahead, I hope to find more opportunities to volunteer where what I know can help more people. I have yet to really find that space and community where I truly best fit. Two larger creative dreams also beckon to me. I believe I've gathered all of the resources I need to take a crack at either of them. Ever since my days in secondary school, I've dreamed of writing a collection of loosely connected short stories. My other big long-standing creative dream is to create a widely enjoyable game. I've come to the conclusion that perhaps a roleplaying game would be workable. Slowly, I've gathered books and materials about writing, stories, and game design. While writing this guide, I've let these materials keep their secrets for the most part. I couldn't resist an occasional peek. All of

this material is on my iPhone, and the process of digging through it for treasures will soon commence in earnest. I thought I'd know which of those dreams to pursue first by the time I finished this guide. However, I'm no farther ahead on that front than when I started this project, putting the decision on hold. I guess we'll all just have to find out what my next step is together.

You now know quite a bit about what keeps me cheerful and fascinated. If you've enjoyed that process, I'd love to hear from you. Of course, I'm interested in what you thought of the guide. Has it helped you? Is there something you wish that I had thought to include? However, I'm even more interested in hearing about the adventures you have with your iOS devices. Perhaps, if there's enough interest and constructive suggestions, I might take a crack at updating this guide some time. Meanwhile, just as others have helped me, I'm happy to answer your questions if I can. I'm also just as happy to have a good conversation about life, the universe, and everything. Reach me on Twitter at "mfeir" without the quotes. Otherwise, there's email. Contact me at michael.feir@gmail.com.

Helpful Resources

Those who seek a different approach learning how to use their iOS device should take advantage of the resources listed below. All kinds of help is out there on the web. Also, many organizations offer training in the use of iOS devices. I've included as many currently available resources as I know about. These are in no particular order.

Apple's Accessibility Website

www.apple.com/accessibility

This is where Apple advertises its various efforts regarding making their products accessible to as many people as possible. There are accessible versions of product manuals. You'll also find descriptions of accessibility features as well as video demonstrations. There are resources for developers who want to make their apps as accessible as possible. You'll also find links to other online resources.

iOS Access for All

www.iosaccessbook.com

iOS Access for All: Your Comprehensive Guide to Accessibility for iPad, iPhone, and iPod Touch by Shelly Brisbin.

This book is a very comprehensive and concise guide that covers all aspects of iOS from an accessibility point of view.

This extends beyond blindness and covers all accessibility features in detail. Shelly is a well known and trusted expert in this area. She shares that expertise on numerous podcasts and has written articles in disability-related publications. Anyone seeking a more traditionally written guide to iOS would do well to spend the \$25 US cost to purchase her book. This is especially the case if you have more than one type of disability.

The CNIB

www.cnib.ca

Canadian National Institute for the Blind.

This charitable agency has a long history of working to improve the lives of blind people in Canada. It has recently begun the Phone It Forward program to help get more smartphones and tablets into the hands of blind people. They have also produced YouTube videos and ebooks, and also provide training workshops to instruct people on how to use their iOS devices.

The National Braille Press

www.nbp.org

This American resource offers a growing number of very helpful books in ebook and physical and electronic Braille formats. A large number of books focus on accessible apps and techniques for making the most of your iOS devices.

Get Together with Technology

www.gttprogram.blog

This initiative of the Canadian Council of the Blind provides online training conferences free for interested people to attend using the Zoom service.

The Hadley Institute

www.hadley.edu

This non-profit organization has been around for decades but keep moving well with the times. You will find free educational courses, information videos, and audio resources including material to help you master your iOS devices. People interested in learning will find plenty to occupy and enrich their lives here. All materials are offered free of charge.

Accessible Media Inc.

www.ami.ca

This organization promotes accessibility in Canada and offers a wide array of audio and TV programming. Much of this is directed at keeping blind and low-vision people informed and entertained. This includes audio community-focused shows like Kelly and Company, The Pulse, and the Now Show with Dave Brown. These shows encourage and thrive on community participation while bringing a great deal of expertise to bear on the everyday concerns for people with disabilities.

The Tech Juggernaut

www.ttjtech.net

Located in Pennsylvania, this business offers online training for Apple products and this training includes online courses in learning how to use VoiceOver. They frequently post announcements about various free courses and other offerings that may benefit people far beyond their state.

The VIPhone List

<https://groups.google.com/forum/m/#!forum/viPhone>

This list is full of people who use iPhones and other iOS devices. Any topic relevant to the use of iOS devices or apps is fair game for this friendly, high-traffic Google group. You can participate through email in your email app of choice or view discussions directly online from the Google Groups page.

The End