

THE OSIRIS METHOD

Starcraft 2 Strategy Guide

A Fast and Effective Starcraft 2 Training Program
Designed to Boost Your Ladder Rank Quickly



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Printable Practice Pages

As part of The Osiris Method training program, you may be asked to print out certain charts and pages in order to complete the practice regimen. Do not worry about the regimen itself just yet. Just know that this page exists and is found at the beginning of the book. When you are done reading the guide, you can reference this page when it is time to start implementing the practice program found within.

To print the charts, select Print, then enter the pages below for your specific race into the “pages” tab. This book is really long so you do not want to accidentally print the entire guide! If you do not have access to a printer, you can always copy these charts down by hand.

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Introduction

As a Starcraft 2 player and fan, I have taken great interest in Starcraft 2 strategy – that is the tactics, unit combinations, and timings that help players win games. I created a website in order to share these strategies with other players.

While feedback on the strategies was great, I noticed one problem: many players just never seemed to get any better. No matter how much they played, after a few weeks of playing, they stopped progressing ahead in the ranks and in their leagues. It is at this time that many players give up competitive play.

"Forever Gold"

This problem of non-advancement is so wide spread that it has become a joke of sorts in the Starcraft 2 community. "Forever Silver" or "Forever Gold" is the common saying used by players who have been in the same league for a long period of time, despite regularly playing. After a length of non-advancement, players begin to develop an aversion to playing ladder games. Husky, a popular Starcraft 2 commentator, has dubbed the phenomenon of players avoiding ranked games as "Ladder Anxiety". Starcraft 2 is a stressful game, and when you add in the frustration of not increasing in ranks, it becomes much less enticing for players that formerly enjoyed the game.

Non-advancement is a fun killer, but what really causes it? What makes some players advance to the top ranks of Starcraft 2, whereas others put in the hours of play but never get any better?

Fortunately, this problem has already been examined in other fields: notably music, the arts, sports, and even business. By taking the research, science, and experience that has been devoted to enhancing performance in these fields and applying it to Starcraft 2, players for the first time will have access to a reliable and efficient method for rapidly improving skill levels and ranks in Starcraft 2.

The Starcraft 2 Pyramid

Several variations of a "Starcraft 2 Mastery" pyramid have floated around the internet and are supposed to demonstrate the amount of time and effort that should be dedicated towards various aspects of Starcraft 2. These are typically generic topics like macro, micro, unit counters, army composition, economy, spell casters, build orders, and so on.

The problem with these pyramids is that they assume that everyone learns Starcraft 2 in the same manner. Clearly, they do not, as some players continue to get better the more they play while others never get any better. Something differentiates the way players in the Master's League (and beyond)

continue to improve while others simply track sideways in the same league game after game, week after week, even season after season.

The goal of this book is to provide a truly effective and efficient training program that will allow any player to rise to the top 10% of players with just 1 hour of practice each day. Players who want to spend even more time and effort practicing the strategies and exercises in this book will be able to advance far beyond the top 10% and may even be able to enter the Grandmaster League.

I understand such a claim is quite bold, especially for those who have spent countless hours playing games, watching professional streams, reading strategy guides, and watching tactics videos, but are simply unable to increase their rank. Fortunately, I guarantee this book is unlike anything you have ever read before on the topic of Starcraft 2. By understanding the way that the brain works, we can create very efficient and effective training programs for Starcraft 2. By following the practice drills outlined in this book, you will get better in marked and demonstrable ways: your APM will rise significantly, your builds will be tighter, you will max out sooner, and all this will be done while minimizing periods of vulnerability.

You will also find that the strategies and techniques in this book can be applied to rapidly increase your skill level and performance in other areas of your life, including work, education, and other hobbies!

A Plea to Pirates: Please Read

If you are reading this book and have downloaded it for free, I am not here to threaten you into buying a legitimate copy of the product. I would rather focus my time and effort on improving The Osiris Method and my free Starcraft 2 strategy site. Some of you may not have realized that this was released as a for sale book and instead downloaded it off a private forum without realizing it. Some of you may have received a copy from a friend. Some of you know this is a product and went out of your way to download it for free. That's fine too – I am not here to tell you that you are a bad person, though I would ask you not to pass the guide along for free.

Instead, I am going to ask you to read the book and follow the practice methods found within. If you found this book useful and it helped improve your Starcraft 2 ranks, please visit www.osirismethod.com and purchase a legitimate copy.

Please remember that Starcraft 2 is a relatively small niche. While Starcraft 2 sold millions of copies, the number of active participants in any one ladder season is under a million players. Given that only a fraction of these people will ever hear about The Osiris Method, and only a fraction of those will buy the guide, my potential customer pool is very small. Every purchase makes a huge difference for the long-term success and sustainability of the guide.

If you found this book useful, purchasing the guide or referring your friends to the sales page may even be in your best interest. Purchasing the book will give you access to the member's area, where the latest version of the book will be available for download. I plan to put out updates regularly to keep up with balance changes and meta-game shifts, so having the latest version of the guide is important to your success. The Osiris Method is a very large book and took months to put together. Updating the product is very time consuming. The more sales the book makes, the more time I will be able to dedicate to keeping the guide up to date with the latest balance patches and shifts in the meta game. Additionally, with more sales, I will be able to dedicate more time to writing strategy and providing new builds at www.osirissc2guide.com.

Thanks! And double thanks to those who already purchased the book!

Your Brain & Starcraft 2

Before we begin the specifics details of the training program itself, we will first cover some neurology basics. **It is important that you do not skip over the next section.** Understanding the basics behind the way the brain works is more than just a justification for the training program presented in the subsequent sections. In fact, there are 3 primary benefits you will receive from this section:

- By understanding the basic functions of the brain and how they relate to performance, the rationale behind the practice drills become clear, allowing players to pick the drills and areas of performance that are their weakest;
- Understanding why we practice the way we do can create intrinsic motivation, which will increase the amount of time you want to spend practicing;
- Finally and perhaps most importantly, understanding the brain processes involved in learning heighten the effectiveness of programs based on these processes. In simple terms, if you understand the goal of a specific drill, then the benefit you experience from that drill will be immensely magnified. If you are performing a drill with no idea why you are performing it, you do not get much benefit out of it.

I will try to keep the anatomy and physiology of the brain areas we are interested in as relevant to Starcraft 2 as possible. While the section below is grossly simplified, understanding these basic brain areas will allow our entire training program to fall neatly into place.

The Prefrontal Cortex - The Seat of Starcraft 2 Ability

The prefrontal cortex (sometimes called the prefrontal area) is a region of the brain that is responsible for **executive functions**, which is just a fancy way for saying conscious thought. While various parts of the brain help us solve problems, our prefrontal cortex is the seat of our attention - it is what is used when we are thinking actively about a specific problem. This brain area is the most significant difference between the brains of humans and primates.

The prefrontal cortex is used in every area of conscious thought: problem solving, planning for future events, attention, multi-tasking, and inhibition of thoughts. In short, the prefrontal cortex is the part of your brain that you use most intensely when playing Starcraft 2.

Limitations of the Prefrontal Cortex

Now think about Starcraft 2. Players often call it a "game of multi-tasking", and that the best players are simply better able to do many things at once better than other players. When the regular

person witnesses a professional play Starcraft 2, they seem to think that this person is juggling an infinite number of things in their head at the same time.

The problem with this view is that it is wrong! While people can indeed multi-task better with practice, they never actually are able to "multi-task" but rather switch back and forth between the two tasks at a faster rate (Moran, 2009).

True multi-tasking results in incredible performance decrements and is a terribly inefficient use of brain resources. Consider the Prefrontal Cortex itself, marked in blue on the picture of the brain below:



From the model above, you can see that the prefrontal cortex itself takes up very little space on the brain. In fact, this part of the brain occupies less than 5% of the total volume of the brain. While the prefrontal cortex is powerful, it is small. Its primary job seems to be to coordinate the data supplied by other parts of the brain. As the brain thinks itself through a problem, the prefrontal cortex sends out the work to the other parts of the brain, synthesizes it, and comes up with a solution.

The problem is that the prefrontal cortex actually only seems to be handle a few tasks at once, with 1 task resulting in optimal performance.

Research into multi-tasking has revealed the existence of something called **dual task interference**, which is the idea that any task which relies on the same regions of the brain cannot be executed at the same time at optimal performance. Dual task interference has been thoroughly researched by scientist Harold Pashler (Pashler, 1994).

Among the highlights of Pashler and other researchers was the discovery that our ability to multi-task is more limited than most people could have imagined. When asked to solve cognitive puzzles, adults are

much faster than the average 3rd grader. However, when those same adults have to perform a second basic task, such as adding or subtracting whole numbers, the adults fare no better at those cognitive tasks than the children. In short, trying to do even two simple things at once significantly reduces brain power.

Fortunately, with practice, the prefrontal cortex can become much faster at processing information (Moran, 2009). We will cover that more in a later section.

Dual Task Interference and Starcraft 2

Most players try to play their way through Starcraft 2 while trying to multi-task. They consciously and actively switch their attention between in-game tasks, such as controlling units, training reinforcements, building more workers, researching new technology, and scouting. As researchers have demonstrated, this constant change in attention ultimately results in significant performance decrements.

I am sure everyone that has played Starcraft 2 has experienced dual task interference, often many times in a single game. Think about the panic that sets in when you are in the middle of a major battle and the other player slips a drop into one of your expansions. Are you able to react? Even professional level players can take losses in such a situation, either diverting attention away from the main battle and losing the benefit of good micro, or by not paying attention to the drop and letting it do major havoc inside their base before finally cleaning it up. Lesser players frequently just freeze up entirely, often losing their main army or even the game in the process. At a bare minimum, production will be halted entirely in response to such a dual-pronged attack.

Imagine how much easier Starcraft 2 would be if you only ever had to focus on one thing at a time. How much better would your micro and tactics be if you only had to look at your units, and your base automatically built itself, trained reinforcements, expanded, and built new workers? You would likely be unstoppable, as controlling your units is much easier when you can place your full attention on them!

Strange as that sounds, this is how professional players actually play Starcraft 2. They are able to push off much of the raw mental processes involved with playing into other parts of their brains, so that the prefrontal cortex is free to put its attention to the more fluid aspects of the game, such as micro, reconnaissance, harass, and predicting the enemy's strategy.

In the following sections, you are going to discover how to achieve this shift in brain activity for yourself and how to disrupt it in others. This is what is required to become an elite Starcraft 2 player.

Working Memory and Starcraft 2 - Conquering Your Limitations

Working memory, or short-term memory, is the amount of information or ideas that you can hold at the forefront of your brain for a very limited period of time. Since the prefrontal cortex discussed earlier is at the seat of your attention, you can think of your working memory as the amount of different things your prefrontal cortex can access quickly. While your prefrontal cortex can only truly focus on one item at a time, it can switch between items in the working memory at a very rapid rate, without actually having to stop and "think about it".

To use a computer analogy, working memory is like the RAM of the computer, whereas long-term memory is the hard drive. In this analogy, the eyes of the user are like the prefrontal cortex. A computer can store thousands of programs in its hard drive (long term memory) and is able to open several programs at once (working memory). The eyes of the user (prefrontal cortex) can only look at one program at once, but can quickly tab between programs.

Working memory is extremely limited. In one of the most popular experiments, working memory in the average adult was determined to be 7 items long. This is why phone numbers were originally only 7 digits: it was thought that was what a person could easily remember without a lot of practice.

However, while this is true for numbers, the amount of items you can store in working memory decreases as the items you are focusing on increase in complexity. On the other hand, the amount of items you can store in working memory increases with increasing familiarity.

Chunking - The Key to Superior Mental Performance

Imagine trying to remember this sentence: "Zerg players think SkyToss and the Immortal Sentry All-In is overpowered." If you play Starcraft 2, such a sentence would take no effort at all to memorize, as these concepts are familiar to you already. Give that same sentence to someone who has never played Starcraft 2 before and it would take them a very long time to memorize all the words and their proper spellings.

Why are Starcraft 2 players able to recall such a sentence easier than regular people? Do Starcraft 2 players simply have superior working memory? Of course not. The reason they can remember what the sentence says is due to the neural process known as **chunking**. A chunk refers to a collection of smaller bits of information that are stored in the brain together. In this example, the "chunks" are the words, and the individual letters are the components of that chunk.

When we go back to that sentence a few paragraphs back, when a Starcraft 2 player was presented with the earlier sentence, the word "SkyToss" and "Zerg" are chunks of the letters S, K, Y, T, O, S, S and Z, E, R, and G. The sentence is much easier for a Starcraft 2 player to remember, as they already have a clear idea of what SkyToss is and what Zerg represents. Each word only takes up 1 unit of working memory,

whereas a regular person would need to dedicate an entire unit of memory to each letter in unfamiliar words if they hope to remember the spelling!

More advanced Starcraft 2 players would chunk the sentence even further. "Immortal Sentry All In" is a phrase that any top-level Wings of Liberty player (or dedicated spectator) would recognize. This entire concept is one chunk and one unit of information. If you hung out on forums or fought against this combination before, you might even think that the "Immortal Sentry All-In" was indeed overpowered in Wings of Liberty, and you could chunk "the Immortal Sentry All-In is overpowered" all into one unit of information. Through chunking, the amount of information a person can handle increases significantly.

What does this have to do with competitive gaming and Starcraft 2 in particular? It turns out that chunking is what allows professional players of mind-based games to be elite at those particular games. More specifically, research into grandmaster chess players has revealed that players do not derive their skill from working memory that can be applied to memorizing anything. In fact, their working memories are not superior to that of the average person. Pros are not simply geniuses that have working memory beyond that of the average player. Instead the professionals become more skillful due to pattern recognition and the neural process known as chunking.

There have been a multitude of studies which have demonstrated the improved chunking ability of expert chess players over regular players. Perhaps the most famous experiment was that of Chase and Simon in 1973. In this study, expert chess players and beginners were shown chess boards with the pieces spread on the board for a limited time. They were then asked to recall the places that the pieces were found at on the board.

The results were very interesting: when shown chess boards where the pieces were common arrangements for top-level play, experts were able to remember the entire board piece by piece, whereas beginners were only able to remember a handful of pieces. However, when the chess pieces were not real-game positions but rather randomly placed on the board, experts were no better than beginners at recalling the pieces (Chase & Simon, 1973)! This is hard evidence that top-level chess players do not have better working memories than beginners, but rather that they have condensed the chess positions into single pieces (or chunks) of information. Beginners on the other hand could not remember much at all because each individual chess piece and the position of that piece was a unit of information.

Let's reimagine the experiment in Starcraft 2 terms. Imagine a standard base layout of the popular Protoss opening build, the "Forge Fast Expand", was shown to both professional Protoss players as well as relatively new Starcraft 2 players. Players were allowed to look at the base layout for 10 seconds, and then asked to recreate the build from memory. The professional players would likely be able to nail down the positions of all the buildings down to the exact spot, whereas the non-pros would only be able to remember the placement of a few buildings.

Next in our theoretical experiment, those same pros and newbies alike were shown a Protoss base layout using structures that made absolutely no sense and would never be used in a real game. When

asked to recreate such structure placement and alignment, pros would fare no better than newbies. This is the power of chunking.

Further research shows that the higher the skill level in chess, the more complex the chunks of information become. Grandmaster chess players do not actually consciously calculate their actions fifty individual moves into the future as sensational journalists like to report but instead have developed large chunks, where the position of the pieces on the board may represent a single chunk of information, and the possible enemy moves are boiled down to a few chunks which consist of the known viable strategies at that point of the game.

In essence, grandmaster chess players have created huge numbers of chunks which represent the variety of strategies and moves used in chess. They have played so many games of chess so many times that they have stored these chunks in their long-term memory. When the grandmaster sees a particular layout of pieces on the board, they already know what their viable options are. Often these options are chunked into many moves because their opponent also knows what the viable options are and what the viable counters are. This is all specific to the current way the pieces are laid out on the board. Grandmaster chess players are not actually actively coming up with strategies during the game, but rather pulling from their long term memory. These strategy “chunks” that are relevant to the specific game they are playing are pulled into the working memory. By this process, the prefrontal cortex has narrowed down thousands of possible moves into a handful of chunks that it can easily manipulate to calculate the best move.

Chunking and Starcraft 2 Performance

Just like with chess players, elite Starcraft 2 players are able to synthesize large amounts of in-game information into a single chunk, freeing up valuable brain resources to focus on other more dynamic parts of the brain.

By now, I hope light bulbs are going off in your head. You now know that the primary decision-making part of your brain, the pre-frontal cortex, can only hold a few items in its working memory at a time and it can only truly pay attention to a single one of those items at once. You also know that large amounts of information can be condensed into chunks, and that top-tier chess players can condense an entire board worth of pieces into a few (or less) chunks.

With this information in hand, it should be clear that in order to become expert Starcraft 2 players, we must come up with strategies and tactics to condense the large number of variables in Starcraft 2 games into chunks that are much more manageable to the prefrontal cortex.

In the next section, we will discuss how chunks are created by the brain. By understanding how to create chunks, we can begin deconstructing large and complicated Starcraft 2 concepts into simple chunks that can be more easily handled by the prefrontal cortex.

Patterns and Chunking - How to Create Chunks

Now that you know that creating chunks is the key to performing at the highest level, the next logical step is to learn how to create chunks. This process is actually automatic: chunks will naturally begin to form with several rounds of exposure to a particular pattern. All you have to do is repeat whatever it is you are learning over and over again. However, there are a few caveats: the simpler the task, the faster you will learn it; the more attention you pay to what you are doing, the faster you will learn it; and the more consistent each repetition is, the easier it is to learn.

Simplifying the Chunk

In the next section, we are going to chunk sections of Starcraft 2 into practicable sections. These sections need to be simple. This does not necessarily mean not complicated but rather means that we should practice small parts at a time.

For example, imagine you want to master a new build order that is very economically aggressive and relies on harassment techniques to keep an enemy pinned down while you aggressively expand. Rather than try to practice the entire thing together, you could break the build down into the macro part and the micro part separately. First, practice the build against a computer, just focusing on the macro (building things, training harvesters, etc.), training the units required but not actually attacking. Once

that is perfected, you could practice the harassment without actually worrying about keeping up with the macro. Once both of these aspects are perfected, they could be combined much more easily.

Do not worry about exactly how to go about memorizing a build just now – we will go into that in the practice section.

Paying Attention

During practice sessions, the more attention you can pay, the faster you will learn. You do not want to be talking to your friends, listening to music, or anything else that may be distracting, unless you want to increase the amount of time you need to practice.

Formation of long-term memories is highly dependent upon attention. The practice sessions I have designed require focus and are designed to automatically command attention. When we get to the practice sections, you will see that there is no way you will be able to listen to music or talk to people and follow through with the drills recommended, so I do not think this needs any more elaboration.

Consistency of Repetition

The final aspect of fast chunking is to make sure that the repetitions you are performing are consistent. If you are practicing a specific build over and over again (more details in the practice section), you should be doing so on the same map over and over again. You should be using the game clock so that you can make sure you are finishing up around the same time so that there is no noticeable difference between practice repetitions.

Why Chunk & Perform Patterns?

The whole purpose of creating chunks is that they are stored in our long-term memory and can be executed by other parts of the brain aside from the prefrontal cortex. In particular, the medial temporal lobe and the basal ganglia both play huge roles in this process. The location and names of these brain areas are not that important, but the net effect of this is very important: chunking and repetition allow us to perform tasks and actions with minimal attention from the prefrontal cortex.

Think about it this way - do you need to consciously think about the process of washing your hands? Of course not, you decide to do it and it practically happens automatically. You can continue to think about whatever you were thinking about and your hands will get washed just fine. This is hopefully something you have done thousands of times before, so the replication of this effort does not take up mental resources.

Our goal is to make chunks just like hand-washing in Starcraft 2 - actions you can perform automatically without thinking about it, so your prefrontal cortex is free focus more intensely on variables beyond your control.

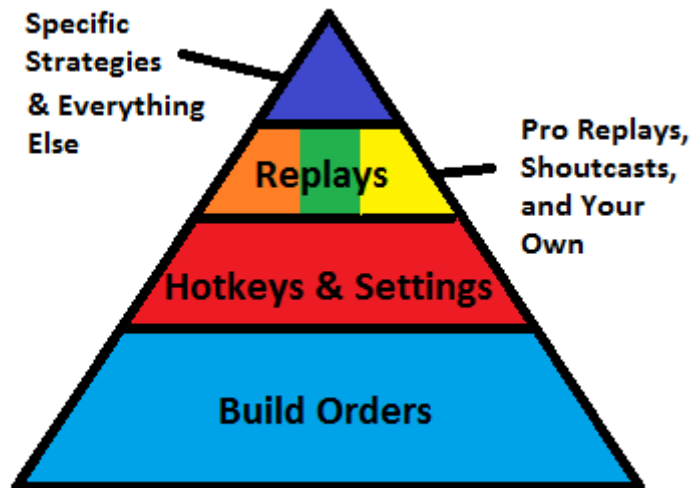
The Real Difference Between Pros and Amateurs

The key takeaway here is to understand the primary difference between the professional and amateur. When the professional is macroing in the beginning of a game, he already knows what his next unit or structure is going to be ahead of time. A beginner is looking at the resources and supply count and actually calculating what to do next. A beginner thinks to himself, “oh, I have banked up some extra resources; I should expand or build more production facilities”. A pro already knows when, what, and how many production facilities and expansions they are going to take. There are no brain resources wasted on calculating when and where to build things – a top-tier player has already determined these and practiced these things many times before the match has even started.

Imagine if you already knew what your move would be next without ever needing to check your supply or resource count – it was so well rehearsed that the only reminder you needed was the game clock. Think of how much faster your moves would be and how much easier it would be to micro your units and pay attention to things like the mini-map and scouting. This is the cornerstone of what the “Osiris Method” is all about.

The Real Starcraft 2 Pyramid

Now that you understand the brain basics needed to master Starcraft 2, we can begin to create our Starcraft 2 training program. The first thing I want to do is go back and talk about the "Starcraft 2 Pyramid", which many people promote as the key areas of learning in Starcraft 2. Most of these graphics are actually a lot more complicated than they need to be. Here is the true pyramid of learning in Starcraft 2:



If I posted this picture in the beginning of this book, you would probably think that this was a joke. Now that you understand chunking, you should be able to recognize the wisdom applied in this graphic. If not, allow me to make myself clear:

Your build order is an extremely large chunk that lets you push the entire macro portion of Starcraft 2 - that is all building and production - to the subconscious portion of your brain. This frees up your prefrontal cortex to control units and respond to your enemy's actions.

To elaborate, learning a few good build orders gets you halfway there to being a great Starcraft 2 player. Doing this while also learning all the hotkeys and efficiency tricks for your race and change your settings as recommended in a later section will get you ¾ of the way to greatness. After that, watching 3 types of replays while following the practice exercises recommended later in the book will get you 90% of the

way there (by the way, the 90th percentile in Starcraft 2 puts you in the middle of the Diamond league). In reality, all the match-up specific strategies like transitions, building placements, and various strategies that players make a big deal out of really do not affect the outcome of lower-level matches (I am considering anything not in high-diamond league to be low-level). Most players unfortunately spend their “practice time” alternatively mindlessly chaining ladder games interspersed with reading about the specifics and strategies associated with whatever match-up that they keep losing to. The problem with this spending a lot of time focusing on strategy is that unless you are already ranked very highly in Starcraft 2, these specifics are worthless. You can improve your win rate much faster by just becoming a faster, more efficient player without actually increasing your Starcraft 2 knowledge.

To clarify this idea, let’s use the Terran vs Terran match-up as an example. A pro player will be able to produce 4 Hellbats and 2 Medivacs by the 6:40 mark, dropping these on the opponent within the next 30 seconds or so. This is a viable strategy no matter what your opponent builds. A low ranked player may try to copy the exact strategy, but does not get their Hellbats and Medivacs out until 7:40. This is no longer a viable strategy when the drop is delayed this much.

Why Build Order at the Pyramid Base? Why Automate Macro?

Automating your macro is quite simply the most important difference between professionals and average players. By automating macro, I mean that you should practice your build order so many times in low-stress situations that replicating it becomes automatic. Every action you take in the game, from the second you train a new worker or the position you place a building should be the exact same from game to game. The more automated your macro is, the better of a player you will become. Unit counters, army compositions, spell casters, drops, everything - it is all secondary to your build order by a huge magnitude.

Build order works because it is something that is planned ahead of time and it is something that does not change. You can practice it over and over again with the game clock running to make sure you are repeating truly the same actions over and over again. Build orders in particular must be mentally automated because they are the only aspect of Starcraft 2 which is truly consistent. Imagine you are a Protoss player playing against a Terran player, and your plan is to go for a 6-Gateway all-in attack. Each time you perform this build, you are making Probes, buildings, and offensive units at the same time each game. This is something that becomes more and more natural with practice.

Simultaneously however, a good Protoss player would want to harass the Terran player with the first few Stalkers that come out. After all, Terran players cannot easily stop a well-microed Stalker in the early game without a Bunker or Marauder. Forcing the Terran player to get a Bunker will slow down whatever build they are working on, making them more susceptible to your all-in attack.

However, the Stalker harass cannot be automated, because each Terran player you perform this on may respond differently. Some might go for Marauders, some might throw up a Bunker, and so on. In some

games, the Terran might mess up and let you kill a few Marines. In some games, you might mess up and lose your Stalker! These are the sorts of things you cannot practice specifically, as the millions of possible combinations you may run into may be forever novel. Since each game is slightly different, your prefrontal cortex needs to focus on these sorts of problems. You cannot play at your true potential if you are constantly diverting brain resources away to think about what to build next.

Many pro players will use “cheesy” builds in order to disrupt an efficient build order of an opponent. For example, it is very common for Terran players in TvZ games to go for a 2-Barracks early attack. This is not designed to win the game but rather to just throw the Zerg player off and force the Zerg player to abandon their well-rehearsed build order, which at the pro level are typically based on getting out as many Drones and expansions as possible in the early game.

While the way you control your units changes constantly, your build order will likely be consistent from game to game. Barring some sort of cheese, you will likely get all your main buildings up and units out at a specific time and supply count. This makes the build order very practicable. Specific practice drills are discussed in later sections.

Effects of Automating Build Order

Have you ever seen a professional Starcraft 2 game where one of the pros is able to cause a significant amount of distraction with a single worker? This is very common when you have a Probe that blocks the Zerg expansion or attacks the SCV building a Barracks. Have you ever tried to replicate that in-game? The effects are very interesting. Typically, the lower the rank of the player, the more disruptive your Probe harass becomes. At the same time however, lower ranked players are unable to take advantage of this, as their own macro slips since they are paying too much attention to their Probe. The Protoss player harassing the Probe can delay an expansion an ungodly amount of time, but at the same time, that same Protoss player is letting their own macro slip and delaying their own structures, sometimes even causing more harm than good!

Professional players are able to dedicate so much brain power to controlling their scouting worker because they have already performed the same opener they are executing in the current game hundreds if not thousands of times prior. By practicing the same build over and over again, the process of training workers, expanding, and grabbing tech becomes automatic. This frees up the prefrontal cortex to perform seemingly impossibly complex micro tricks. The pro already knows the brief windows of time he can freely micro without slipping behind on macro.

Fortunately, we do not need to practice the build thousands of times to get a major competitive advantage. Given that most players actually *never* practice builds (at least the way I am going to recommend in the training sections), simply executing a build 10 times will give you a huge advantage over your competition.

Effect of Interrupting Build Orders

While considering all the advantages that using a pre-determined build order provides for the player, you should also know that these advantages can be taken away from your opponent by interrupting their build order. Many effective build orders involve harassing the enemy, since this harass can interrupt the enemy's build order. Even if you do not come out ahead on the "Units Lost" tab from a harass attack, often the attack ended up being to your advantage.

Imagine a drop where you lose 4 Hellbats and 2 Medivacs (800 resources worth) and kill off 10 workers (500 resources worth). Lost mining time for the enemy aside, it may seem like this was not a very advantageous drop. However, nothing could be further from the truth, because it suddenly throws a kink into your enemy's build order. Everything is delayed while they come up with the 500 resources needed to replace those lost workers. The prefrontal cortex must be activated (drawing its attention away from whatever it would normally be focused on in the game) and used to fix this sudden loss of workers.

The reason this does not affect the dropping player is because this player was counting on this drop as part of their build order. Units lost are not nearly as consequential if losing those units was actually part of the player's original plan. No one plans to lose their own workers to drops, so these sorts of disruptions to the enemy's plans are highly effective. While they might not change the actual balance of the game, they force the enemy to use their prefrontal cortex to adjust their build order in accordance with the loss, throwing the enemy off their game. They may make mistakes, control their units less effectively, and otherwise become a less effective player for the remainder of the game.

As an example, if you have watched professional-level games, no doubt you have seen players get surprised by a drop or two and never recover in their game. A single drop or two can sufficiently throw a player's game off to the point where they get pushed around the entire game. They lose control of the match and never regain it until the former player builds a large enough advantage to win the game. Their prefrontal cortex is doing too much work as it tries to fix a busted build order, and it can no longer keep up as more drops and harassing attacks keep coming. These players then make what seems like basic mistakes, engaging in bad spots, not responding to further drops, forgetting about their units, losing reinforcements - the list goes on.

Now that you know the importance of build orders, let's talk about effective ways to find top build orders and then we can finally reveal how to practice these builds.

Build Orders in Starcraft 2: What They Are, Where to Get Them, and How to Practice Them

The term "build order" is frequently thrown around in Starcraft 2 circles and is commonly defined as the order in which you build buildings and train units. While this is true, the mistake is that most players are not nearly as specific as they need to be when discussing or performing builds.

Players tend to think of build orders as sort of something that degenerates after the first 20-30 supply, which is a huge mistake. A player may discuss something like a "Forge Fast Expand" build on the forums, but what exactly does that entail? Does the Forge or Nexus come down first? Is a wall created with buildings, and if so, which buildings? When do you put the Photon Cannon up? Do you get one or do you need more? When is gas added? What do you transition to? What units and tech comes next? When do you take your third base? Additionally, at what time on the game clock do all these events occur? The average player performing a "Forge Fast Expand" build is not likely to be able to answer these questions, at least not specifically.

Professional players do not leave such things to chance. They know exactly how they are going to play the first 10+ minutes of a game, and there is little the opponent can do to change that. Depending on the build, the Nexus might come down at different times, but each time that same build is executed, that Nexus is going to come down at the exact same time on the game clock.

The reason this is so important is because by practicing build orders repeatedly, professional players no longer have to dedicate much brain resources to the macro portion of their game. The reason they control their scouts and initial few units so well without letting their macro slip is because their macro is practically automatic.

Where to Get Build Orders

In this book, I have provided nine highly effective build orders - one for each race match-up (one for the Zerg in ZvZ, one for the Terran in TvT, one for the Protoss in PvP, one for each the Terran and Zerg in TvZ, one for each the Terran and Protoss in TvP, and one for each the Zerg and Protoss in PvZ). You can find these listed in the "Sample Build Orders" section of the book.

At the time of this writing, you can easily just master the 3 build orders associated with your race in this book, perform them over and over again, and ultimately end up in the Diamond League (or beyond) without actually learning anything else! However, new patches will certainly come out over time, and each new expansion is going to introduce new units. Old units will get nerfed and buffed, so the best builds will of course change over time.

Getting New Build Orders

Fortunately, getting build orders is very easy - you simply “steal” them from professionals! Replays from professional players are readily available on many different sites around the internet. These are free and released by pros and tournament sponsors for your viewing pleasure. Not all pros may not be crazy about the idea of players getting their hands on their replays and copying their builds, but tournament sponsors often stipulate that these replays must be released, as it increases the viewership of the tournament by fans who were unable to watch it live or want to re-watch a specific match-up.

Some good sources for replays are:

<http://www.gamereplays.org/starcraft2/replays.php?game=33&show=events>

<http://gosugamers.net/starcraft2/replays/>

<http://www.sc2replays.eu/>

<http://www.sc2-replays.net/en/replays>

I personally prefer the gamereplays.org link, but included others in case gamereplays.org ever goes down. Be careful not to download amateur games when it comes to copying build orders. You only want to pro builds. I do not even like to pull builds from Master’s players. Instead, I prefer to click use the “Events” tab to download replays from particular professional-level tournaments. That way, you know you are only getting builds from the absolute top tier of Starcraft 2 players.

To get builds, simply pick a match-up, download the replay file, and watch it in-game. Note that you have to move the replay file into your Starcraft 2 folder (Starcraft II --> Accounts --> Acct # --> Replays --> Pick any replay folder. When you open up the replay option in-game, check the folder you moved your replay files to in the earlier step). Watch a handful of professional-level replays, and pick a game where the player whose build you want to copy does not get attacked in the first 10 minutes. It is okay if this player attacks the enemy, because you can replicate this yourself.

When you get the replay you want, you need to watch it slowly and write down absolutely everything based on time. Each time a unit is trained, note the time, the unit or structure trained, the supply count, and any other notes you may want to add. You want to do this up until the first major attack. This can be anywhere from 4 minutes as high as 12 minutes depending on the build. I will admit that this is definitely tedious work, and each replay takes about 20 minutes to an hour to copy.

Fortunately for you, at the end of this book I have already included 1 great build for each race match-up. You should not need to create your own builds unless you have already made it to the top tiers of gameplay or should a patch or expansion render old builds obsolete. If you ever need or want to copy pro builds, I have also provided a blank chart at the end of this book (plus the same chart in several file formats in the member’s area section of the Osiris Method’s website) that you can use to help speed up the process. I have found the fastest way to copy builds is to print out this chart and then write in the build by hand as you watch it on the computer screen. You can then type it up from your handwritten

note and print it out (or just use the handwritten chart). This is much faster and easier than trying to copy the build directly to the computer by tabbing between Starcraft 2 and a text editor.

Not only do you want to include units and buildings, but you also want to mention each time the pro-level player attacks. Spare no detail - you after the first two minutes of a game, you should have at least 1 action occurring every 5-10 seconds.

Whether you hand write or type up and then print out the build, you ultimately will want the build on a sheet of paper. This is needed for our actual practice section (coming up next).

Your build should include everything up to and including the first major offensive move. This depends on the nature of the attack and build. If the build involves using drop play or other harassment techniques to contain the enemy while you grab additional expansions, the build should account for all of these actions - it should not stop just after the first drop. On the other hand, if the build is an all-in timing attack, the build should include the attack, but can end after the attack is done.

How Many Build Orders Do You Need?

For some reason I frequently hear players mention that in order to progress through the ranks, you need to master a large variety of builds and strategies. With what you have learned from the previous sections, truly mastering a build is a huge advantage in Starcraft 2, but it also takes time. If you only have a limited time to play, spreading out your practice over a variety of builds may actually result in you not ever getting good at any one build, hindering your performance.

Really, you only need to master 1 build order for each race combo in order to advance very high in the ranks. There is the belief that somehow players are inferior for not learning many build orders, but the fact is that most players who try a variety of builds never practice each individual build long enough to get good at using it!

Let's put it in perspective, consider the following question scenario. Who do you think will be higher ranked:

- A Protoss player that can execute a flawless 4-gate with pro-level timings;
- A Protoss player who can perform a variety of builds such as a 4-gate, the forge fast expand, and a proxy Oracle, but finishes all of these builds 15-45 seconds slower than a professional.

It is no contest - the person who gets out their units faster is going to win a lot more games. While on paper, a traditional Wings of Liberty 4-Gate should lose to a 2-Gate/Robo/Mothership Core-style build. However, if the player using the 4-Gate is 30 seconds faster, it does not matter what the opponent does. The 4-Gate will arrive before the Mothership Core has enough energy for Photon Overcharge, and the 4-Gate units will be able to destroy any Pylons before an Immortal gets out. Speed is everything in the first 12:00 of Starcraft 2.

Using more unit types does not necessarily win you more games. Getting out units faster than your opponent and then controlling those units well always wins games. In the early days of Wings of Liberty, the professional player White-Ra was infamous for the speed and efficiency of his 4-Gate, something that won him a lot of games, even when the enemy knew it was coming. Enemy players would scout his 4-Gate, know it was coming, attempt to defend against it, and still lose to it! He could have started every game with a warning: “I am going to 4-Gate you :)”, and still have wound up in the top ranks of Starcraft 2.

This is why "random" players never win major tournaments. Being a random player requires you to learn too many builds. General skill in Starcraft 2 is not enough to be successful. Mastering the wide variety of builds required to be a random player is too difficult and time consuming to ever be viable. It really comes down to practice time: people who play one race only have 3 match-ups, whereas players who play random have 9 possible match-ups. If these players practice the same amount of time each day, the players who stick to a specific race will have 3x the amount of practice as a the random player with each race.

Why Professionals Use Multiple Build Orders

After reading the previous sections, you might wonder why professionals go to such lengths to master multiple build orders if they would be more effective by just practicing the same build orders over and over again. If professionals master a lot of builds, why should regular players not aspire to master just as many builds?

The primary reason pros need to learn many build orders is because **professionals play in tournaments**. Tournaments rarely involve just one game but rather involve winning best out of 3, 5, 7, or even 9 games! If you play the same opponent 9 times in a row and use the same build every time, each game that goes by, your opponent will become more familiar with your strategy. They will need to use their prefrontal cortex less and less to counter your strategy and can instead devote more and more mental resources to controlling their own units and mitigating your attacks.

Fortunately for regular players on the ladder, you do not have to play against the same person 5-9 times in a row. Even if you perform the same build every game, it is not a big deal, because you rarely see the same player twice in the same day. Professional players on the other hand do not often have that luxury: at the very top ranks, there is a smaller player pool, so players end up playing against the same opponents much more frequently.

A Quick Aside on Map Variations

There is also another reason pros learn multiple builds: map variations. Take for example the Terran vs Zerg match-up. Pro Terran players typically like to grab their natural expansion very early. They have to

balance their need to expand with the threat of an enemy Zergling attack. On large maps with multiple spawning locations and a long distance between bases, Zerglings are far less threatening as it will take them longer to cross the map and they will actually have to find the Terran player before they can attack.

As a result, on a big map, Terran players can safely be more aggressive with when and where they place their expansion. On the smallest, two player maps, the Terran player will likely want to get a Barracks first and build their expansion safely behind a Barracks/Supply Depot wall, then lift it off and move it into position once they have enough units to secure the expansion. On medium to large maps, a Terran player may decide to opt for a “Command Center first” build, where they get their second Command Center before they actually build a Barracks, using the Command Center to form part of the wall, moving it into position once the structure is complete. On the largest maps, a Terran might not only get a Command Center first, but they might construct it right out in the open at the natural expansion, knowing that they will be able to secure it before the Zerg player actually gets Zerglings across the map.

The builds I recommend in this book are generally on the more conservative (safe) end so that you can use them on any map. Your win-rate will still be high by playing conservative on a big map that does not require it, as long as you can execute a pro-level build at the appropriate speed. Remember that unless you are already in the master’s league, even a conservative pro build is likely going to be faster than your opponent, even if the opponent is being greedy. Their skill level is lower than a pro, so their timings will be slower.

Once you reach the master’s league, you can start to add on different builds for different maps, making alterations based on the size and layout of the map on which you are playing. Before ranking that highly, you need to focus on mastering 1 build for each race match-up. That will be your highest payoff exercise rather than working on multiple builds and drilling down to the specifics of map-by-map strategies.

Creating Your Own Build Orders from Hand

If you are thinking about creating a completely new build using strategies not yet seen before, do not waste your time unless you are at least in the Master's league. True creativity and innovation only exists at the expert level. If you have already mastered a variety of builds and are very high ranked in Starcraft 2, you might then consider a new build. Even at the Master's level, I would not recommend making your own builds, but rather tweaking pro builds you may like to specific maps or alternative plans of action (such as a timing attack slightly earlier or later), but not actually altering the main build itself.

Please understand that it is not that I do not trust you or do not think that the average player lacks the ability to be creative but rather this is how experts and the greatest performers of all time have always developed their skill and creativity in other fields. Mozart’s first learned to play other’s music before doing his own composing. His first “composed” music was just arrangements from other famous musicians – no original work. Modern research has revealed that this “child prodigy” did not actually

produce any great works until he turned 21 – he spent the prior 18 years practicing other’s music and arranging the work of his predecessors. This is how you must be with Starcraft 2 if you want to advance up the ranks quickly. You must copy other build orders (i.e. playing pre-written music), you may then tweak these build orders to fit a particular situation (i.e. arranging compositions), and only then once you have achieved total mastery of the previous steps will you actually be able to create your own build order (i.e. write your own music).

Let’s say however you are truly some sort of creative genius or have otherwise lucked into a ridiculously effective strategy and wanted to create a build order around it. The problem with creating your own build orders as well is that you need to be able to practice them without giving them away. If you actually created your own build order that was highly effective and unlike anything any player has seen before, it would not be long before an enemy you played against saved your replay and floated it out onto the internet for many people to steal. Soon, everyone would be using your build, and it would no longer give you an advantage. You can practice builds some in private, but eventually you would need to use them in a real game. Eventually, other players of your race would steal that build, and once that build was adopted by a large number of players, players would learn to counter it after running into it consistently.

The top-tier professional teams get around this with the use of practice partners and gaming houses. If you are a pro Starcraft 2 player, you can practice your build in-house against your teammates without worrying about it leaking out onto the internet. You could then unveil it at a tournament, where it might take other professionals by surprise. The Korean teams are famous for this, and for good reason, as Korean tournaments are the most competitive and have very large prize pools.

In short, stick to the build orders in this book at first. Once you have mastered those build orders (or if these build orders are outdated due to patches) and want to learn new ones, you can do so by downloading professional level replays and copying these builds. If you want to create your own strategies that fit your own playstyle, wait until you are in the 5% of players.

Now that you have access to some top build orders, we are going to discuss exactly how to go about mastering these build orders.

Practicing, Zones of Learning, and the Split Attention Problem

Practicing build orders move for move is not very entertaining, so we want to make this process as quick and efficient as possible. The first thing you should know is that it is commonly accepted in pedagogy (teaching) and research circles that there are three “learning zones”. Different researchers and educators use different terms, but the general idea is that activities take place in the “comfort zone” – i.e. no challenge at all, the “panic zone” – i.e. overwhelming challenge, or in the “growth” or “learning zone”, which is somewhere between comfort and panic. People learn the fastest when they are in this “growth” zone. This is a task that is challenging but not completely overwhelming.

Unfortunately, most people practice Starcraft 2 in the “panic zone”. There are many things going on at once and a lower-ranked player ends up going through an entire Starcraft 2 match feeling constantly overwhelmed. This is why mastering build orders needs to be a top priority in Starcraft 2 - when you do not have to think about your build order in a specific game, you can pay more attention to micro, increasing the rate at which your micro improves.

It gets worse though. As mentioned in the first sections of the book, learning and the creation of long term memories is highly dependent upon fully focusing your attention on a single item. Imagine a Starcraft 2 game. If your attention is perpetually split between controlling your units and building your base, you are never focusing on any one thing in an optimal way, which reduces learning. Most players spend each game of Starcraft 2 completely overwhelmed, in a frenzy as they look all over their map and all over their base, never truly in control of a match, even ones that they are winning. They are constantly looking at their units, then going back and trying to spend their minerals. During battles, minerals build up, supply counts drop, and the game degenerates into a frenzy on both sides.

As a result, build orders need to be practiced alone in a non-competitive game before being used in actual ladder match. The removal of the worry about winning or losing from playing in an unranked or computer-match reduces the stress associated with Starcraft 2, allowing players to drop from the panic zone to the learning zone. Additionally, the constant split of attention between macro and micro in a competitive match will significantly slow down learning. In a private match versus the computer, you can sit separate macro from micro and practiced each one individually.

Even players in lower leagues get decent at replicating the same build for the first few minutes of the game with enough practice. However, once offensive units start coming out, the builds seem to vary greatly from game to game. This is because once they start needing to micro, the learning stops, as attention is split amongst many tasks and the level of mental engagement goes from the “growth” level to the “panic” level.

How to Practice Build Orders

Practicing build orders is something that needs to be done in a custom game versus the computer, at least initially. Additionally, you must have the printed out build order in front of you. I do not recommend tabbing between Starcraft 2 and the build order, as you want to be practicing like you play competitively (i.e. full screen). Also, make sure you have the game clock turned on. You can find this in the menu under Options --> Gameplay --> Show Game Timer. This will display a small clock above the mini-map so you can see exactly how much time has elapsed.

The actual practice itself is very simple:

- Before you get started, make sure you have your build order right in front of you. You should note not only the order of the unit and building production, but the time on the game clock each time an action is taken. Additionally, note down the units used to scout and make offensive attacks, as well as the times that these occur.
- There is 1 build order for each race match-up that you can print out at the end of this guide.
- Create a custom game versus AI in Starcraft 2. Select the AI to be "very easy" and "economic focus". This will ensure the AI does not really do much except sit in its base and harvest minerals.
- Pick a 1v1 ladder map. These are maps you would see if you played a 1v1 ranked match. If you are unsure about what maps are in the ladder pool, the following URL contains a good, up to date list:

http://wiki.teamliquid.net/starcraft2/Maps/Ladder_Maps

- Practice works best on the same map that the professional was playing on when you created the build order. You can practice the same build order on multiple maps, but it may need to be tweaked depending on the map. For example, if the expansion is a few seconds further away, that may delay the entire build by a second or two. Alternatively, structure placement and the number of structures may need to be altered depending upon the map. If you are using the build orders at the end of this book, just keep that in mind that you may be a second behind or ahead of the build, depending on the map you are using for practice.
- Start replicating the build in-game with precision detail. As soon as the match starts, look at your sheet. Follow along, matching unit for unit, time for time. Matching time is extremely important. If the build you are following recommends a Pylon at 9/10 supply, this does not mean at 9/10 supply, 10 seconds later than recommended in the build. The times must be matched perfectly.
- Once you get to about the 1:30 mark, you will no longer have time to stop and look at the paper. As a result, I recommend pausing the game. Opening up the menu (F10) will pause a game in a single player game, so remember that hot key.

- What you will do at this point is literally follow each instruction, one at a time, pausing the game after you execute each command. If a Probe is trained at 2:55, train the Probe at that time, then pause the game to see what comes next on your list.
- Pretend the enemy computer player does not exist. If you train units, simply keep them idle. Do not worry about controlling units until you have completely mastered the build order.
- If the build you are using contains offensive aspects, create the units, but do not control them just yet.
- Do not worry about scouting or harassment at this point.

At this point, you should simply repeat the build in a step-by-step fashion like this, pausing the game every time you need to be refreshed of what comes next. The more you repeat this, the less and less you will need to look at your sheet. You might start out by memorizing the next few units or buildings constructed at a time, pausing less frequently as you create larger chunks of memory.

Once you complete the build from start to finish, simply restart your game and do it again. Keep doing this until you can perform the entire build from memory. Note that this is all done in single player. Not having to divide attention between the build and an enemy player will allow you to learn much faster as discussed in previous sections.

Practicing After the Build is Learned

Once you can perform the entire build from memory, you can start to work in new elements. Your build should also note exactly when scouting is performed and when attacks are made.

Start by practicing the performance of the mastered build in conjunction with scouting. You should be comfortable tabbing back and forth between your base and a scouting worker before you ever try a build in an actual competitive game. Again, by breaking down the learning process into simple steps, learning becomes many times faster.

Whatever build you are emulating ultimately have some sort of attack. This is often referred to as a "timing attack", but the truth is you will need to attack your opponent at some point, so all builds are really timing attacks. Only once you can perform a build from memory with proper scouting and "jousting" with initial units should you actually add on the attacking phase. The attacking phase itself should also include notes on reinforcing your attack with additional units. This macro portion needs to be practiced so that your prefrontal cortex can focus on controlling units. Note that transitioning out of failed attacks/builds is a subject for discussion in a later section. Regardless, perfecting timing attacks even without a good transition is enough to push your ranks into the Diamond league.

Practicing In Game

Once you can comfortably repeat a build order from memory while controlling workers and initial units, you are ready to actually practice your build in a game. At first, I recommend doing this in un-ranked games, as this way you will not feel pressure if you lose while you work out the kinks in your build order.

After you master your first build, you can practice it in-game versus every race. Even if you only know one build, you will want to use it in every single match-up, no matter what the race is or the map you are on. Repetition of the same exact thing is what is required for fast learning, so we do not want to jump around from build to build. Many newbies like try to master a variety of builds all at once, which simply results in slow learning. As the saying goes, the jack of all trades is the master of none!

In practice games, make sure you follow through with the build order and actually attack your enemy. This is where most of the learning happens in practice games, as you should have already previously mastered the build order in single-player games. Practicing your build order before you actually get in a competitive game means you will have far more attention to pay to your micro when you attack your enemy. You will be surprised at how quickly your micro gets better when you are not dedicating a large amount of your attention to your macro. You will be dropping Force Fields, Psionic Storms, EMPs, or Fungal Growths like a pro in no time once iron out your build order.

Taking a Practice Run

Each time before you play an extended session of Starcraft 2, you will want to take a non-competitive run-through with the build you are practicing. This means simply repeating the build in single player, even if you have already mastered the build previously. The reason for this is that it is much easier to recall a build in-game without much mental effort if it has been recently repeated. If you never go back and practice the build you have mastered, it will begin to take up more and more of your attention in competitive games.

Specific Practice Sessions

Now that you know the general process we are going to take, we will go over the process that you can use to make mastering a build a reality:

- Once you have your build written down on a sheet of paper, you can get in-game and load up a match versus the computer as described in the previous section.
- Begin practicing replicating the build as described previously in a step-by-step manner.
- Repeat this 10 times, pausing after each step. This will take about 1.5-3 hours of practice time for a build taking 8-10 minutes. If you only want to practice an hour or 2 a day, this step may take a few days.

- For builds that go beyond 10 minutes (such as Stephano's infamous 200-supply Roach attack), you will likely need to repeat this 15 times before you can proceed to the next step.
- Once you have run through the build 10-15 times, pausing after each step, cut down your pausing to the next 2-3 moves. For example, if you pause the game at 3:00, and the next 3 moves are building a Probe at 3:02, building a Gateway at 3:08, and building another Probe at 3:20, you would try to remember all 3 of those moves before pausing again.
- Repeat this 10 times, pausing every 2-3 actions on your sheet. Since less pausing is required here, this should only take about 1-2 hours of practice time.
- Once you get to this point, you want to try to replicate the build on the sheet with only pausing every 30 seconds. After 30 seconds of play, pause, and double-check your work with what you have written down on your build order sheet.
- Repeat this 5 times, pausing every 30 seconds. This is about 1-1.5 hour of practice time.
- Perform the same drill, repeating the build you want, but this time pausing only once per minute. Make sure you have not fallen behind the timings written down on your build sheet.
- Repeat this 5 times, pausing every minute. This is about 1-1.5 hour of practice time.
- Perform the same drill, this time only pausing every 2 minutes. Repeat this 5 times. This is again about an hour of practice time.
- Next, try to perform the entire build straight through. After all the repetition you have performed previously, this should not be difficult. However, remember that you do not want this to be difficult, you want it to be automatic.
- Repeat this 5 times. This is about another hour of practice time.
- Finally, begin to integrate scouting into your build. You may need to pause occasionally at first, but if you practiced this same build already 35+ times as recommended, you should find that you have plenty of mental capacity available to control your scouting worker. This is why drilling build orders is so effective in the first place!
- Repeat this 5-10 times. This is another 1-2 hours of practice. Practice it until it is smooth.
- At this point, you should be ready to use your build order in-game against other players!

Before even entering a game, I recommend running through a build 40 times (or more, if you are having trouble learning it). This is approximately 10 hours-worth of single-player practice. If you play an hour of Starcraft 2 a day, this means that mastering the macro portion of a single build is going to take you a full 10 days to learn! When you consider that most players try to tackle a variety of builds at once, and then learn those builds slower since they are practicing in competitive games, it is not surprising that most players never actually get any better at Starcraft 2. They are simply trying to take on too much. One build per race match-up is plenty for most, as this is still a month worth of practice to get really good!

Once this practice is completed, simply play the game out in competitive games, using the build you just practiced in each game. Once you master several builds, you will be able to pick and choose between the few in your arsenal, depending upon the map and race match-up.

Where Players Go Wrong

Based on the example in the previous section, you can see that real practice in Starcraft 2 is highly regimented. Most players at best watch a professional level game, typically on a streaming channel on Twitch.tv or a shoutcastingYouTube channel, see a pro player perform a build that looks cool, and then go right into a game to try and replicate it. This never works, for a variety of reasons:

- Watching a replay 1-time is not enough to duplicate a build. Watching a replay 5 times even is not enough, as there are too many variables to remember when you include game time in your build order. You must write this down.
- Professional-level builds are typically geared towards getting out maximal offensive output at a specific time. For example, a Protoss player might plan for major Gateway aggression at the 8:00 mark. If you "kinda-sorta" replicate the build based on memory without ever plotting out the exact time, odds are your attack will come in too late or with not enough units.
- The exact same build needs to be repeated many times in order for the process to feel automatic and free up the prefrontal cortex for more dynamic decision making.

As an example, I saw a professional match-up of a ProtossvsTerran where the Protoss player was able to put a lot of pressure on a fast-expanding Terran player by opting also opting for a fast expansion and then transitioning into 6-Gate pressure.

As a test, I went into a single game and attempted to replicate what I just saw.I ended up on 2 bases, with 6 Gateways at around 120 supplies with 2/2 upgrades at the 11:30 mark on the game clock. This of course was assuming no interaction with the enemy the entire time.

When I went back and watched the professional replay, I saw that the Protoss' timing attack actually occurred at the 8:15 mark, 70 supplies, and no upgrades. The similarities between our builds were not even close! I had mistakenly thought that the Protoss player got out upgrades, but the Forges were not built and the upgrades were not researched until after the initial timing attack. I confused this in my head, which is very easy. This is why you need to write down the build order.

Not only was my build order in improper order, it was in all aspects inferior to the professional's build. While the Protoss player's army was very small and had no upgrades, the Terran had virtually nothing other than a Bunker full of Marines. If I was in the Protoss player's position, if I did not attack until the 11:30 mark, it would have been far too late to do any serious damage with my Gateway army, as Medivacs or Mech would have been on the field at that point, both of which are too beefy to deal with without the use of T3 units.

The professional Protoss player's build was way less susceptible to early attacks as well when compared to my attempted reproduction. There were far more units produced earlier in the game, and Sentries had accumulated large quantities of energy by the time the Protoss player went on the offensive. The pro's build was all around much more survivable than my guess while simultaneously getting out an offensive force sooner.

Now you know why so many players struggle with proper build order. They read it on a forum or see it in passing in a replay or stream and then attempt to replicate it as best they can on their own. This bastardized build order recreation is not nearly as effective as a planned, pro-level build. It is also much harder to learn this way, as guessing what the build is leads to less exact repetition, and less repetition means less learning.

Practicing Your Mastered Build

Once you get into live, competitive games, you will begin to learn how your build works against a variety of unit combinations, as well as how to optimally control whatever units are part of your timing attack against a variety of enemy unit combinations. Learning that results in improvement in effective unit control in this manner is much faster than if you just experimented with a wide-variety of builds. While this may be counterintuitive, remember that the repetition and simplicity of such practice makes learning and skill improvements come at a much faster rate.

As an example of how this learning process in action, no doubt you have seen what frequently happens when professional players encounter a build for the first time that they have not seen before. Namely, their quality of play becomes significantly reduced. The pro encountering a highly novel build will make dumb decisions, will neglect basics like training new workers, will lose units due to messed up rally points, and otherwise suffer from a series of mistakes that ultimately culminate in a loss.

You want to try to use your same build versus all sorts of enemy openers. You will find that the more you can practice a single build, the more readily you can counter what the enemy is doing, no matter how different the enemy's actions are from game to game. You cannot control exactly what your enemy will do, but you can make your games as smooth as possible by repeating things on your end.

Do I Really Need to Do This? (Plus the Importance of Timing)

Yes, you really need to do this. Copying what the best people in a given field are doing **is the cornerstone of human skill**. Coaches and teachers in every other profession already know and practice this fact.

The general impression of the Starcraft 2 community is that in order to get better at Starcraft 2, you just need to play more games, discuss unit counters, then come up with the best strategies on a case-by-case basis. While it sounds intuitively correct, it is actually quite a poor way of doing things.

Compare that to any other skill, such as music or chess. A chess newbie who copied move-for-move a grandmaster's strategy against another chess newbie is going to win every game no matter what the non-copier uses as a strategy. A new musician who learns an easier piece of classical music is going to sound much better when performing than a new musician who was taught the basics and told to make

up something to play. The former musician will sound great whereas the latter musician will sound awful!

People learn by copying off of the best that came before them. There is no need to reinvent the wheel. When you learn all you have to learn from those who are already the best, then and only then will you create something entirely new.

Some of the more enlightened members of the community recommend copying build orders, but not enough attention is paid to the timing of those build orders. This would be akin to giving a musician a list of all the names notes in a Mozart work, then being asked to play the music with no idea how long to hold each note. A pro-level build order with no timings attached versus one with times attached to each move is the difference between a list of meterless notes versus sheet music.

What Happens Next

Once you have mastered your builds of choice and use them in-game, you will find that you are not always successful with your initial timing attack or aggression, so the game must continue before you can end it. Sometimes, your attack may fail miserably, causing you to get behind in a game, whereas other times, it is quite successful, but you still do not have a large enough advantage over your opponent to win the game.

At this point, the game transitions to the mid or late game (depending upon the time of your attack). Mastering this portion of the game requires a lot less specific practice and a lot more general knowledge. The reason for this is that each time you enter the late game, the scenario is likely very different, as no two opponents are going to have exactly the same units in exactly the same positions at exactly the same time - every situation you encounter will be unique in its own way. This is especially true when you are using the same build against different races. These transitions are discussed in the race-specific strategies section towards the end of the book.

Time to Get Down to Specifics

We have finally established the background information necessary to get into the specifics of our Starcraft 2 training program. The actual order of information will be presented in the following fashion:

- Efficiency
- Build Orders
- Replays
- Race-Specific Match-Ups
- Step-by-Step Practice Plan
- Appendix (includes printable charts/drill sheets)

Strategies in Efficiency

Before you can begin to copy pro-level build orders successfully, you first need to be able to interact with Starcraft 2's interface at a high level. You are not going to be able to replicate the timing and speed of professional-level builds if you do not know the tricks and tips to speeding up in-game actions.

The Truth About APM

A common excuse for why players seem to think they are low ranked is not that they are “bad” at Starcraft 2 but rather “can’t move their fingers” as fast as the pros. To put it simply, this belief is ridiculous. The pros are able to move their fingers faster than you because they know what they are doing next, not because they are “twitchier” than you. If you are slow when controlling your units, it is because you do not know what to do, not due to an insurmountable lack of ability.

Imagine person “A” is new to a computer and person “B” has been using one for a long time. Person “A” will see person “B” type very quickly, and think that they will never be able to do that because person “A” was not born with the ability to move their fingers as fast as person “B”. Of course, that sounds ridiculous – person “A” is unable to type as fast not due to a biological constraint but rather because they do not know what the home keys are or have the positions memorized. This is no different in Starcraft 2 – everyone is capable of high APMs, it just requires practice.

The key to becoming faster is knowing where your fingers need to go next before it is actually time to move them into position. For example, the fastest typists for example are able to project their sentences far into the future, thinking about what they are going to type several words ahead of what they are currently typing at any given time. Professional Starcraft 2 players are the same way; they are thinking several moves ahead at any time thanks to chunking. You will develop this ability as well naturally as you practice build orders in the way recommended throughout this book.

You might be thinking you do not have the capacity to move your fingers or click as fast as the pros, but that is not true (nor do you need to have an APM that high to have a lot of success in Starcraft 2). As mentioned throughout this book, if you want to learn something in Starcraft 2, you need to isolate that action. Most people cannot just play games of Starcraft 2 over and over again and miraculously get better at all aspects of the game. Instead, if you want to learn quickly, you need to isolate the specific tactics in efficiency.

There are 4 types of strategies that we will cover: general strategies for that all players must take advantage of, and then race-specific tactics that you must learn to use as well.

General Strategies in Efficiency - Game Settings

Players can become noticeably better at Starcraft just by tweaking a variety of settings that are not on or are not adjusted properly by default in Starcraft 2. Here are the top setting changes you must make before even getting started in Starcraft 2:

Gameplay Settings - These Options Found Under the "Gameplay" Tab

Show Game Timer

In the options section under "gameplay", be sure to check off "Show Game Timer". When practicing build orders, we will rely on this clock heavily to execute the most efficient and tight build orders. Additionally, as you play games competitively, you will begin to recognize the timings of enemy builds. That is, if you are playing an enemy race and you recognize the opener, among equally skilled players, the timing attacks that come out of those builds generally hit around the same time. For instance, if you were going against a 4-Gate, you would expect it to hit around 5:45 in the top leagues, 6:00 in Platinum, and sometime slightly later than that in lower leagues. More details discussed on this later.

Show Alerts

This displays a note each time an event happens in game - when buildings complete, units are trained, and when you get attacked. If you find this distracting, you can turn it off. Newer players may find the extra visual stress of these alerts to be detrimental to their performance.

Display Build Grid

This is an option you definitely want turned on. This shows a square "grid" on the ground when you go to construct or land a building. This will ensure when constructing a wall off that you do not accidentally leave holes in the wall. Have you ever been in a game and looked at your buildings and wondered if the construction was Zergling-proof? Or perhaps even lost a game when you thought a wall-off was tight, but really Zerglings could sneak by?

The building grid eliminates this problem - there is no need to guess when figuring out where your buildings should go. Note that large units need a full empty building square to pass, whereas small units can pass through structures that are cattycorner to one another. To clarify, imagine if you build two Barracks such that the corners of the Barracks touched one another, but they actually did not take up any of the same coordinates on the X or Y axis. The corner where they meet looks sort of like a wall, but

it is not a complete wall. Small units like Marines, Zerglings, and Zealots could sneak by. However, your Siege Tanks and Thors would not be able to squeeze through such a tight space.

More details on walls are discussed in each race's individual section later in the guide.

Display World Object Tooltips & Display Game Tooltips

Optional settings - really makes no difference. Personal preference.

Display Hotkeys on Command Card

This is a setting you want to turn on, as it shows the letter hotkey over each unit command. As discussed below, memorizing every single hotkey is necessary to be good at Starcraft 2. It is hardly distraction so I do not see why you would turn this off.

Enable Starting Worker Rally

This should be checked off. Newly added in Heart of the Swarm, this makes your starting workers automatically go to the mineral line. Do not think you can uncheck this and somehow split your units faster to save a fraction of a second. Even if you could, it would never make up for the times when Starcraft 2 hiccups a bit at the start and you end up a few seconds behind. This starting lag actually happens more than you might think, and keeping this on will save you a lot of resources.

Show Unit Life Bars

Here, I recommend setting this to "damaged". It makes it easier to spot which units of yours are taking damage and is a reminder about what needs to be repaired, transfused, healed, or microed away. Damaged seems superior to the "Always" setting, because you get a faster indication of which units are being focused. With the "Damaged" setting, you can tell when a unit is at 90% HP, but with the "Always" setting, it is very hard to tell when a slightly damaged unit is amongst healthy units.

Display Team Colored Life Bar

Turn this off. You want to see the same colors every game. If your own health bars and your enemy's health bars are different colors every game, the chunks that form in association with those colors become less meaningful. When you see a red health bar over your enemy's units, you know that that is a

unit to focus down. When you see a red health bar over your own units, you know that is a unit you need to grab and pull back. Colors need to mean the same thing each game.

Always Show Worker Status

This is an amazing feature as it shows you the exact amount of harvesters at each vespene gas and at each town hall. Make sure it is turned on. Previously, experts had an advantage over beginners, as experts could accurately guess the amount of workers mining or at a vespene geyser with a quick glance (experts create chunks), whereas beginners would need to select the workers and count. Now, no matter what your skill level, you will quickly be able to restore the appropriate number of harvesters to your vespene geysers and mineral patches when you transfer workers to a new expansion or when you get attacked and lose workers in the process.

Enable Simple Command Card

This does not actually do anything different, just changes the way the commands are displayed for your units. You should be using hotkeys to control your units anyway, so perhaps keeping this enabled is best to prevent you from clicking unit commands.

Show Current Order Indicator

This is a useful visual tool for reminding yourself of where you have sent your units. Keep this enabled, as memorizing the information yourself takes up brain space. It is better to let the computer handle as much of the information as it can.

Select All Larvae

When manually clicking on a Larva, if this option is enabled, all of your larva will be selected. Turning this option off can actually be imperceptibly more efficient. It allows you to select individual larva so you can pick where your next drone comes from. In the very early stages of the game, you can pick the larva closest to the mineral field you want to send the Drone to once it has finished, slightly decreasing the distance needed to be traveled by the newly hatched Drone.

This option does not make much difference for Zerg players, as no good Zerg manually clicks their larva past the 2 minute mark. You should be using hotkeys to pull up your Hatcheries and Larva anyway (discussed in the Zerg section).

Display Experience Points

In the grand scheme of things, this does not really make much of a difference. The extra information from showing the XP gained might be distracting, but at the same time, it gives you a clear idea of whether you actually killed a unit or not.

For example, if you were fighting a group of Dark Templar and they were fleeing your detectors, you might not have a clear indication of which ones you killed and which ones got away safely. Seeing the experience points pop up is a guaranteed indication of a unit kill. This is particularly useful if you have the graphics settings set on low, when dealing with cloaked or burrowing units, and when the enemy scoops up units in Medivacs or Warp Prisms. Imagine the enemy dropping 2 Medivacs full of units, and you kill some of the dropped units, but you are not sure how much. There is some blood on the ground, but you cannot get an exact count. With the Experience Point counter feature, you can quickly identify how many units you killed, so you know whether or not it is worth pursuing the Medivacs and how weak (or strong) your opponent's forces are depending on how much they lost. For this reason, I leave this turned on.

Enable Enemy Unit Selection

The fact that in the Heart of the Swarm beta that this was disabled by default is frustrating. This is a setting you must leave selected. You need to be able to select enemy units, because selecting enemy units gives you a huge amount of information. In particular, you need to know the level of upgrades your opponent has. Additionally, selecting enemy units will reveal whether or not the opponent has researched unit upgrades that affect movement speed (revealed by mousing over armor), health (i.e. Combat Shields for Marines), or attack speed (revealed by mousing over attack speed).

Control Groups

I prefer this set to unclickable. You should not be clicking your control groups, and turning this off prevents you from accidentally clicking your control groups with a misclick. However, it is nice to see the display of how many units are in each control group. This gives you a quick way to evaluate the strength and composition of your army.

Flyer Helper

This displays small circles on the ground underneath flying units, with a thin dotted line connecting the flying unit to the ground over which it is flying. Since the game occurs in 3-dimensional space but the observer only has 2-dimensional controls, the spot on the ground where flying units may be affected by

attacks is not the same as where the unit appears on the screen. As an example, Medivacs that are sitting directly over Marines that they just dropped actually appear slightly above the Marines on the screen. This is a graphics effect.

This is relevant because if a Zerg player wanted to Fungal Growth this drop, if they used Fungal Growth and clicked on where the Medivacs appeared to be, the Fungal Growth would miss. Instead, they need to use the Fungal Growth on the area where the Medivacs actually are placed, which is represented by the Flyer Helper.

You need the Flyer Helper enabled so you can line up your casted abilities perfectly and so that you can dodge casted abilities to the best of your ability.

Settings in the "Controls" Tab

The changes you make in the controls tab are going to have a bigger impact on your skill levels than any other tab. By choosing the right settings in the controls tab, you can significantly improve your "skill cap" by allowing you to reach higher and higher levels of efficiency and performance. This is done by changing the speed at which you move the mouse and the screen as well as how you move the screen. By increasing the speed and accuracy with which you can control the camera, you save a lot of time that you can dedicate towards other aspects of macro and micro.

Mouse Sensitivity

Under the "Controls" section, you are likely going to want to turn up your mouse sensitivity. This refers to how much the mouse moves in-game when you move your mouse on your actual mousepad. I cannot tell you the optimal percentage to set this to, as this depends on the mouse sensitivity of your computer in the first place.

For example, if you have your mouse sensitivity in your computer's system settings set to high, setting the mouse sensitivity in-game to high might be just a little too fast. On the other hand, if your computer's system settings are fairly low, you will want to put the Mouse Sensitivity bar near the max in Starcraft 2.

The goals should be to be able to move the mouse from one side of the screen to the other in one single movement of the wrist. Lesser players have the mouse speed set slow enough that as they are moving the mouse from one side of the screen to the other, the mouse reaches the end of the mouse pad, forcing the person to pick up the mouse, move it back, then continue their slide once the mouse is back on the pad. While this sort of movement is fine for surfing the internet, it will be constantly wasting half a second here and there, time you really do not have to spare when trying to perform at the top level.

If you still cannot move the mouse across the screen without needing to lift it off the mousepad or bumping into your keyboard, speakers, monitor, or computer tower, you need to turn up your mouse sensitivity. For windows machines, simply open the start menu, type in "Mouse", and select the "Mouse" file that pops up in the automated search.

Mouse Scroll Speed

Another option you will want to change is the "mouse scroll speed". This refers to how fast the screen moves when the mouse is at the edge of the screen. I recommend setting this to the maximum. Before you think that this is too fast, allow me to explain. Most beginner players rely on this as their primary means of movement. This is a major problem. The default scroll speed is way too slow, and if you are scrolling across the map, it can take a few seconds - a few seconds you do not have, particularly if your opponent is not relying on this slow method of shifting the screen.

Instead, you should be able to use the mouse scroll at a high setting as a way of shifting the screen quickly across the map. This is great when you need to get to corners or edges of the map - such as when fighting off enemy drops into your base or when harassing an enemy's mineral line. We will discuss finer methods of unit control below.

Drag Scroll Speed

When you want to move the screen small amounts at a time, this is because you are microing units. If you are microing units, you need your mouse in the center of the screen in order to issue movement commands to the units you are microing. If you use the mouse scroll to move the screen, moving the mouse away means less time spent controlling your units. Most players when kiting literally constantly move the mouse back and forth between where they want their units to go and the edge of the screen in order to cause the screen to move to keep up with their units' new positions. This is a sure-fire way to have inferior unit control.

On the other hand, if you try to use arrows to move the screen, you will have to take your left hand off of the hotkeys used to control units. You need always have your hands on these keys when controlling your units so you can issue attack-moves, hold positions, and cast spells.

The only solution (other than setting up custom hotkeys) is the drag scroll. This involves pressing the middle mouse buttons (or another mouse button if you like - but make sure it is on the mouse). You can change keybindings in the "Hotkeys" section of the menu under Global -->Camera --> Drag Scroll.

If you have ever tried to use Drag Scroll in-game, you likely have not used it since, as it is incredibly slow. However, when you set the speed from the default 20% to a blistering 100%, it becomes extremely useful and is perfect for simultaneously controlling the movement of your units as well as the camera

while only using your mouse hand. This lets you keep your left hand on the keyboard (or right-hand if you are using a left-handed mouse) so you can control your units properly.

Confine Mouse Cursor

You want this set to automatic. If you are playing in Fullscreen or Windowed (Fullscreen) modes, this will confine the mouse to the screen, which as stated, makes it easier to move the camera in Starcraft 2. You do not want to set it to always on, because sometimes you may want to practice a bit in regular Windowed mode. This is useful when watching replays and taking notes or copying build orders.

Disable Alt-Tab Shortcut

This is a matter of personal preference. If you use the "tab" hotkey a lot (which you likely will if you are following this guide), you might accidentally alt-tab if your hand is hitting the alt key while you press tab. This can easily cost you the game in Starcraft 2.

On the other hand, being able to alt-tab out of a game is very convenient. If you never alt-tab on accident, do not worry about turning this on, but if you do, you will want to select this option, at least when you are in ranked games.

Disable Windows Key

Now this is an option you definitely want to have checked. It is much easier to accidentally hit the Windows key (pulls up the start menu, minimizing Starcraft 2 if you are playing Fullscreen). If you are playing Fullscreen mode with a different resolution than your default desktop (very common), this can easily cost you 10-20 seconds of downtime while your computer adjusts from the in-game resolution to your regular resolution and then back from your regular resolution to your in-game resolution.

Invert Drag Scroll

Now this is a very interesting option. It may feel more natural with this selected as noted by the in-game tool-tip, but you definitely do **not** want to enable this option. Drag scroll moves the camera in the direction you move the mouse when you hold down the middle mouse button (if you do not have a middle mouse button, go to the store right now and buy one - they only cost \$10).

Drag scroll is extremely useful when fleeing, kiting, or chasing down enemy units. It allows you to use just the mouse to move the screen and control your unit's movements simultaneously with absolutely

no downtime. As you move your units from place to place, you can hold the middle mouse button down and shift the camera towards wherever your units are running. It definitely takes some time to get used to, but this allows you to keep one hand on the action keys (spell casts, attack move, stop, hold position, and so on) at all times, while still controlling your units and moving the camera.

With Invert Drag Scroll activated, the camera moves in the opposite direction of where you are moving your units. This is very slow and cumbersome. Even if it feels more natural at first, you will ultimately be much more efficient at playing Starcraft 2 by leaving Invert Drag Scroll disabled.

Enable Smart Camera Pan

This is definitely something you want to leave unchecked. It causes the camera to pan over to a unit when you select its portrait. While this may look cool, it is a waste of time. We are playing a game where every second counts, so when you select a unit, you want it to be at the center of your screen immediately. I believe this setting is actually not intended for use in ranked 1v1 games, but rather as another tool for the Map Editor for custom games developers as well as for single player and campaign missions.

Graphics Settings

The following settings can be found under the "Graphics" tab in Starcraft 2.

Display Mode

In the graphics sub-section, really the only thing you need to worry about is the display mode. In particular, it needs to be set to "Fullscreen" or "Windowed (Fullscreen)". This prevents the mouse from ever escaping the game window, which can result in a lot of lost time. It also allows you to use the mouse scroll option easily.

The rest of the Graphics settings are simply personal preference and depend upon the power of your machine. You will want to turn your settings down if you lag at all, particularly during battles.

You must play Starcraft 2 in full-screen mode. If you want the option to play in windowed mode, make sure you do the "fullscreen windowed" setting. Attempting to play Starcraft 2 in an un-maximized window is ridiculous, as doing so means that if you scroll your mouse too far and pass the edge of the window, your game will be locked into scrolling. This is horribly inefficient and you do not want to have to move the mouse perfectly to scroll. You want to be able to simply jerk the mouse in the direction you want to move and be instantly moving.

Sound Settings

One of the biggest mistakes Starcraft 2 players of all skill-levels make when playing is not using proper sound settings. Sounds provide two primary advantages in Starcraft 2:

- Sounds provide clues to what is happening in the game that you may not be able to see. For example, no matter what you are looking at in Starcraft 2, there is a very specific noise that occurs when a Nydus Worm is being built. The same goes for when a nuclear missile is launched. If you are not listening to the sound effects, you miss out on these warnings entirely.
- Sounds provide an alternative brain system for providing feedback. Your visual centers may be busy processing one part of the screen, and the sound may provide you with extra clues that you may not actually spot with your eyes. An example of this is burrowed Infestors lobbing Infested Terrans under your air units. You can hear the sound of the eggs spawning long before you actually see your units getting attacked. You also may react faster when sound and visual feedback is linked. An example of this would be reacting faster to moving your units out of Psionic Storm when you both see and hear the ability rather than just see it being casted.

However, certain sounds can be a hindrance in Starcraft 2. In particular, sounds which have nothing to do with the actual game that is being played are a distraction. This includes in-game music as well as other types of music or other noises you may be hearing in real life. While it may be fun to listen to the in-game music or listening to your own songs, adding in irrelevant auditory feedback makes it harder to discern the important sounds like Nydus Worms being constructed. Perhaps more importantly is that music of any variety is likely to command a small amount of your attention, and as a result, slow down learning. Remember that your fullest attention needs to be applied to your current task in order to maximize the rate of learning from the experience. The recommended sound settings below will reflect this reality.

By the way, if you live in a noisy area or are unable to play with the sound effects set loudly(because you live in a dorm or share the house with other people), get yourself a pair of headphones. A very high quality, comfortable set of noise-cancelling headphones with a comfortable ear pad is less than \$60. Sets typically come with a mic as an added bonus, allowing you to take advantage of the in-game VOIP in multiplayer matches. See the "Gaming Hardware" guide in the appendix for more details.

I know this will be very unpopular as many players love to listen to music as background noise when they play. Every research study on this topic has indicated that music of any type hinders learning. People who think that listening to music helps them study are only fooling themselves. Even some pro players with popular streams may listen to music while playing. This does not necessarily mean that this is not hindering the pro's progress. Let's put it this way: winning pros in major tournaments are not listening to music when they are in the tournament booth. If that is ideal for optimal performance, why practice any other way?

Master Volume

You will want to make sure your master volume is maximized. Setting up the master volume makes sure that the Starcraft 2 sounds are by far the loudest thing on the system, minimizing the effects of system sounds.

Music

You will want to check off the "Music Enabled" box. The sounds are distracting as mentioned a few paragraphs up. If you insist on playing with in-game music, you should at least turn the volume down to 20-30%. This way, at least the Sound Effects (the useful part) will play loud enough that the music does not drown them out.

Ambient Sounds

Ambient sounds need to be disabled. These are basically the environmental sounds that you might expect from whatever map you are playing on, such as the sound of wind blowing or water trickling. These block out the regular in-game sound effects that we can use to great advantage, so I recommend turning this off.

I understand that some players get great enjoyment from listening to ambient sounds in-game. If you refuse to play the game without ambient sound, at least turn down the volume to 20%. This will help regular game sound effects stand out.

Sound Effects

The "Sound Effects" category is where all the "good stuff" is - the sound buildings make when they are done building, units when they are done training, various attacks, and so on. Make sure this is set to 100%. You want this coming in loud and clear.

Over time, your brain will begin to make subconscious associations with sound and the appropriate response. While you may not get much out of sound effects, over weeks or months of playing, you will be able to gather huge amounts of information from sounds and be able to respond in kind. Hearing things like a Snipe round going over may clue you in that there are cloaked ghosts.

Interface Sounds

This plays a small sound each time you perform an action in game that involves issuing a command, like training a new unit or putting a unit on hold position. I find this sound effect useful as it helps confirm that the game has registered whatever command you have issued. However, you do only want to set this volume to 30%, as you do not want the simple noise this section makes to drown out important sound effects.

Enable Error Sounds

This makes an obvious sound effect when you issue a command that cannot be executed. This is particularly useful when you are trying to move or build a building somewhere, issue the command, and then go on to other tasks. If for some reason the building cannot be constructed, you will get the error sound. Like the Interface Sound section, I find this useful, but you want to set the volume to 30% so that it does not overshadow important sound effects.

The rest of the sound settings are personal preference and of no consequence to Starcraft 2 players in terms of their effect on performance.

Voice Chat Settings

If you are playing in multiplayer (2v2 or larger matches), you will definitely want to use voice if you are playing with an arranged partner. The settings for this are simple:

Sound Volume While Chatting

Make sure this is set to no less than 50%. This option will automatically tone down the sound effects when voice is coming through. You want to keep the sound effects volume at a minimum of 50%, as sound effects are very important as we have previously established. Additionally, many players breathe into their mics, which would constantly trigger a reduction in sound effect volume, which is very annoying.

Music Volume While Chatting

You definitely want to turn this to 0%. Even if you like listening to music, it is too demanding of a task to task your brain to discern between what the person you are talking to is saying and what sound effects occurring in-game from the music.

Mini-Map Colors

By default, the mini-map typically shows your enemy's units by the spawning color. This may be relevant in 2v2+ matches, but for 1v1, the color of your enemy is irrelevant. What is relevant however is that if your enemy spawns as a color that is similar to the terrain that you are playing on, single units moving on the mini-map may be hard to spot. The similar colors act like camouflage, making it harder to spot enemy attacks.

In particular, this is very relevant when it comes to drops. A single Medivac loaded with units is very hard to spot on the minimap as it is represented by just a tiny pixel. Even if you have scouts around the map (i.e. Overlords or Pylons), the Medivac may pass through their range of vision for only a brief second, showing up on the mini-map only temporarily. If the enemy unit's colors and the background color of the map blend while your attention is busy focusing on other aspects of the game, you can easily miss this drop entirely.

The solution is to set the mini-map to show all enemy forces as red. This can be done by clicking on the bottom button on the right side of the mini-map. Not only does red contrast better with the maps, but this bright red is also not commonly used in Starcraft 2, making it easier to recognize. Additionally, remember that for most of this book we have focused on the merits of repetition and consistency. You will get much better at recognizing drops and sneak attacks on the mini-map if they always are the same color, as opposed to needing to learn to recognize whatever color your enemy's units are. You do not want to have to change your brain processes every time your enemy changes spawning color (practically every game).

Hotkeys in Starcraft 2

In Starcraft 2, you need to be able to interact with the interface and give commands as fast as possible. Most players are already familiar with a variety of **hotkeys**, or keyboard shortcuts used to issue commands instead of clicking.

While changing the camera and controls section will give you an advantage over your opponents, mastering hotkeys is something that has to be done just to remain competitive. There are players in the Bronze league that have mastered at least the basic hotkeys, so failure to use hotkeys yourself will result in serious decrements in performance.

There are 4 primary speed advantages to using hotkeys:

- Using hotkeys for building structures allows you to keep your mouse where you want to build the structure instead of having to move the mouse to click on the unit card, clicking on the structure, and then moving the mouse to where you want to build the structure. Using hotkeys literally shaves off 1-2 seconds for each building you build. Over the course of an entire game, not using hotkeys can add up to several minutes of wasted mouse movement time.
- Using hotkeys to train units is essential for re-macroing during the heat of battle. You cannot control your units in battle with the mouse while re-macroing without the use of hotkeys. You cannot continue harvester production during battle without using hotkeys. You need to know what the hotkey is for training every single unit in your arsenal.
- Hotkeys are essential for spell casters. You do not need to be a professional to learn excellent micro and have great control over your spellcasters. However, you do need to know the hotkeys that are used to control each ability if you want to cast quickly. You aim your abilities with the mouse, so you cannot use the mouse to select the abilities if you want to be even remotely effective.
- Global hotkeys can be used to help control the camera and your units better. We will discuss these more below.

As you can see, mastering all the hotkeys can significantly improve your performance in Starcraft 2. A lot of players think they use hotkeys, but they really only use them for the most common buildings, units, and abilities. If you only know keys for a few important buildings and units, then you are far off your potential skill level in Starcraft 2. Every new hotkey you learn and master will increase the speed at which you can execute your builds and increase the finesse with which you can control your units.

Even if other aspects of your Starcraft 2 knowledge do not change, learning more hotkeys will improve your rank. Every extra second you spend clicking the mouse is a second advantage that your opponent is getting over you. If you are a Protoss player and do not know that “E” is the hotkey for Air Weapons, a Terran player that does not know “R” is used for the Ghost’s Snipe ability, or a Zerg player that does not know “E” is the hotkey for the Ventral Sacs upgrade, then you have not even begun to master your hotkeys yet.

Memorizing Hotkeys

Now that you know just how important hotkeys are (if you did not know already), it is time to go about memorizing them. Memorizing anything is a function of repetition and knowledge. Memorizing all the race-specific hotkeys (units, buildings, abilities, and upgrades) can be done very quickly and efficiently via three methods:

First, when in any game or when performing any of the training exercises in this guide, do not allow yourself to click anything on the unit card. If you do not know the hotkey, mouse over the command you were going to click, read the full name and hotkey, and then press the hotkey on the keyboard. Although hotkeys are shown on the unit card without mousing over the command, you want to be sure to read the actual name of the ability, as this makes the memorization and association between the two stronger. It will be a little slow at first and may cost you some games, but I am going to go out on a limb here and suggest that if you do not already know all the hotkeys, you are not ranked very highly and can afford to lose a few games.

Secondly, there are charts at the end of the book which list out all the units, structures, abilities, and upgrades and their associated hotkeys. This is something you can print out and glance over for a few minutes at a time. Frequency here is the most important rather than total time commitment. It is better to look at it for 3 minutes at a time several times a day until you memorize all the hotkeys rather than try to stare at the paper for an hour straight in an effort to cram the information into your brain. This is also helpful to glance over right before you play or practice in order to refresh your memory.

Finally, once you feel very comfortable with the hotkeys, there is a second set of charts in the training section which just have units and buildings with no associated hotkeys. The drill would be to simply read the unit name and then mentally review the hotkeys associated with that unit including upgrades, production, and abilities. More details are covered in the practice section.

As an example, for the “Marine”, you would say to yourself, the Marine is trained at the Barracks with the hotkey “A”. It has the Stimpack upgrade with hotkey “T” and the Combat Shield upgrade with hotkey “C”. It has the Stimpack ability with hotkey “T”.

Again, more specific details on these training exercises can be found in the training section. Hotkeys can be mastered in under a week with very little effort if you follow the specific plan outlined in the training section of this book.

Important Hotkeys and How They Are Used

Hotkeys are more than just the shortcuts used to build units and structures. They are used to greatly improve the speed and control with which you interact with the interface. In this section, we will discuss not only race-specific hotkeys but also the important global hotkeys as well as strategies for using

hotkeys in coordination with unit and control groups to significantly increase your performance and efficiency.

Unit & Building Control Groups & Their Hotkeys

Before we discuss how to efficiently use hotkeys, we first need to go over the concept of unit and building control groups. A **control group** is a group of units or structures that are temporarily bound to a hotkey in the game you are currently playing. By default, the numbers 0-9 can each be used to make a control group. To make a control group, highlight whatever collection of units or buildings you would like to assign to a group, then press the CTRL key and the number you want to bind them to at the same time.

For example, if you have 10 Marines, you can select them all, and hit CTRL and 1 at the same time. Now, when you press the 1 key, the 10 Marines you bound to this group will be automatically selected. You can change your control groups at any time. You can also add buildings to their own control groups – and you should, as doing so is essential for your success at the highest levels of play.

Strategies for Using Unit & Building Groups

Using unit and building groups serves three primary functions:

- Unit groups increase your ability to micro your units. For example, if you have an army with multiple casters, such as a Mothership Core, Sentries, and High Templar, you might have them bound to the 1, 2, and 3, keys respectively. During a battle, you could push 1 to bring up the Mothership Core and use Time Warp to slow your enemy down. You could then push 2 to bring up the Sentries, allowing you to drop Force Fields to manipulate the enemy's unit position. You could then press 3 to bring up the High Templar, using Psionic Storm on the slowed and trapped enemy units. Using unit groups along with hotkeys for all the casted abilities lets you perform these seemingly complicated maneuvers in a few seconds or less. If you tried to do this all with the mouse, it would be so slow and disjointed that it would not even work. Note that you can shift between unit types within a single control group with the "Tab" key.
- Using unit groups lets you keep up with your macro without actually changing your focus. Imagine you are in the early phases of a game and are training new workers while scouting your enemy. You can bind your Town Hall (Nexus, Command Center, etc) to a hotkey, perhaps "5" and your scouting worker to the "1" key. As you control the scouting worker, you can hit the "5" key to bring up the Town Hall, use hotkeys to queue up more workers, and then press "1" to quickly shift back to your scouting worker. Thanks to control groups and hotkeys, not only does this take less than one second, but you can also perform the entire thing without ever taking your eyes off of your scouting worker.

- Finally, using unit and building groups together lets you reinforce your army during the heat of battle. If you ever watch pro-level games, you should notice that even after trading armies in the middle of the field, the game rarely ends immediately. The reason for this is that both players are constantly rebuilding their armies even in the midst of battle. If you have your production facilities bound to a control group, in the heat of battle you can still press the control group for your buildings, queue up a bunch of new units via hotkeys, and then use your control hotkeys to once again take control of your army. This takes only a fraction of a second and does not require you to shift your focus of attention from the battle. Mastering this alone can be enough to boost your rank by an entire league.

Now that you know the important of unit and building groups as well as strategies for using them, we will begin to discuss specific hotkeys. More tips and strategies for increasing your efficiencies via unit and building groups can be found in these sections.

Global Hotkeys

Global hotkeys are hotkeys which work for all the races. While many players realize that some of these hotkeys exist, very few players actually actively use all of the global hotkeys. Of course, this is to your advantage – learning global hotkeys that your opponents do not know will make you a faster and more efficient player. With that said, here is a list and the function of the most important global hotkeys:

Tab

The tab key allows you to shift between unit or building types in a single control group. Imagine you have 1 drop squad bound to a hotkey – say 8 Marines and 1 Medivac. Naturally, when you highlight a group of mixed units like this, the unit card for only one of the unit types is dominant. Having the Marines as the dominant unit is essential so you can use Stimpack. On the other hand, if you need to high tail it out of there once the enemy comes to defend your attack, you want to be able to quickly access the Medivac to use the Ignite Afterburners ability. You can switch the focus between the Medivac and the Marines by pressing the “tab” key. Pressing tab will change the focused unit in this instance.

This works particularly well for buildings for Protoss and Terran players. You can bind all your production facilities to the same control group. A Protoss player can bind all their Gateways, Stargates, and Robotics Facilities to the same control group, whereas a Terran player can do the same with Barracks, Factories, and Starports. This can also be done with upgrade facilities for all the races, so that any upgrade or research facility is bound to a hotkey. While it admittedly takes a long time to get used to, you can save a huge amount of time by binding your facilities in this manner. How often do you decide in a late game that you need an unusual upgrade or unit combination and then spend 5+ seconds searching out the tech structure and clicking the unit upgrade manually? This is 5-10 seconds you could save every time the game reaches the late game through this strategy.

If you do not use the tab key as it is, you may be wondering exactly what advantage this serves over just binding your units or buildings to many control groups – that is binding your Gateways to “7”, your Stargates to “8”, and so on. The main reason for using the “tab” key is due to the fact that if you wanted to bind everything to its own control group, you would run out of controls! Here is an example:

Imagine you are a Terran in the late game. You might have your main Marine, Marauder, and Medivac ball bound to the “1” key. If you are playing against a Protoss player, you likely have a few Ghosts and Vikings, which would be bound to the “2” and “3” keys respectively. Now imagine on top of that you were performing a double-pronged drop, each one with 1 Medivac and 8 Marines (or 4 Hellbats). Each drop would belong to its own control group, which in this case would be “4” and “5”. Now on top of that, you would have to bind your Orbital Commands, Barracks, Factories, and Starports. This would be “6”, “7”, “8”, and “9”. If you started binding upgrade structures like the Engineering Bay, Armory, and tech labs or added in a few other units like Ravens or Battlecruisers, you would run out of hotkeys.

However, it is more than that – you do not want to put your active unit groups on anything past the 6 key if possible. The reason for this is that you always want to keep your left hand on the home keys (ASDF) of the keyboard, so you can reach any important hotkey at any time. Simultaneously, your right hand should always be on the mouse so you can control the camera or your units at a moment’s notice. If you have to pick up your hand and move it off the home keys to press “7” or “8” to access later unit groups, you will temporarily leave yourself in a situation where you cannot adequately respond to a threat or situation arising in-game. While this vulnerability only exists for a fraction of a second, it does slow down your ability to play the game, so you should avoid it when possible.

Tab fixes this, as you can bind all your production facilities to the same key, and then use the tab button to cycle between them. You can pull up a single control group with all your production facilities, hit “A” to train a bunch of Marines, “tab” to go to the Factories, hit “S” to build Siege Tanks, “tab” to the Starports, and finally “D” to train Medivacs. Once this is smooth, you can give the command to re-macro an entire army in just a second without ever shifting your attention to look at your buildings.

Double Tap

While on the topic of control groups, we should discuss the double tap feature. Whenever you press a control group number twice in a row very quickly, the camera centers on that location. In other words, if you have your Marines bound to the “1” key, pressing the “1” key very quickly two times in a row will center the camera over those Marines.

This is a useful feature to know as it allows you to shift the camera quickly during multi-pronged attacks. For example, imagine you are dropping on the enemy player’s base while jousting with their army in the center as a Terran player. Your main MMM ball might be bound to the “1” key, whereas two groups of 1 Medivac and 8 Marines could be bound to the “3” and “4” keys. Once the drop commences, you could

double-tap “1”, and then run your units away from the opponent’s main army in the center of the map. You could then quickly shift your focus to the first drop by double-tapping “3”. You could then move the Marines into an advantageous position or use them to target down valuable structures like a Spawning Pool rather than have them waste time attacking an Extractor. You could then double-tap “4” to shift the camera to the next drop, repeating the process. You could then double-tap “1” to shift the camera back to your main army, stopping your retreat and attacking their main forces during the confusion. With the double-tap feature, all of this could be done within 2-3 seconds. If you used the mouse or keyboard to shift the screen, you could not even come close to the speed you can change the camera with via double-tapping.

A more advanced strategy using the double-tap feature is to bind each of your Town Halls (i.e. Nexus, Hatcheries, Command Centers) to its own control group – this works best for little-used groups like 7, 8, 9, and 0. Once bound, you can quickly look at any of your bases.

This is very useful if you get dropped on by an enemy while a lot of other events are going on. You can quickly double-tap the Town Hall being attacked so you can run your workers away or send units in to defend against the attack. This will instantly shift your camera and is much faster and more accurate than trying to manually click on each base via the mini-map or moving the camera with your mouse.

Note that the “Backspace” key will move your camera to each of your Town Halls as well, though it is not as accurate. For example, if you see a drop coming for your third base, you might consciously know that you always bind your third Nexus to “9”. You could double-tap “9” to center the camera instantly. With Backspace, you might have to press backspace a couple of times to get the camera to get to that particular Nexus.

Space Bar

Pressing the Space Bar in Starcraft 2 will automatically shift the camera to the latest “event” that is pinged on your mini-map. This would be very useful for things like getting attacked, but Starcraft 2 also considers units or structures finishing production to be events as well. In other words, when a Creep Tumor’s timer finishes, it becomes the latest event, so pressing space bar will then center on that Creep Tumor.

Imagine the enemy drops into one of your expansions, and you get an “under attack” notification. You go to press space bar to center the camera, but in the fraction of a second after getting attacked, a Probe is produced. Pressing Space Bar will center on the Nexus where the Probe came out of rather than on the attack that occurred a fraction of a second earlier.

As a result, while some players may have success with Space Bar, it is better to learn to use other hotkeys and commands to control the camera. You can easily lose a game by pressing Space Bar to

center in on an attack only to have the camera shift to the latest inconsequential event. It is much more efficient to use the double tap strategy mentioned earlier to quickly move the camera to each of your Town Halls.

While it does take extra effort and time to become efficient with the Double Tap method, it is definitely a more accurate than using space bar.

Shift

Shift is one of the most useful global hotkeys in Starcraft 2. It has a variety of functions, but you can primarily think of it as a way to add units or buildings to your current selection as well as a way to queue commands.

Shift for Adding or Removing Units

When holding shift, as you click units, they will be added to whatever you currently have selected. For example, if you have a group of 10 Marines, and 5 new Marines are produced, holding shift and selecting those new units - either by drag or click - will add those 5 Marines to your current selection, resulting in all 15 Marines being highlighted. Note that holding shift and individually clicking a unit that is already part of the group will remove it from the group, whereas holding shift and dragging over units will always add them to the control group.

Shift for Queuing Commands

Holding shift will also allow you to queue up a series of commands given to units. This has a variety of functions. One of the primary functions is when scouting. If you want a worker to scout all over the map because you expect your opponent of creating proxy production facilities (i.e. a Barracks or Stargate right outside your base), rather than moving the worker from spot to spot, you could hold the shift key and select all the areas you want the unit to scout by right clicking. The unit will then move from place to place, going in the order that you clicked.

Shift is particularly useful when queuing up the priority with which you want your units to attack the enemy. Imagine you have a bunch of Vikings and are fighting against Colossi. You will want to focus down each Colossus one at a time via focus firing. You would select all your Vikings, hold shift and then right click on each Colossus individually. This will cause your Vikings to kill each Colossus, one at a time, one after another. This frees you up to control the rest of your units while your Vikings execute their specific commands.

Shift also works great in the case of drops where you do not have time to actually look at the drop in action. You might hold shift to and use your Marines to focus down a few important structures. For example, you could highlight the 8 Marines you just dropped into an enemy Zerg's base, hold shift, then right click the Spawning Pool, Baneling Nest, and Spire, in that order. Your Marines would then kill off the Spawning Pool first, then move to the Baneling Nest, and finally the Spire (if your units are still alive by then!). This makes it much more likely that you get important structures with your drop rather than having your Marines trying to take down a much higher HP target like a Hatchery or a low-cost target like an Extractor.

Shift can also be used with varied commands – it does not just have to be movements or all the same type of commands. For example, if you have a Medivac that you want to drop Marines on an enemy base, you can hold shift and right click to move your Medivac around the edge of the map (to hide it from enemy vision), then press “D” and click on the spot where you want your units to drop, all while holding shift. Your Medivac will then move around the edge of the map and drop its units when it gets to its final destination as you commanded, allowing you to focus your attention elsewhere.

Shift for Constructing Multiple Buildings

You can also use shift to queue the construction of multiple buildings by any of the races. Imagine you want to build a new Nexus with 2-3 Pylons nearby as well as an Assimilator at a new expansion. You could select your Probe, hold shift, select each building and its placement, then the Probe will automatically go to the destination and construct all those buildings.

When you shift build, your resources will temporarily drop as if you had spent the money. A green highlight of the building you are making will appear on the ground to show you what and where you have commanded to be built. Buildings will then be created in that order. If you cancel the command before the queued buildings are built, you will receive a full refund.

As a Protoss player, shift building is great when you want to build multiple structures, as a single Probe can create a large number of buildings at the same time. You can command a single Probe to throw up a multitude of Gateways for example and then shift your attention elsewhere while the Probe moves into position.

Terran players on the other hand have to be much more careful about shift building. The reason for this is that if you highlight a single SCV and have it construct several buildings in a row, the resources used to make those buildings will be pulled out of your remaining balance the second you issue up the command.

For example, if you want to build 5 Missile Turrets around your base to combat Mutalisk harass, you could theoretically pull one SCV, hold shift, and give the command to build the 5 Missile Turrets. The problem with this approach, while tempting, does not actually do anything for you. In fact, it hurts you

slightly. You do not get any mineral advantage to doing this, you spend the resources up front, and you have less uptime for the Missile Turrets. Instead, it is more efficient to pull 5 SCVs off mineral harvesting, build the 5 Missile Turrets with each SCV, and then while holding shift, right click on the mineral patches. This way, you spend the same amount of minerals up front, get no change in mining time, and get your 5 Missile Turrets up faster.

This goes for all sorts of Terran mineral dumps. It is common for Terran players to rack up a lot of minerals late in the game thanks to having multiple Orbital Commands, and MULEs may make it difficult to spend all your minerals. When this happens, a common strategy (even at the pro level) is to build several additional Orbital Commands in the middle of the map. This is done to provide extra energy for scans as well as to create an artificial choke points. Regardless, when you execute such a strategy, you want to build them all at the same time – shift-building is a huge waste of time. It would be better to use multiple workers to get the Orbital Commands up faster so the energy starts building faster.

Obviously, for Zerg players, shift-building does nothing if you have a single Drone selected, as Drones are consumed via building construction. There is still some efficiency to be gained when using multiple Drones, as discussed below.

Shift Building With Multiple Workers

While using shift-building is not very useful when done with a single SCV, it is quite efficient when queuing up multiple workers to build multiple structures. It allows you give several building commands at once without cancelling previous commands.

For example, imagine you wanted to build 5 Spine Crawlers with 5 Drones, you could select the 5 Drones, hold the shift button, press the hotkey for build Spine Crawler, and then place all 5 Crawlers. The Drones will then automatically split up and each one will build one of the Spine Crawlers you selected. The same process works for SCVs. This allows you to give the command to have multiple units build multiple structures with just a second worth of effort.

As a side strategy, Zerg players can do this when maxed out to start the construction of many buildings at the same time. If you group together about 15 Drones in your main base, give the Drones the Command to move to the farthest portion of your creep, then as they are moving, shift-build 15 Spore Crawlers. With the freed up supply, you could then train 15 supplies worth of units, then cancel the Spore Crawlers, giving you 215/200 supplies. Without shift building, the Spore Crawlers would finish before you could rack up a big supply surplus. More information provided in the Zerg strategies section.

Backspace

Pressing the Backspace key will automatically center your camera on the closest Town Hall to where your camera is currently looking. Pressing it again will shift the camera to another one of your Town Halls, cycling through them in order. For example, if you are a Protoss player with 3 Nexuses, pressing the Backspace key will shift the camera to your closest Nexus (likely the third Nexus). Pressing it again will shift it to either the original or natural expansion, pressing Backspace a third time will shift the camera to the final Town Hall. Pressing it a fourth time in a row will shift it back to the beginning of the cycle.

This is a useful key to use, but its main downfall is its position on the keyboard. I do not like to use the “Backspace” key because in order to press it, you have to pull your hand off the home keys to reach it. If you like the functionality of this key, I recommend binding it to something you can more easily reach, such as the Space Bar. As mentioned earlier, the Space Bar’s function is not very useful since it centers on all kinds of extraneous information, so it is okay to bind over its default function.

Alt

Alt is not heavily used by default, but can be used in custom set ups. For example, “Alt + G” can be used to ping the mini-map, useful in team games. I would not concern yourself with the other functions of the Alt key, but you can use it in custom set-ups. For example, if you want to use the Backspace bar’s functionality but do not like how far away the Backspace key is, you could go into custom settings and set the default key for centering the camera on your Town Halls to “Alt+D”.

If you do not feel the need for extra or more convenient hotkeys, do not worry about the Alt key.

CTRL

The CTRL key is used to bind things to temporary groups in the game. Primarily, it is used to create unit groups. Selecting a unit or structure and then hitting “CTRL” + a number key will create a unit group. From then on, pressing the number key (i.e. 0-9) will bring up that particular unit.

CTRL can also be used to create camera position hotkeys, as discussed below.

F5-F8

This advanced hotkey is not well-known but can be highly useful, especially as your level of skill increases. You can use this to create hotkeys for camera positions that you can easily center the map on with the push of a key.

For example, if you have the camera centered on your main Town Hall and press “CTRL + F5”, you will have created camera position hotkey. Now, whenever you press F5 for the rest of the game, the camera will automatically center on that position. There are 4 groups available for this total and they can be bound to the F5, F6, F7, and F8 keys.

This is really useful to apply to areas where you might need to shift the camera quickly, such as each of your expansions. Another good place to center the camera is overtop of any areas where you have a lot of vision, such as a Xel’Naga Tower that you control or overtop of an area where you are placing Observers or buildings to scout for drops.

Unit Commands

There are a variety of unit commands that are automatically bound to hotkeys. Using these commands is essential to proper unit control. Here is the list:

- **Attack Move (“A”):** Pressing “A” then left-clicking on the map will cause your units to move via “attack move”. Attack Move causes your units to move to the target area, but automatically attack any enemy units that they come across in the process. This is typically how you want to move by default unless you are fleeing from an enemy. Not using this command will result in defaulting to regular move, which is a good way for your units to get killed by the enemy without even having a chance to fight back! If the unit has no native offensive attack (i.e. a Medivac), using attack move will just cause the Medivac to move normally.
- **Move (“M”):** If you just right click on the map or mini-map to move your units without using the attack move command, your units will be issued the move command. This moves units from one spot to the next and ignores any enemy units it comes across, even if the moving unit dies without fighting back because of this.
- **Stop (“S”):** Using the “stop” function cancels current commands and actions and instantaneously stops unit movement. However, units issued the stop command only stop for a fraction of a second. If enemy units are nearby your units and you issue a stop command, your units will automatically attack the enemy units if the enemy units are in range. Not only that, but your units will begin moving based on the AI to get in range or stay in range of enemy units.
- **Patrol (“P”):** Patrol causes your units to move back and forth between the selected area on attack move, automatically engaging and attacking any enemy units that they come in contact with. Patrol is particularly good for ranged ground units looking to keep flying drops and scouts from entering the main base. Terran players often use 1-3 Marines to patrol the perimeter of their base to prevent Overlords from sneaking in. Patrol is also good to use early in the game when you want to keep your scouting worker alive in the enemy base without paying too much attention to it. You can hold shift and set your patrol up into a square-like shape, causing your unit to automatically move in a never-ending circle on patrol, foiling Zealots that might try to kill your scout. The trick to performing this is to make sure that the patrol starts and ends on the same spot. This makes sure you have a perfect shape without any weird pauses or errors.
- **Right Click:** Right click is an action command which can have varied effects depending on how it is used. By default, when you have units selected and you right click, the units will move to that location on “Move” (not Attack Move). If you right click on an enemy unit or building, your units will all attack that particular unit or building. If you right click on your own transport with a

group of ground units, your ground units and transport will simultaneously move toward each other and the units will load into the transport when they get close enough.

- **Hold Position (“H”):** The “hold” position action command is commonly used by top-ranked players and not commonly used by those in the lower leagues. Pressing “H” will cause your units to stop moving and lock into their current position until told to do otherwise. While in their locked position, your units will automatically attack enemy units within range. Unlike the “stop” function, your units that are currently in Hold Position will not chase down enemy units, even if they are attacked by an enemy unit with greater range. Hold position is a key tactic in kiting as well as chasing down fleeing enemy units. For example, if you are kiting enemy Zerglings with Hellions, you would move your Hellions away from the Zerglings, press the “H” key so that the Hellions get off 1 attack, then use right click to move your Hellions away again while they get distance and their attack recharges. You could then press the “H” key again once their attack is recharged to fire off another attack. Repeating this process is how players kite enemy units.

There are a few other uses for Hold position, such as creating a unit wall. A single Zealot on Hold position can be used to fill in the gap leading into the Protoss player’s base, preventing Zerglings from entering the main. Hold position is superior to just placing the Zealot in that spot without any commands, as the Zealot could then be drawn out by Zerglings, which could then just run by into the main.

Another good technique for using Hold Position is so that you can perform the Magic Box technique as a Zerg player versus a Terran player. The “Magic Box” was a strategy created to help players not lose all their Mutalisks to Thors. Thors deal in splash damage, and Mutalisks tend to clump up if you right click on a single entity to focus it down. The end result is that 3 Thors can take down large numbers of Mutalisks thanks to shared splash damage. One way to prevent this from happening is by using the Magic Box technique. When your Mutalisks fly, they actually tend to fly fairly spread out. When they get to their target location, you can press “H” to put them on hold, and they will automatically stay spread out, but still attack whatever is underneath them. This way, each Thor attack will only hit 1-2 Mutalisks rather than the whole pack.

As a result, if you want to fight Thors with Mutalisks, you need to fly the Mutalisks directly over top of the Thor and then press H. The Mutalisks will spread out more so it will be very hard for the Thor to kill them in a reasonable time due to no splash damage.

Mini-Map Commands

Another great way to improve your efficiency in Starcraft 2 is to use all the hotkeys we have discussed in conjunction with your mini-map. Your mini-map can be interacted with using the command hotkeys and shortcuts we have discussed to provide a much faster way of issuing commands without changing the position of the camera.

For example, imagine you want to give a Medivac a command to move along the outskirts of the map and then drop its units into the enemy base. As discussed before, you can hold shift and click along the outskirts of the map and then press “D” and select where you want the units dropped in order to perform the drop automatically. However, if you moved the camera along the edge of the map and shift-clicked along the way, it could take 5+ seconds to implement this command. If you wanted to do multi-pronged drops, this would simply take up way too much time and your army and base would be vulnerable in the process.

Instead, you can issue your shift clicks for movement along the edge of the mini-map. In this case, you would hold shift and then right click along the edge of the mini-map. You could even use “D” and click on the mini-map where you want the units to drop. Commands can be issued on the mini-map like this and work just like if you had moved the camera and watched as you queued up the commands. However, using the mini-map takes a fraction of a second to give units commands to move across the map whereas moving the camera takes much longer. This is how players are able to coordinate multi-pronged drops.

The mini-map can be used for all sorts of things. One effective strategy for using this is with the Inject Larva function. You can pull up the control group where your Queens are bound, hit “V” for Inject Larva, hold shift, then left click on approximately the correct spot on the mini-map where each Hatchery is that you want to inject Larva. You only have to click in the approximate location for this to work, and it allows you to Inject Larva without changing the camera focus and it also only takes about 1 second to inject multiple hatcheries, saving you large quantities of time.

Strategies for Rally Points

Rally points are another way that you can significantly improve your efficiency in Starcraft 2. Rally points cause new units to move to the target location as soon as they are spawned. Rally points can be set by selecting your production facilities and right clicking on the spot on the map where you want these units to go. Rally points can also be set by right clicking on the mini-map. Every building can have its own rally point if you set the rally points individually. Additionally, if you have your Town Hall highlighted and right click on a geyser or mineral patch, newly produced workers will start gathering at the rallied point automatically. Your workers should always be rallied somewhere, either to a mineral patch or wherever you want them to go in order to build the next building.

Since the Hatchery produces nearly all of the Zerg units, Zerg rally points are a bit different, though this is not necessarily a disadvantage. If you have a Hatchery highlighted and right click on a mineral patch, Drones produced will automatically rally to the mineral patch and begin harvesting. However, regular units produced out of a Hatchery have a separate rally point (Unit Rally Point), and right clicking in any location other than a mineral patch or geyser will change the Unit Rally Point. This means you do not even have to press a hotkey to use separate rally points for Drones and offensive units.

I recommend setting the unit rally points for all your Hatcheries to a central location, as this prevents unrallied units from getting “lost”. Due to the size of the Drone model, Queens, tall structures like the Spire and Hive, and clusters of Overlords, it is very possible for smaller, unrallied units like Zerglings, Roaches, and Hydralisks that have spawned to remain hidden in the mineral line, never spotted or used until the end of the game. For this reason, you always want to set your Hatcheries’ rally points so that they are in an easy to spot central location.

Additionally and perhaps most importantly, each egg has its own rally point. This is very convenient as it lets you to send new units to where you need them without changing the default rally point of the Hatcheries. After you select your larva and produce units (via hotkeys of course), you can right click anywhere on the map or mini-map to set the rally point for the eggs that you currently have selected.

Note that units being rallied (except for Swarm Host Locusts) rally on the move command, not the attack command. This means that they will ignore enemy units that they are being rallied past. A very common and effective strategy is to intercept enemy reinforcements that are being rallied to the front lines with fast units like Zerglings.

Rally Point Tricks

There are two additional methods for using rally points to improve your unit control and efficiency. The first is to set your rally point to your frontline units. In other words, if you are making Medivacs at your Starports and want them to go right to the front lines as soon as they are finished, you could rally your new Medivacs to wherever your current Medivacs are by selecting your Starport and right clicking one of your current Medivacs. Now, new units out of the Starport will automatically rally to that Medivac, wherever it is on the map.

The only downside to rallying new units to old units is if the old unit dies that you were rallying new units to, you no longer have a rally point for your buildings. You can get around this by holding “shift” when setting the rally point and right clicking on multiple units. In the Medivac example, you could select your Starports, hold shift and then right click on all of your Medivacs. This way, if the first Medivac dies, your units will rally to the second Medivac you clicked. If the first and second die, new units will rally to the third Medivac, and so on.

A second way you can use rally points is to set your rally point for your production facilities to an enemy’s building. This is done just by right clicking on the building. Produced units will automatically start moving towards the enemy’s building and begin attacking it. This works particularly well in ProtossvsProtoss match-ups that make it to the late-game. You can produce 2 Immortals at a time and rally them to your opponent’s most exposed Nexus. Two Immortals can usually rush down an enemy Nexus before they can actually be killed by the enemy thanks to the Immortal’s bonus damage against buildings and the Immortal’s Hardened Shields. This is a very effective trade as the lost mining time for your opponent will be a major blow to their economy. The best part however is that this whole harass

can be set up without any real input on your part. While you are controlling your main army, you can tab to your Robotics Facilities via hotkeys, produce Immortals via hotkeys, and then automatically rally them to harass your opponent's base. As you can imagine, this is very effective as you can keep doing it throughout the game without ever needing to avert your attention from your main army!

Zerg Hotkeys& Efficiency Tricks

Using the previously mentioned hotkeys and strategies, as a Zerg player, there are a few things specific to this race that you can do to significantly improve your efficiency and performance. The first and most important thing you can do as a Zerg player is to master the Inject Larva trick. I have found the most convenient and fast way to do this is via using the mini-map. Here is how it works:

- Bind all of your Queens responsible for Inject Larva to a hotkey. If you have additional Queens that you are using for creep spread, do not bind them to this key. Bind creep-spreading Queens to a separate control group.
- Press that hotkey to bring up the group of Queens you want to inject.
- Hold Shift.
- Press "V" for Inject Larva.
- Rather than shift the camera to each Hatchery, click on the approximate location on the mini-map where each Hatchery that you want to inject can be found.
- Clicking on the mini-map is done while holding shift. This will cause the Queens to Inject Larva without actually moving the camera. You can inject by clicking on the mini map!
- By holding shift, you can do all your clicking on the mini-map at once, without having to keep hitting V.

This will cause the nearest Queen with energy to inject larva at its closest targeted Hatchery. The closest Queens will automatically be selected, so this process is very quick. It allows you to inject larva without actually needing to look at your Hatcheries or even select them at all. Note that if there is no nearby Hatchery where you are clicking, you will get an error message. With that said, the range is pretty generous. If the Hatchery currently has an Inject Larva already active, you will also get an error message.

There is some learning time involved, but as you play the same ladder maps, you will begin to memorize exactly where you need to click on the mini-map to inject larva. As you get comfortable with this strategy, your skill level will significantly improve as a Zerg player as you should never be missing Inject Larva. If you build a macro Hatchery (that is one Hatchery right next to another in order to increase production), just click on the same area twice when injecting, as there will be some overlap in the range of each Hatchery. Just make sure there are two Queens here or that the 1 Queen near each Hatchery has enough energy for two injects. Otherwise, your Queens with energy that might not nearby may move out of position.

The Backspace Method

An alternative method for injecting Larva is the Backspace method. If you bind your injecting Queens as recommended above, instead of clicking on the mini-map. You can press backspace to center the camera on a Hatchery, then click to inject larva. You can tap backspace and click rapidly to inject very quickly.

This is actually slightly faster than injecting on the mini-map, but has the downside of occasionally missing an inject (if you hit backspace twice and miss the click). It also has the major downside that it shifts the camera. I like to be in control of my camera and will trade the extra half a second lost by clicking to not have to shift the camera.

However, both are effective strategies – pick whichever you prefer.

Drop & Unloading While Moving

A trick that you will want to master, particularly as a Terran player, is the ability to unload units from a Medivac, Overlord, or Warp Prism automatically while the structure is moving. A lot of players have seen professional players do this but have no idea how to do it themselves. The reason is you do not actually click on the ground when you want to unload while moving but rather on the dropship itself.

Press the “D” key for Unload All. Next, click on the actual ship. If you have multiple dropships that you want to unload in this manner, hold shift, press D, then quickly click the ships you want to start unloading.

Overseer Hotkeys

As a Zerg player, you will always want to put an Overseer or two on its own unit group. If you run into cloaked units, you need to be able to pull over detection in a flash. Too often players have to chase down their 1 Overseer when they finally run into cloaked units or worse yet have to make one from an Overlord. This is particularly true in Heart of the Swarm, where cloaked units and builds are even more common than they were in Wings of Liberty.

Protoss Hotkeys

Protoss players have a trick similar to that of Zerg players and that is using hotkeys and the mini-map to enhance one of their unit’s commands. In particular, the trick involves the Mothership Core (or Mothership) and its Mass Recall ability.

The Mass Recall ability (hotkey "R") causes the Mothership Core to warp to the targeted Nexus, bringing your units underneath the Mothership Core along with it as well. It is great for escaping dangerous situations, escaping after a drop, or returning to your own base to handle a drop. The problem most players have with this ability is that using it takes too much time for it to be effective. After all, if you need to get out of a bad situation and you have to move the camera away from the battle to target a Nexus to use Mass Recall on, you are likely going to lose a lot of units. The same goes for trying to use Mass Recall to defend against drops – if you try to move the screen to use Mass Recall, by the time you actually get the Mass Recall off the damage has already been done.

The solution is to use the hotkeys and the mini-map. If you press "R" for mass recall, you can then left-click on the mini-map at the approximate location of the Nexus you want to travel to. This takes less than a second to execute and accurately allows the player to cast Mass Recall on the Nexus of their choosing. Defending your base against enemy drops in this manner is a breeze as you can quickly press "R" and then click on the mini-map on the base where you see flashing.

You can also use this with the "Backspace" key. Press "R" for Mass Recall, then quickly hit Backspace and click. These actions will teleport you to the nearest Nexus. While not as useful when trying to defend against attacks, it is a little bit faster when trying to escape dangerous situations.

Another trick you need to learn as Protoss is how to set up Force Fields. The fastest way to do this is to use the "Shift" function. When you see a Protoss player throwing up an instant wall of Force Fields, it is done via hotkeys and the "shift" key. I think it goes without saying that trying to click the "F" for Force Field are of course going to be way too slow, though many players do not realize that holding shift is the key to good Force Fields.

When you hold shift and select a group of Sentries, the game will find the most efficient path for laying down these Force Fields. It will pull whichever units need to move forward to drop the Force Fields in the fastest way possible. If you do not hold shift, and click your Force Fields, some of the Force Fields may not go down.

Imagine if you had 1 Sentries with 150 Energy and 1 Sentry with 50 energy, and needed to make a wall with 4 Force Fields. Without shift, you could press "F" --> Left Click (placing the first field), "F" --> Left Click (placing the second field), "F" --> Click (problems arise here), and "F" --> Click (problems arise here). The problem arises when you begin to drop more Force Field than units you have. If the Sentry with 150 energy has not yet dropped a Force Field when you issue the command to build (it could still be moving into position or range to cast it), then casting a 3rd Force Field will automatically cancel the previous command, messing up your wall.

Holding shift on other hand will use whatever Sentries are closest, and will allow you to queue up multiple Force Field commands from a single Sentry. As an added bonus, you do not have to press F multiple times to keep bringing up Force Field. Hold shift, press "F", then click wherever you want your Force Fields to go, and your highlighted Sentries will automatically disperse into the most efficient way

of dropping those Force Fields. It could be that 1 Sentry uses all its energy, or that different Sentries cast the Force Fields, whatever is most efficient in that situation.

Finally, Protoss players should know how that there is a way to Chrono Boost multiple buildings a bit faster. Select your Nexus, hold down “C”, and click all the Gateways (or other buildings) that you want to Chrono Boost. If you do not hold down “C” and simply tap C, then click a building, you will have to keep hitting C for each Chrono Boost you want to use. Holding down C lets you quickly click on all the buildings you want to Chrono Boost without needing to press “C” again.

As a side note, you should always place your buildings of the same type within one “screen” worth of distance to each other. This way, it is much faster and easier to Chrono Boost all of them in the late-game when you need to re-macro quickly. You do not want to have to shift the camera when trying to Chrono Boost multiple structures.

Terran Hotkey Efficiency Tips

The two most important Hotkeys for Terrans in particular to know are Halt Construction (“T”) and Select Builder (“Q”). Halt Construction will cause an SCV currently building a structure to stop building (so you can move it) without actually cancelling the building. This is very useful when an enemy is using a Drone, Probe, or SCV to try to kill your constructing workers in the beginning of the game. You can use “T” to grab the SCV and move it to safety without actually having to cancel your structure.

The “Select Builder” serves a similar function. If you select a building currently under construction but really want to get access to the SCV building it, pressing “Q” will shift your current selection to the constructing SCV. This is useful for the same reason Halt Construction is useful.

Custom Hotkeys

In order to improve efficiency (or if you just do not like the hotkeys assigned) in Starcraft 2, you can change them in-game. Open up the menu and select key bindings in the bottom left, and set up a profile. The game will not let you save over the default profile if you change keybindings, so be sure to set up a profile name before making your keybinding changes. Otherwise, it will not save, and you will have wasted a lot of time changing your keybindings!

The goal of setting up your custom hotkeys is so that you can access every hotkey in game without needing to move your hand from the keyboard. As discussed in the previous section, you want to be able to keep your left hand over the home keys (ASDF) and your right hand on the mouse at all times. This gives you optimal control over the game at any one time, allowing you to react quickly and efficiently to things that come up during the game.

Custom Hotkey Changes - Recommendations

The hotkeys in Starcraft 2 are mostly in reasonable positions. The “Backspace” key is not really in a convenient location and likely the most useful for all players. It can be rebound to “Space Bar” without losing much functionality in my opinion.

You can save a few seconds here or there by setting up custom hotkeys so that you never have to move your left hand under any circumstances when playing Starcraft 2. For example, to upgrade Zerg Melee Weapons, you have to press the “M” key. This is not very convenient and may cost about ¼ of a second to perform.

While every second counts, the amount of time you save from shifting all the keys in this manner is not significant, so I am not going to go over all of the keys you can change to slightly improve performance. Whether or not a key should be moved depends as much upon personal preference, hand size, and the keyboard you are currently using, so use your judgment when coming up with custom hotkeys.

Overcoming Physical Limitations

Custom hotkeys can be used if you have some sort of disability that otherwise does not give you full access to both hands. If you only have one hand, your best bet will be to get a high-end gaming mouse with a variety of buttons. You could then re-bind many of your important keys to buttons on the mouse. You could then control the game without your hand ever having to leave the mouse. This will be necessary if you want to play Starcraft 2 at a high level with only one fully-functioning hand. If you are moving your hand back and forth between a mouse and a keyboard or trying to click everything on the screen, you will not be as fast as you could be with a special mouse that has everything bound to it.

If you only have one hand you can use, you will want to have 5 buttons on the mouse dedicated towards control groups. You also want to have the basic commands like “attack” and “hold position” on the mouse. You will want to rebind every unit so that there is a few buttons on the mouse that cover all the spells. Mouse button 7 could always be “ability 1” depending on the unit. You may not have room for less-used keys like Patrol and you will have to likely have to click some of the build structure buttons.

If you are left-handed, there is an option in the keybindings to turn on left-handed mode. I would actually recommend not doing this and instead using your computer like a right-handed player – that is with your left hand over the command keys and your right hand on the mouse.

I can hear the groans now from disheartened left-handers complaining that confirming to right-hand standards as archaic and unnecessary in an era of modern technology. However, this fears are misplaced, as one you get really good with hotkeys, the left-hand actually is your primary method for interacting with the game. The less you use your mouse for commands (your right hand) the better, as your keyboard can do nearly all of the work in Starcraft 2.

Now that you know exactly what mastering build orders and your hotkeys consists of and changed your system settings and hotkeys accordingly, we will discuss the exact training program you will want to follow in order to do exactly that.

Practicing What We've Learned

The phrase “practice makes perfect”, a common and generally accepted idiom of the English language, is not exactly true. The expression insinuates that if you practice something frequently, you will get better at it. A lot of people spend a lot of time on various hobbies, such as playing poker, tennis, or video games, but never really get any better. The reason for this is that practice only makes you better when your practicing is designed to actually make you better at something. The more appropriate expression is “practice makes permanent”. This is not semantics – if you practice bad habits like not using hotkeys, it will be harder to break the clicking habit the more that you play.

Even if are not performing bad habits in-game, if you are not drilling into specific aspects of your gameplay, you will not get any better with practice. For example, if you play a lot of ladder games but never nail down the exact second-by-second build order, you will not improve your skills at nearly the rate you would if you were more specific with your practice.

The training exercises in throughout this book are specifically designed to make you better at Starcraft 2. Unfortunately, this is not always fun, and sometimes it is hard work! Fortunately, the practice programs in this book can significantly improve your ranks in Starcraft 2 in a short amount of time. The strategies in this book do not turn out “forever silver” or “forever bronze” players if you actually put in the time and effort. Note that in this case effort is actually more important than time. You do not need to play 5 hours a day to be a highly ranked Starcraft 2 player, and in fact 1 hour of playing and 1 hour of study a day is more than enough to be reach the master’s league, a ranking the vast majority of Starcraft 2 players will never reach, even those that spend several hours a day playing games!

Speaking of time and efficiency, I have broken down this practice section into two sections: Build Orders and Hotkeys in the first section, and everything else in the second section. As discussed earlier in the book, mastering a few build orders as well as all the hotkeys is the easiest and fastest way to improve your rankings significantly in Starcraft 2. However, if you want to invest more time into Starcraft 2 and improve your ranks even further, there is a large amount of Starcraft 2 knowledge available in the second section of the book. This includes things like army composition, good unit combos, counters to enemy builds, micro tips, map-specific tricks, and more.

Please do not get distracted by the vast amount of Starcraft 2 knowledge in the latter half of this book. Learning this information will improve your ability to play Starcraft 2, but it is not a substitute for learning the builds. You might know the ins and outs of the ProtossvsProtoss match-up in Starcraft 2, but if your build is not excellent, that knowledge is worthless! You’re going to get rolled every time by a well-polished, well-timed 4-Gate if your build is not at least as fast as your opponent’s. Think of strategy and match-specific knowledge as “low payoff” – it is only something to do after you have already mastered your high payoff exercises (that is copying and practicing builds, learnings hotkeys, and using replays).

Game knowledge becomes more and more useful the later and later a specific match lasts. If you are losing a lot once games go beyond 15 minutes, odds are your knowledge of army composition (and how to use that army versus what your enemy has) is lacking. However, at least half of games never make it to the late game! Reading strategies is a lot more fun and empowering than practicing builds, but practicing and mastering a few builds is essential to rapid advancement in Starcraft 2.

Practicing Build Orders

Getting and practicing build orders was discussed earlier in this book at length. Before we begin practicing build orders, remember that you need a detailed build order so that you can practice in the first place.

There are 9 build orders in the appendix section of the book that you can use. There is one build that can be used against each race by each race in Starcraft 2. In other words, if you are a Zerg player, you will want to master the builds listed as ZvZ, ZvP, and ZvT.

However, due to changes in the **meta game** as well as balance patches, I cannot guarantee that these builds will not become obsolete over time. The meta game refers to the overall set of popular strategies that players commonly use on the ladder. There are many effective builds and strategies which have yet to be discovered, and as players uncover them and they become widely adopted, formerly popular builds may not be effective against these new tactics. For example, the “Macro CC”, that is building a very early third Orbital Command in the main base for extra SCV and MULE production, was not really discovered as a popular strategy until about a year after Wings of Liberty was released. Now, given how effective it is, it is one of the most common builds in Starcraft 2!

Balance patches can change the effectiveness of a variety of builds. For example, the 4-Gate was the de-facto build for use in ProtossvsProtoss, but a balance patch changed the length of time required to research Warp Gate Technology. After that change, the 4-Gate was still good, but it also opened the way for other builds to become viable even at the professional level.

In order to stay current, the best place to get additional build orders is to copy builds from professional-level replays. When watching a professional play, you need to copy down their exact production timings. Note what they build, the supply count at the time, and the time on the game clock when they take that action. When you go to practice this in-game, you need to not only master the build order but also the build timing. What I mean by this is that if you are copying a pro-level 4-Gate as Protoss, and the professional player starts the attack at the 6:05 mark, you need to be starting your attack at the 6:05 mark. If it takes you until 6:45 to start your 4-Gate attack, you will not be at the professional level!

When possible, it is best to be an early adopter of new builds picked up from professional replays like this. Not only are they likely to be among the most effective builds, but your opponents will have less

experience by default playing against new builds and will be less-equipped to defend against these novel strategies.

Getting Replays

There is a list of sites to download pro replays at below. Do not copy builds or watch replays from players who are not pros at least in the grandmaster league. Even those however are not as ideal as getting pro or grandmaster Korean replays or professional-level replays from non-Koreans. Many of the pro-level players do not ladder much as they practice in house against their teammates. Many of the best players with the fastest builds do not have high ladder rankings.

Here is a list of sites you can download replays from:

<http://www.gamereplays.org/starcraft2/replays.php?game=33>

<http://gosugamers.net/starcraft2/replays/>

<http://www.sc2replays.eu/>

<http://www.sc2-replays.net/en/replays>

I prefer to use the gamereplays.org link and get replays from the “Events” tab – these are replays from major tournaments so you know the players competing are amongst the best in the world.

Practicing Build Orders

When you decide on which build order you want to practice, you want to either print it out or write it down on a sheet of paper. Again, there are build orders at the end of this book as well as blank charts you can use to make copying builds easier. Regardless, you need a physical copy of the build you want to practice. If you do not have a printer, copy the builds down by hand. This will allow you to easily shift your vision between the build order and Starcraft 2. Do not play Starcraft 2 in non-fullscreen windowed mode and try to tab back and forth between a document containing the build order and Starcraft 2, as you do not want to get used to playing Starcraft 2 in a window. Make sure you have the separate piece of paper to reference.

Once you are ready to practice the build order, create a custom game against a single computer opponent. Set the opponent to “Very Easy” and “Economic Focus”. This will make sure you do not get attacked by the enemy any time soon but it gives you a few enemy bases to practice drops and harass attacks on should they be included in the build you are copying.

Make sure you choose a ladder map for practice purposes and then always pick that map when working through the drill. While you can ultimately practice a build on many maps, it is best to learn the build in the first place on the same map. The less unknown, the faster you learn, so no need to slow things down by changing the map each time you play. Once you master the build completely, you can start to add in other maps. Begin replicating the build you have on the sheet of paper.

Step by Step Strategy for Practicing Builds

Estimated total practice time per build: 10 hours

- You should read your build as step-by-step instructions to be performed in that exact order.
- You want to pause the build after each step, so you can read the timing of the next step. Pressing the “F10” key will automatically pause the game in a single-player computer game.
- Each time you pause the game, read the next step and the time associated with that step. Check your game clock and make sure it is aligned with whatever you have written down on your build paper.
- Repeat this until the entire build is replicated.
- If you fall behind, figure out why and where you messed up, then restart the build from the beginning.
- Repeat this 10 times, pausing after each step. This will take about 2-3 hours of practice time for a build taking 8-10 minutes.
- For builds that go beyond 10 minutes (such as Stephano's infamous 200-supply Roach attack), you will likely need to repeat this 15 times before you can proceed to the next step.

- Once you have run through the build 5-15 times, pausing after each step, cut down your pausing so that you are only pausing every 2-3 steps on the list. For example, if you pause the game at 3:00, and the next 3 moves are building a Probe at 3:02, building a Gateway at 3:08, and building another Probe at 3:20, you would try to remember all 3 of those moves and their timings before pausing again.
- Repeat this 5-10 times, pausing every 2-3 actions on your sheet. Since less pausing is required here, this should only take about 1-2 hours of practice time.
- Once you get to this point, you want to try to replicate the build on the sheet with only pausing every 30 seconds. After 30 seconds of play, pause, and double-check your work with what you have written down on your build order sheet. Note that by “double checking” your work, compare your supply count and the game clock to whatever your build indicates is correct.
- Repeat this 5 times, pausing every 30 seconds. This is about 1 hour of practice time.
- Perform the same drill, repeating the build you want, but this time pausing only once per minute. Make sure you have not fallen behind the timings written down on your build sheet.
- Repeat this 5 times, pausing every minute. This is about 1 hour of practice time.
- Perform the same drill, this time only pausing every 2 minutes. Repeat this 5 times. This is again about an hour of practice time.
- Next, try to perform the entire build straight through. After all the repetition you have performed previously, this should not be difficult. However, remember that you do not want this to be difficult, you want it to be automatic. After all, the whole point of this exercise is to free up your mind so that you can focus on other things like defending and initiating attacks rather than macro.
- Repeat this 10 times. This is about 2 hours of practice time. Practice it until it is smooth.
- Up until now, you should have ignored scouting and attacking the enemy up until this part of the practice process.
- Now, try to replicate the way the professional is scouting the enemy when they are performing the build you copied (if applicable). This is another reason why it is ideal to create your own build orders when possible, as you get to see when harassment and scouting occurs.
- You will find that it is much easier to control your scouting worker after you have already mastered the rest of the build. Once the rest of the build is on auto-pilot, your brain resources will be free to control your scouting worker.
- You will want to practice scouting though as you need some practice shifting the camera back and forth between your main base and your scout. The Double Tap method is good for this – bind your scouting worker to a control group and bind your Town Hall to another control group. You can then shift your camera back and forth between the two locations on the map by tapping the hotkeys for the control groups. You want to be very comfortable with scouting like this and it is hard to learn new things in game due to the high stress level of ranked competition. It is hard to learn anything in such overwhelming circumstances, so scouting should be mastered, even when it is just a computer opponent.

- Note that not every pro scouts with their workers, particularly Zerg players. Zerg players often have the same opener regardless and instead rely on Overlords to supply early information.

Once you have mastered the build privately, you can begin to perform this build in a 1v1 match up.

Using Your Build in 1v1s

Estimated practice time: 10 hours

When you first begin to use the build you have been practicing, you should use it in every game you play, over and over again. This will work out all the kinks in the build and really help cement this build as a long term memory in your mind. Understand however that this may result in a few extra temporary losses. After all, you may be practicing a build that is great for ProtossvsZerg, but is absolutely dreadful for Protoss vs Protoss. This is okay, as you will get your ranks back and then rank a lot higher once you master the build you are working on!

If you are really worried about losing your rank, you can always play in an unranked match. This is actually a good thing to do initially, until you are comfortable. The lower stress of unranked matches makes it easier to practice and learn from builds that you are trying out for the first time. However, eventually, you will want to ladder with the builds as you tend to get better opponents in the ladder. You will see better counters and responses to your build and learn to adapt to these responses. In unranked games, players often do not respond predictably or logically to your builds or actions due to a lack of skill, which can ultimately result in a lack of learning when you are already very efficient at performing a build.

After about 10 hours of using this build in a 1v1 match, you should have been able to work out many of the kinks and strategies associated with that build. This learning process can be made much faster by using replays as discussed in a later section.

Learning New Builds

Once you have mastered one build, simply repeat the process you used to master your first build. Ultimately, you will want to learn 1 build for each race combination. When you begin to learn new build for the first time, you should only practice that build. Make sure you have practiced it 25-30 times in a single player game before you break it out on the ladder.

If you do decide to ladder in the middle of practicing a new build, use your old builds on the ladder. Remember that learning under pressure with a large number of variables is extremely difficult and does not really happen. Additionally, remember that learning things the “wrong” way will make those

connections harder to break in the future. It is best to learn the build in a private game and only use it against ranked opponents once it is very smooth.

You may ultimately want to learn more than the 3 recommended builds. This can improve your skill level even further if you have a lot of time to practice. However, if you do not have a lot of time to practice, learning too many builds may actually reduce your ranking. It is best to figure out how to make 1 build work vs each race match up and use it over and over again. Even after a build is fully memorized, more performance gains (and higher win rates) are realized the more you play with a specific build. You begin to learn the appropriate responses to your enemy's response to your build. You will become much more effective transitioning into the late-game when opening with a particular build, an expertise you will never develop if you are always using different builds.

Tips for Success – Performing Refresher Runs

A long-term memory is **primed** by its recent recall into short term or working memory. This means that memories stored in your long-term memory are easier to bring into your working memory if they have recently been remembered or refreshed in your memory. To clarify: things stored in long-term memory can be recalled easier and with less effort if they have been recently repeated.

For example, imagine you knew all the words to a popular song 5 years ago. You know the lyrics, but you cannot recall them off of the top of your head right on the spot because it has been so long since you hear the song or sang the words. Now imagine you were given a sheet with the lyrics on it, allowed to read through them for a few minutes, and then asked to sing along with the song. You could then likely sing along to the song with ease, whereas someone who had no experience with this same song would not be able to perform such a feat after a brief glance at the song's lyrics. This is because reading the lyrics on the sheet primed a long term memory that you already had for recall, making it very easy to remember.

What does this have to do with Starcraft 2? Well, before an extended ladder session, it is ideal to refresh the builds you have worked on quickly in a private or un-ranked game. Just perform the first 5-10 minutes of your opener leading up to an attack and then try to end the game. This warm-up makes it much easier to perform your build in a ranked game, and it also serves as a nice refresher, warming up your fingers and stimulating your memory of hotkeys.

Of course, this does take up time, so if you only have 30 minutes to play, you may not have enough time to perform these refresher runs, and in this case you may just want to jump right into a single ladder game.

Using refresher games like this is extremely important when you take multiple days away from Starcraft 2 or even when you take a few weeks off from an old build to learn a new one. You might not need to perform a refresher for a build you were just practicing yesterday, but if you went on vacation for a

week, or took a break from Starcraft 2 for a month, performing an unranked walk-through of each build is a good idea before you jump into the ladder.

Tips for Success – Watch Your Replays

Once you have mastered your build order and are playing on ladder, be sure to watch your replays after each match, win or loss. Initially, you should be trying to see if there are any places where you can improve the efficiency of your build, such as inactive SCVs or Probes, better building placement, and the like. This is particularly important at the start of using a new builds as the nuances of different maps may slightly alter each build, and you need to account for this.

Once you are efficient and your timings are similar to that of the professional player you are emulating, then you should begin to examine the actual battles of each replay. You can watch the replay at a higher speed and then slow down during each major engagement. This is a great way to see what you did right or wrong in each actual battle and is a great way to improve your tactics. Later sections of this book will go into more details on how to watch your own replays to improve your skill level.

Practicing Hotkeys

The exercises used to practice hotkeys have been discussed earlier in the book. There are three primary drills you should engage in to improve your skill: only using hotkeys, reviewing the chart, and mentally rehearsing the hotkeys.

Only Using Hotkeys In-Game

Total practice time: N/A

This is very simple, but highly effective: never allow yourself to click on any command in the game that can be accessed via a hotkey. If you do not know the hotkey for some of the advanced buildings or structures, glance over the unit card, and read the hotkey and then press that key to execute the command or build the structure. The mistake most players make is that they learn most of the hotkeys, but for some reason they never remember all of them. When they need those hotkeys in-game, the stakes are too high to stop and read the hotkey, so they panic and click on the key they need. This never gets any better on its own because practice makes permanent, not perfect. Never allow yourself to click anything and it will not be long before you have memorized all of the hotkeys.

Study the Hotkey Charts

Total practice time: 1 hour

There is a chart at the end of this book (just after the sample build orders) that includes the hotkeys for all the races. Print out this chart and study it for a few minutes at a time, a couple times a day, until you have memorized all the hotkeys. As mentioned in an earlier section of the book, it is much more effective and efficient to review the hotkeys a few times a day for a few minutes at a time, rather than try to sit down for an hour and memorize the whole thing. Cramming works if you want to pass a test the next day, but as many college students know, these memories do not seem to stick around for long!

Mental Rehearsal of Hotkeys

Total practice time: 2 hours

Once you think you are comfortable with the previous two drills, you can cement the hotkeys into your long-term memory by mentally rehearsing the hotkeys. The exact drill sheet for each race can be found in the appendix section. Mental rehearsal is just repeating and reaffirming the hotkeys to yourself, consciously thinking about what specific hotkeys belong to each particular unit.

This section consists of two areas: a list of units and buildings as well as an answer key. The list of units will just say the unit name and nothing more. You should be able to look at each unit and structure on the chart and mentally say to yourself all hotkeys that are associated with that unit. The answer key can then help you confirm whether you were right or not. You can print these two sections out to study with. If you are a Terran player, you will read the practice sheet where it says "Marine". You should then be able to say to yourself, the Marine is produced with the hotkey "A" at the Barracks. The Marine can learn the Stimpack ability with hotkey "T". Its technology upgrades consist of Stimpack with the hotkey "T" and Combat Shield with the "C". Its weapon and armor are upgraded via Infantry Weapons and Armor, hotkeys "E" and "A" respectively.

Do this for all the units and structures on the chart. Each time you do not know an answer, simply refer to the answer key. If you can perform this task for every unit, not only will you easily know all the hotkeys, but you will begin to make other associations with each unit. You will know all of the upgrades available to each unit and know what units benefit from which upgrades. It will improve your overall skill level and increase your knowledge of the Starcraft 2 units. Mental rehearsal also brings in a variety of brain areas, speeding up learning and improving the speed of recall. Once you have consciously mastered the hotkeys in this manner, they will soon become very rapid when you execute them in-game, no longer requiring you to say to yourself, "okay I need Marines, that is hotkey "A", but rather you will just press the control group that contains your Barracks and quickly mash "A" without even thinking about it consciously.

The Other Half of Starcraft 2

While mastering a few build orders along with the hotkeys and controls is more than enough to achieve a good ranking in Starcraft 2, it is admittedly only a part of the picture. In order to be truly great at Starcraft 2, you need to master a variety of other aspects of the game.

Fortunately, if you have already mastered a few builds as described in the previous sections and execute them well, you will be able to learn the other aspects of Starcraft 2 much faster. By spending less mental resources thinking about your build order, you will be able to pay more attention to things like unit control and army composition, learning much faster in the process.

Unfortunately, this amount of total game knowledge you can benefit from in Starcraft 2 is vast, and learning enough information to significantly improve your ranking requires a large amount of time and effort! To put it in perspective, the multitude of tips and tricks you would need to learn and practice in order to go from Diamond to the Master's League requires more time and effort than it does to go from the Bronze to the Diamond league, which can be done just via mastering and executing build orders!

There are two ways to break down this information: global skills and drills as well as race-specific strategies. The "global skills and drills" section discusses practice strategies that you can use to acquire this sort of knowledge. Once you master a few builds and your hotkeys, this is the next step towards Starcraft 2 mastery.

The race-specific strategies section is a knowledge bank of for each race consisting of unit uses and strategies, counters, effective army compositions, scouting tips, and info on how to deflect common enemy tactics and annoying units and unit combinations.

WARNING

The information contained in the race-specific section can be a double-edged sword. The strategies are real and effective, but they are addictive. Players love reading about new strategies and unit counters. It is a novel experience, is fun, rewarding, and empowering. This becomes a problem because many players like to skip over the "boring stuff" - that is build orders, hotkeys, efficiency tricks, and the drills discussed in the global section below, and instead just skip to the strategies, tips, and tricks. Unfortunately, the "boring stuff" is where most of your skill gains are made.

Strategies are the icing on the proverbial cake, the edge that lets you win a tight game, the unique unit combination that lets you overcome a tough enemy army composition, or the long-shot trick that gets you back into a game where you are behind. Though vast in number, these strategies are not actually what will win you the most games. Most games can be won without specific race match-ups but instead just by tight, efficient builds, proper timings, and good macro follow-up.

Master a few builds, all of the hotkeys, perform the drills in the global section, and only then reference the race-specific strategy sections of the book. This is the most efficient use of your time.

This is not to say the strategies in the race-specific section will not make you a better Starcraft 2 player. They certainly can and will should you read these strategies and successfully implement them. However, there are over 75,000 words of strategy in the race-specific strategy section - reading these strategies and understanding them to the point where you can successfully include them in a game is very time consuming.

Remember too that learning is much easier when you already have a base of knowledge and can minimize the amount of unknown variables. With less unknowns (that is a basic knowledge of Starcraft 2, mastery over a few builds, and understanding of hotkeys), the strategy contained in the race-specific strategy sections will be easier to envision, learn, and ultimately implement into your gameplay.

Global Skills and Drills

Once you have mastered a few builds as well as all of the hotkeys and efficiency tricks in Starcraft 2, the next step to improving your ranking is learning everything else in Starcraft 2. As mentioned, this covers a lot of areas and is large amount of total knowledge. The skills and practice exercises in this section can be applied by players of all races and will result in dramatic improvements in skill and ultimately rank.

If you are worried about the amount of time it may take to "learn Starcraft 2", rest assured as there is one thing that makes this learning process a whole lot easier: **mirror neurons**.

The Power of Mirror Neurons

Mirror neurons are specialized neurons in the brain which allow us to quickly duplicate things that we see. These neurons are the physiological basis for the popular expression, "monkey see, monkey do". When we see another person performing a task, mirror neurons fire as our brain tries to mentally replicate what we just witnessed. The mirror neurons fire as they try to imagine how they could create the same sort of interaction in-game. It is easy to see mirror neurons in action in young children as children are constantly emulating the actions of adults and other children, learning to interact with the environment in ways beyond their innate ability. An example of this would be seeing an older sibling throw a ball, then running over and picking up the ball and repeating what they just witnessed.

How does this help us? Because mirror neurons make learning and executing actions much easier after we have witnessed another person perform them. In this case, who better to watch and learn from than professional Starcraft 2 players? We have already established that there are large banks of replays that show the best players in action that are available for free download on various websites. These replays represent a treasure trove of knowledge beyond just builds that you can pick up just by watching the games!

Anecdotal Evidence

In lieu of a study, as there is not any of the kind on Starcraft 2, here is an anecdote about my personal experience about the power of watching professional replays to improve your own skill levels. I took about 2 years off from actively playing 1v1 games of Starcraft 2 in the lull leading up to Heart of the Swarm. During this time, my APM for an average 1v1 game was about 90. Not bad, but not particularly good.

When I resumed playing in the weeks leading up to HoTS release, I noticed something strange: by my 5th placement match, my APM had jumped to 130! By my seventh match, I actually posted an APM

average for the game of about 150! This is not too far off from the professional level, and a marked improvement over what I had posted before watching these replays.

Over the past few years, I played some 2 on 2 here and there, messed around in the HoTS beta, and replayed the campaign, but we're talking about less than 20 ranked matches in the course of 2 years. I also played as Terran when replaying through the campaign, and on ladder I have been using Protoss recently (since I felt Protoss was my strongest race).

While I did not play many ladder games, what I did do over the past few years was watch professional Starcraft 2 matches for 2-3 hours a week. Every other morning I typically watched a game of Starcraft 2 with my breakfast, as well as a match once every few nights before bed. I did not particularly go out of my way to watch these matches, as it was just something I did in my downtime while eating or getting ready for bed.

My APM has improved significantly through the action of mirror neurons. Even though I did not personally play much Starcraft 2 in those years, my skills improved dramatically as each time I watched a professional game, I mentally "played" that same match!

Of course, there is more to it than that. Just like anything in life, some people get better and better the more they do something, and others just stay the same. While watching professional-level replays *can* make you a better player, a lot of players watch professional-level replays and never get any better. This is evidenced by the fact that Youtube casters like Husky and HDStarcraft have huge audiences, but there are not huge numbers of players playing at a professional level.

Just like with practicing build orders, there is a certain method for watching replays to get the most out of them, which is going to be revealed below!

Before Watching Pro Games

The most important thing you need to know before watching professional level replays is all of the hotkeys for your race as well as all of the efficiency tricks discussed in the previous section. Mirror neurons work by emulation - when you see something, your brain is trying to reproduce that action in itself. However, in Starcraft 2, there is no physical action to emulate and no person to watch - only the screen and the units they control.

Before emulating and learning by watching a professional player, you need to have what is defined in the research as well-defined **mental maps** and a rich **mental language**. The term "map" is a mental representation of practically anything in the brain. In this case, having well-defined mental maps refers to understanding the controls and interface of Starcraft 2. If you have a good understanding of the controls of Starcraft 2, you should have an idea of what hotkeys the player is using to control their units, how they are splitting up their control groups, and so on. Someone who has no knowledge of Starcraft 2

is not going to have an idea of what they are seeing or how a professional player is controlling or organizing their buildings and units.

Here are some examples for each race to help make this concept clear. As you are reading this, imagine the following:

- **Zerg:** The professional player that you are watching is playing a Zerg vs Zerg. He has multiple Infestors with energy and has just trapped a pack of enemy Mutalisks out of position with a Fungal Growth. You know that he has enough energy to take them out with a few Fungal Growths in a row, so you mentally rehearse the timings, aim, and hotkeys necessary to cast those chain Fungal Growths to take out those units. If you don't know about how fast Fungal Growth's projectile is, that its hotkey is "F", and that it lasts 4 seconds, then it is impossible to mentally imagine yourself playing as you watch the pro play.
- **Terran:** The professional player that you are watching is playing a Terran vs Zerg. He has a large Marine, Marauder, Medivac, and Widow Mine ball and is ready to push the center of the creep. The Zerg player has a lot of Banelings and Zerglings. You imagine how you would pull off the Widow Mines and burrow them at the edge of the creep just as the pro does. You then imagine the controls as the pro splits up their Marines, preventing Banelings from getting too many hits with a single explosion. You mentally hit "t" as he pulls off a few units to go up ahead and clear off creep tumors. After the Banelings get close, you mentally stim and run your units over top of the Widow Mines, springing your trap.
- **Protoss:** You are watching a professional playing against an early rush. He grabbed his natural early, and is now fighting off superior numbers with a few Sentries. As he drops Force Fields and splits the enemy army in half, you can imagine yourself doing the same thing mentally, holding shift and dropping the Force Fields appropriately. As the battle ensues, you try to keep tabs on the time that the Force Field is up, mentally refreshing it before it wears off.

With good mental maps, you can actively "play" the game even when you are not the one in control. When a pro Zerg player is chaining Fungal Growths, you are actively paying attention, doing the timings in your head, imagining pressing the "F" button, as if you were the Zerg player and in control of the match. When a pro Terran player is up against Banelings and Zerglings, you imagine yourself splitting up your Marines and Marauders, scanning and stimming with a small group of Marines to pick off creep tumors. As a Protoss player, as the pro player is defending an overwhelming rush, you imagine the Force Field placement before it happens, and see the buttons being pressed in your head.

Developing these mental maps for interacting with the game is as simple as learning the hotkeys as recommended in the previous section. You will get much more out of watching Starcraft 2 professional-level replays once you learn the hotkeys rather than if you started watching them without any game experience yourself. As an example of this, the first time you saw a pro Zerg player perform a very fast Inject Larva, you likely had no idea what you saw. It was so completely foreign to you that it simply did not register because you did not have a clear idea of how to replicate that action yourself. If you do not comprehend what you are seeing, you are not going to learn at all. Players who want to learn this trick

for the first time typically need to see it in action or read about how to do it in a block of text; they simply cannot pick it up the first time they see it, as their brain has no idea how to replicate what they just saw. On the other hand, if you knew how the trick was performed, seeing a pro player do is slightly faster than you were capable of doing it would lead to improvements in your own game.

Mental language refers to the names that we give to various chunks of information in the game. Top-tier players have a ton of nicknames for builds, strategies, and techniques, and simply saying the name is enough to call up a large amount of information. For example, to any highly-ranked player, "4-Gate" represents a huge amount of information. In particular, it is an early timing push that involves a Protoss player attacking an enemy with 4 Gateways worth of production, right as soon as Warp Gate technology finishes. It however does not only have to refer to builds. There is a variety of game language that you will pick up over time, some of which is accepted in the community and some of which you will create yourself for personal use.

The Importance of Shoutcasts

One of the easiest ways to build up your mental language is to watch **Shoutcasts**. A shoutcast is a professional-level game of Starcraft 2 with an "announcer" who is broadcasting the game and controlling the camera. Shoutcasts are great to watch for building up your Starcraft 2 vocabulary because the announcers tend to use a lot of Starcraft 2-specific lingo during their casts. Commonly performed events, builds, strategies, unit compositions, and other in-game actions already have a publically-accepted terminology. You will pick this up quickly by watching shoutcasts.

Note that shoutcaster's comments and strategy comments are not always accurate. Even if a given shoutcaster knew everything there was to know about the game, remember there is the whole problem of Dual Task Interference. A shoutcaster is trying to observe what is going on in the game, keep the camera in the right place, describe the action they see, and entertain the viewer. In the heat of the moment, a shoutcaster's brain might lock up, resulting in even the most sound strategist emitting a completely inaccurate statement. Imagine trying to talk on the phone while watching a replay. How accurate would you be able to predict the right moves or comment on strategy? With enough practice you would be decent at it, but you would never perform at your top level.

Here is a practice drill: each time a shoutcaster makes a comment about what the pro players should be doing or who is ahead in the game, mentally challenge that statement. Who is really ahead in the game? Is the shoutcaster right about their recommendations? How do you think the game would unfold if the professional heeded the shoutcaster's advice? The best part about this drill is that you get instant feedback on your questioning, as the game unfolds in front of you. You can then compare your intuition with that of the caster with how the game actually turned out. This is a powerful practice that can lead to rapid increases in skill and understanding of strategy.

Some good sources of shoutcasts:

HDStarcraft

<http://www.youtube.com/user/HDStarcraft> - This is my favorite shoutcaster and the recommended place to go for shoutcasts. I like HDStarcraft because he makes good observations about the game, mentions recent changes in the meta-game, and is not afraid to question the actions of a professional player. The way he questions whether or not something was a good decision and evaluates who is ahead in a particular game is a practice you will want to emulate yourself when watching replays, as discussed in the “how to watch replays” section below.

The only downside is that HDStarcraft does not produce a lot of content, usually only casting about an hour’s worth of games per week. Fortunately, unless you have a lot of practice time, you are not going to have much more than an hour or so a week to dedicate to shoutcasts, as discussed in the sample training section.

HuskyStarcraft

<http://www.youtube.com/huskystarcraft>

Husky is the most popular Starcraft 2 shoutcaster on Youtube. As a result, he tends to get a good variety of replays sent to him by pro gamers who want to be featured on his channel. He also talks very quickly, and is big on using Starcraft 2 lingo. For this reason, his games are good to watch and listen to if you are still building up that rich mental language needed to master Starcraft 2.

Husky also produces much more content than HDStarcraft, giving you more videos to watch. Husky is also pretty entertaining, so it is something you can watch to improve your Starcraft 2 skills when you are too tired or burnt out to play any more games or watch pro replays. For this reason, I like to watch these games before bed.

Day[9] TV

<http://www.youtube.com/user/day9tv>

Day[9] produces a daily video that typically breaks down a professional-level match. The video style is completely different from your typical shoutcast: he pauses the game frequently and talks about what is happening and what strategies are unfolding in the game.

This is both good and bad. It is good because he shows you a variety of strategies and explains things that you might not get on your own, such as the rationale behind building placement. The “bad” part about the way Day[9] structures his videos is that he often pauses the game and shows his face talking and takes the focus off the screen. While this may make for a more entertaining video, it is a disservice to mirror neurons and in general a huge distraction for people who want to significantly improve their skill level. It is harder to learn when you are listening to a person talk and watching their face than it is to learn when you are hearing a voice talk over the game that you are watching unfold.

The good thing though about Day[9]’s videos though is that Day[9] has, in my opinion, the most Starcraft 2 knowledge of any of the shoutcasters. The problem is they are time-intensive and subject to diminishing returns. I recommend watching them once in a while, say 1 video every 1-2 weeks, rather than watching them daily. Unless you have 40+ hours a day to dedicate to Starcraft 2, you will likely improve your rank and skill more by watching multiple replays in the same time-frame or actually practicing and playing in-game rather than dedicating too much time to watching these videos, given how long each video can be. If you only have 10 hours or so to practice Starcraft 2, you would not want to spend more than an hour a week watching this type of video.

IGN Pro League

<http://www.youtube.com/user/IGNProLeague>

The IGN Pro League channel occasionally puts up games and videos from pro tournaments. This channel often contains videos from high-ranking Korean players who play the game at a higher level than the “foreign” (i.e. non-Korean) players typically found on other shoutcasting channels. As a result, you see some of the finest examples of good micro and strategy on the games found on this channel.

Unfortunately, the announcers on these videos are not the best for beginners. Instead, they assume the viewer is up to date on the current meta-state of professional Starcraft 2, which sometimes makes the casts hard to follow along with. What I mean by this is that builds and strategies in Starcraft 2 in professional matches are constantly evolving. If “Pro Player A” constantly runs into the “Build B” over and over, Player A will eventually create a build (“Build A”) that is very strong against “Build B”. Once “Pro Player A” has practiced “Build A” enough times in the way described throughout this book, Player A will be very efficient and highly skilled at countering “Build B”. Other pro players of the same race will eventually spot “Build A” in action, and practice and copy the build. Once “Build A” has proliferated, other pro players will stop using “Build B”, as it is no longer effective at the professional levels. This evolution of builds is called the **meta game**.

As the meta game shifts, builds and strategies which may be highly effective as high as the Grandmaster’s League on the North American or European servers may not be viable in “Code S” in the GSL. If you are unfamiliar with these terms, Code S refers to the top 32 players in the world (mostly

Korean) who are competing in the GSL (Global Starcraft League), which is the most competitive tournament series in the world.

Shoutcasters on this channel tend to just assume that viewers are watching all of their broadcasts and are up to date on the latest meta game strategies used by these Code S players and throw around terms and comments under the assumption that you have this knowledge.

This becomes a problem when a common, effective, and easy to execute build that is very popular on the ladder falls out of the meta game in the pro community. To use a Wings of Liberty example, towards the end of Wings of Liberty, you would rarely see Code S pro games where a Terran player went for a “1/1/1 all in” versus a Protoss player. However, if you played on the ladder, you would see this build constantly. This build fell out of favor among Code S players just because Protoss players encountered it so many times and practiced versus it until they had the optimal build for countering it. Once Protoss pros became excellent at defending the 1/1/1, Terran pros stopped using it as frequently.

The regular ladder player does not practice in this way nor do they have enough experience to have a pre-rehearsed “anti 1/1/1 build” down to the last detail like the pros do, so 1/1/1 remained very popular even at high rankings in the ladder up until the release of Heart of the Swarm.

To summarize, while it is good to watch these top-tier replays with some regularity, you do not want to rely solely on videos from this channel when you are going through your replay drills or copying builds.

While you do not see as wide of variety of builds on this channel, one thing I do really like is that the games are much more realistic of what you would encounter on the ladder. Youtube shoutcasters tend to pick long games, whereas the IGNProLeague channel typically casts a series of games as part of a tournament.

What I mean by this is that shoutcasters do not like to put videos up on their channel where the games only last 5-7 minutes. They assume that their viewers prefer macro games that last 15+ minutes. Additionally, shoutcasters like to highlight games that feature unusual strategies. Picking games featuring new strategies or longer durations ensures that no two games that are featured on their channels are exactly the same. However, this is not representative of games on ladder. Lower-ranked players mistakenly think that all players at the top-tier of play never use 1-base builds because the only games they see are shoutcasted games. Pro players use aggression as often as bronze league players, you just might not realize it if you do not watch a “best of” series where you see 5+ games in a row.

When watching a series of game, you get a much better idea of what sorts of builds and strategies are effective on the ladder. These games often do not last very long and are not very flashy, but are effective. You miss out on these types of games if you only watch the other shoutcasters mentioned in this book.

Warning About Shoutcasts Builds

Watching shoutcasts is a great way to significantly improve your understanding of Starcraft 2. However, do not try to copy build orders from shoutcasts. Remember that when we make build orders, we are copying down every single action. You should not just include what things are being built, but the exact second they are being built, when and how abilities like Chrono Boost are used, and when early harassing, prodding, and scouting occurs.

Since you do not have control of the camera when watching a shoutcast, you cannot accurately replicate a build order by simply watching a shoutcast. As an experiment, I watched a shoutcast of a PvT where the Protoss player performed a very powerful 2-base timing attack on the Terran player. I then tried to replicate the build that I had just watched in a game and compared it to the original video.

In my version of the attack, at about the 11:30 mark, I was ready to go with a moderate-sized army of 120 supply with 2/2 weapon and armor upgrades. When I tried to execute this build in-game, it did not work very well against a similarly-skilled Terran player. When I went back and watched the video, the pro's timing attack was with 0/0 weapon and armor upgrades, at 70 supply, but at the 8:15 mark. The pro's build was so effective because it hit the Terran player before they were able to get out Medivacs or Siege Tanks.

I got confused as the pro player did eventually throw down a double Forge and upgrade their weapons and armor, but this was a transition out of the timing attack, not something that occurred before the timing attack. When you just casually watch a Shoutcast, these details are easily mixed up. You need to get ahold of the actual replay file when possible so you can copy down the build second-by-second.

Note: This particular timing attack does not work anymore, so do not try it in an actual game – this is just an example. With the release of Heart of the Swarm, Terran players now have Widow Mines, so any timing attack around this time period requires an Observer or Oracle.

Drills for Watching Starcraft 2 Replays

Simply watching replays and shoutcasts is not enough to become a great Starcraft 2 player. Browse through the youtube comments on popular shoutcasts and you will see that most of the players that actually watch the videos are not highly ranked Starcraft 2 players.

The question becomes: why do some players get better at Starcraft 2 from watching replays and shoutcasts, whereas others spend a lot of time watching replays and shoutcasts but never actually get any better at Starcraft 2? The difference between the two groups of players is that players who get better after watching replays and shoutcasts are actively watching the games whereas the groups of players who do not get any better are passively watching the games.

Practice Drill #1 – Micro Mastery - Imagining You Are the Pro

One of the most effective ways to get better at Starcraft 2 is to mentally play the game as you are watching the replay or shoutcast. This is particularly good for improving your skill level when microing your units. This was alluded to in the section on mental maps and language. As you are watching a game unfold, you should pick 1 player (whichever player is playing your primary race) to follow. As you watch the replay, you should mentally mimic the micro you see in-game. You should imagine yourself controlling the units as if you were the pro you are watching.

This needs to occur in real time. Imagine you are watching a professional Protoss player make an early push with Gateway units. What you are **not** doing is saying the commands in your head. When watching Force Fields drop, you do not say “hold shift, press F, and then click”. Your brain already knows this if you have good mental maps and a rich mental language for Starcraft 2 already. This process is fast – it is not something you are saying to yourself outloud. Words are too slow to describe proper emulation.

What you should be doing is that when the pro goes to place the Force Fields, you should be pre-emptively envisioning where the Force Fields are going to go, how many they are, and what effect this will have. When the pro drops their force fields, you will get immediate feedback on how this placement worked out better than what you had imagined. You will then be able to compare the pro’s Force Field placement to your own mental placement. If there was a big difference, you can then question who had the better placement and why.

As you see good micro performed in-game by pro players and imagine yourself performing it, you will learn how to control your units like the pros with shocking speed. Remember too that recalling long-term memories is easier the fresher those memories are. As a result, after you have fresh memories of a pro’s great micro from watching a replay, it is very helpful to then play a ladder game in this primed state. This will help cement the improvements you just made in controlling your units from emulating a pro-level player.

Practice Drill #2 – Tactics Analysis - Who is Ahead?

One of most powerful exercises you can perform when watching a replay or shoutcast is to ask yourself a simple question: who is ahead? In other words, which player is “winning” right now? Who has the advantage? More importantly, why is that player ahead? How did they get there? What makes their situation so advantageous?

At first, you may not be very accurate with deciding who is ahead in a game. If you are having trouble with this concept, a good way to think about it is to ask yourself which player’s situation you would rather be in if you were playing in the match (ignore race).

When you decide who is ahead, you need to justify why. This is often subjective. One player might be ahead in economy or technology, whereas the other player may have inflicted more damage. Typically, the player who is ahead in economy is always ahead in the game. For example, I played in a Protoss vs Protoss recently where I took a fast expansion and my enemy went for a 1-base air harass build. While he was able to kill some of my workers with his attack, he took his expansion very late in the process. Even though he killed some of my units and workers and I did not kill any of his air units (simply chased them away), I was well ahead in the game, as my expansion was up much earlier and as a result I had 10 more workers than him by the time his attack was thwarted (as well as more production facilities).

A good time to ask yourself this question is after each engagement between the two enemy players. Each time damage is dealt from one player to another, whether it be a direct engagement or a harass, you will want to see who came out ahead from that attack. Sometimes the game can be very close and no one is definitely ahead or behind the other player.

This drill is great it allows you to judge the effectiveness of enemy attacks and strategies. By objectively evaluating who is ahead, you can get an idea of which attacks were effective, which ones were not, and why. This will allow you to make better strategy decisions in your own games.

Practice Drill #3 – Strategy Mastery - What Should the Pro Do?

Another great drill when watching replays is to periodically pause the game and imagine what the professional player might do next. You can pause the game before a major battle and imagine how one player might engage the enemy’s army to inflict maximal damage, or even note good times for the player to perform a drop attack or other form of harassment.

Once you guess what the professional player is going to do next, play the game and watch the action unfold. You can then analyze what the pro did versus what you recommended via the following:

- If your prediction and the pro’s action were the same, and it worked out well for the pro, you can confirm you made a good prediction.

- If your prediction and the pro's action were the same, but it worked out poorly for the pro, you should try to figure out where things went wrong and how the pro (and yourself) got trapped in a losing situation.
- If your prediction and the pro's action were different, and things worked out well for the pro, your proposed strategy was likely not very good. Ask yourself.. what signals did the pro have in order to make this good decision? How can I identify these cues in-game?
- If your prediction and the pro's action were different, and things went poorly for the pro, congratulations – you likely came up with a better strategy than a professional player!

This can also be used in conjunction with the “who is ahead” strategy. After an engagement, you can pause the game, ask yourself who is ahead, and why. The “who is ahead” question is great for predicting what a professional player should do next. If one player is slightly ahead of their opponent, a popular strategy might be to take an expansion. If one player is very far ahead of their opponent, they might try to end the game right there.

Remember that Pros Are Not Perfect

When performing these drills and asking these questions, I know a lot of you are thinking that you are incapable of critiquing a professional player's performance. After all, there is a reason that the player you are watching is a professional and you are still mucking around in the gold league (or wherever you are ranked).

However, this is far from the truth. Professional players make mistakes all the time, and even players ranked in the lower leagues can point out their mistakes. There are 3 primary reasons why this is the case. First off, as anyone who has played a few games of ladder knows, things move quickly and at a high intensity. It is easy to analyze strategy when you are in the calm position of the observer; it is a lot harder to do when you are trying to macro up and control your army at the same time (this is why mastering builds is so important). Secondly, as an observer watching a replay, you get to see what the other player is doing at all times. The professional player does not have this luxury, and as a result is going to be incapable of making decisions with 100% accuracy.

Also, understand that Starcraft 2 is still relatively new. It is widely established that 10,000 hours (or more) of hard, deliberate practice is what is required to be truly elite at any task. This is a lot of time invested. Even if you played Starcraft 2 for 8 hours a day, 365 days a year, it would take 3.5 years to rack up the 10,000 hours you would need to be a true expert. Given that even most pros do not get this much Starcraft 2 playing time a day, let alone every single day of the year with no breaks for every day since the release of Starcraft 2, even “pro” players will not be truly elite at Starcraft 2. As a result, they will make the same sorts of mistakes that regular players make (just much less frequently)!

It is likely that at the time of this writing, no one in the world has racked up this much practice time, especially outside of Korea. Realize that these 10,000 hours refer to hard, deliberate practice. Many pros

play 8-12 hours of Starcraft 2 a day, but much of it is team games, helping teammates practice, and otherwise messing around. This is not the same as the hard, deliberate practice of drilling build orders, playing ladder, reviewing personal wins and losses of replays, and analyzing the replays and games of other pros and previous champions.

Questions to Ask When Watching Pro Level Replays or Shoutcasts

In addition to these 3 drills, you should constantly be asking yourself the following questions when you watch a pro-level replay or shoutcast. Answering these questions makes yourself pay attention to and deeply analyze the game you are watching, resulting in significantly increased learning rates. At first, you may actually have to read these questions off before watching a game. However, with a little bit of practice, these questions will be asked automatically by the inquisitive brain that is actively watching the replay or shoutcast.

Here is a list of the questions (bold) and their explanations:

Questions to Ask Throughout the Game

- **Who is ahead?** Asking this question is such a valuable experience, it is listed as drill #2 and explained in the previous section.
- **What is each player vulnerable to right now?** If you were the enemy of either player, what units or buildings would you make to counter their build? This may not simply be units but also could be strategies or buildings. For example, imagine you are watching a Protoss versus Terran match where the Terran player has turtled on two bases with a lot of Siege Tanks and Vikings. The Protoss may not be able to break this turtle early in the game, and instead the vulnerability of the Terran player could be a double expansion by the Protoss player.
- **What would happen if one enemy engaged another at this moment?** In particular, can one player end the game with an attack right now? Does one player have a tech or army size advantage that they can exploit? What is the likelihood of each player's success in such an attack?
- **Would it be possible for either player to safely expand at this point in the game? When do the players take their expansions?** One of the biggest differences between players in the lower leagues and those in the top leagues is the ability of the latter group to take a 3rd, 4th, and even 5th base. Players in lower leagues rarely get beyond 2 actively mining bases. This is a good question to ask yourself to help you get a feel for when you should be taking additional bases in Starcraft 2.
- **Has One Player Already Won?** This question is similar to the "who is ahead" exercise, but with a twist. If you think one player is so far ahead that they have without a doubt won, call it mentally when you see it. Most of the time when you have a good idea which player is going to win, that

is the player that wins. However, this exercise is particularly insightful when you think one player has already won and then they go on to lose the game. This lets you see where they went wrong, how they failed to take advantage of their huge lead, and more importantly highlights the strategies that allowed the player who was really far behind to come back and win the game.

Questions to Ask Before an Engagement

- **Who has the advantage in the battle?** To answer this question, you will need to ask a few more questions. How many resources are tied up in each army? How many supplies is the size of each army? How technologically advanced is each army? What are the upgrades for each army? This is a drill that will help you size up the strength of each army. Getting good at this practice helps you quickly size up the strength of your army versus that of your enemy's when you get in an actual game. This will help prevent you from making ill-advised attacks as well as increases your ability to know when to push an advantage and when you would be advised to retreat.
- **Who stands to benefit the most from an engagement?** This is a function of not just who has the superior army, but also how many resources are invested in each army, how many resources each player has banked, and how easily the players can remacro their forces. Imagine a situation in a Protoss vs Zerg where the Protoss army is slightly superior (due to Zerg supply invested in non-combat Queens), but the Zerg player has 40 Larva waiting and a huge resource pool banked up. Even if the Zerg loses the initial exchange with the superior Protoss force, if the Zerg player can inflict enough damage and re-make their lost units in one production cycle, the Zerg player may actually take the lead and have an army advantage. It takes the Protoss more resources and time to re-make lost units, so sometimes the player with the inferior force stands to benefit the most from an engagement. This question will help you decide when it is time to attack your opponent. Whenever you stand to benefit the most from an engagement, it is a good time to attack. When you have the superior force but do not stand to benefit much from an engagement, taking map control and expanding is a good idea.
- **How would you control the units in the battle?** If one of the players is your main race, envision yourself controlling his units. How would you control the units to ensure victory? What is your combat priority? Would you advise fleeing at any point? If so, when? If the pro you are watching retreated from battle, did they make a good choice, or could they have inflicted efficient damage by staying in the fight? This practice helps improve your ability to micro your units and control your spellcasters during major engagements. Mentally rehearsing how to drop Force Fields, EMPs, Feedbacks, Psionic Storms, and Fungal Growths is a great way to improve your skill with these spellcasters when you actually get into the game.
- **What other factors may influence the outcome of the battle?** Can one player take advantage of the terrain or map layout to increase their chances of success in the battle? Is there room to kite or escape from the enemy player? This question trains you to look for advantages you can gain

by using the terrain to your favor as well as teaches you how to avoid disastrous encounters where the terrain causes you to lose your advantage. A popular strategy you might see here is for one player with a primarily ranged army to kite backwards when things start going poorly and head towards a choke point on the map. Once getting through the choke, the player turns their army around to engage melee and shorter-ranged units. If the chasing army confronts the ranged army in the choke point, the chasing army will suffer great losses.

Questions to Ask at the End of a Battle/Engagement

- **Who is Ahead?** The player that is ahead in a game changes frequently after an engagement. This was discussed thoroughly a few pages back.
- **Who benefitted the most from that battle?** Which player gained an advantage from the engagement you just witnessed? This is not necessarily the same as the question of which player is ahead. If one player is far behind in a game, and has a small victory, they could still be behind in a game, just less behind than before! If the answer to the question of who benefitted the most from the battle differs from who you thought stood to benefit the most from an engagement, why did this discrepancy occur? How did the player who benefitted the most from the battle overcome their disadvantageous position?
- **What could the losing player have done differently to change the outcome of the fight?** This is a simple yet effective strategy. How did the player that lost the engagement mess up? What should they have done differently? Even pros make a lot of mistakes, and watching and identifying these can help prevent you from making those same mistakes in your own games.
- **What could the winning player have done differently to increase their advantage?** Sometimes the winner of a fight, despite winning, could have done things even better. Did the player let too many enemy units get escape? How could they have stopped these units from fleeing? Were their terrain advantages the winning player did not see, spellcasts that were missed, or units he could have saved? This practice will increase your efficiency in battle. When you win a battle, you want to inflict as much damage as possible while minimizing your own losses. Otherwise, you may find yourself winning a lot of engagements without actually increasing your advantage in a game.
- **Should the losing player have backed out sooner? Did they lose extra units due to refusing to retreat?** This practice helps players figure out the best time to pull out of battle. There is nothing wrong with retreating from a battle, particularly if it is a losing situation. Retreating is advantageous in a variety of situations: you could have misjudged the size of your enemy's army before engaging, gotten surprised in a bad position, or just got out-microed by your enemy in a fight. However, just because you lose an engagement does not mean you need to lose a game. Games are lost when you lose your entire army, but you can still get back into a game after losing an engagement if you can salvage some of your army. When watching an engagement, you want to make a mental note of when one side has clearly lost. At this point, it is usually best

to pull out. Did the pro player pull out at this point, or did they stay in too long and lose extra units? If they retreated early, did they make a good decision? Was this an early withdrawal? Another thing to consider was whether or not their retreat was actually successful. Did they save some of their units? How did they go about doing this? These tactics are things you are going to want to know and use in your own games, as there will inevitably be situations where a retreat can prevent a poor engagement from turning into a loss.

- **How did terrain and map layout influence the battle?** This is another drill to help you identify ways that pro players use the terrain and map layout to their advantage in battle. Identifying the way pro players use terrain to their advantage can help you take advantage of the terrain in your own games.

Questions to Ask at the End of a Game

- **What were the most important aspects of the winner's strategy? In other words, when did the build their largest lead?** Reflecting on how a player won a game is a great way to see the various ways players can win games. Sometimes a player just out-expands an opponent and powers their way to a win. More often, they do this while limiting the number of enemy expansions. Sometimes a crippling drop or harass attack is enough to win a game. Sometimes just having better micro in an army vs army engagement is enough to win. There are a large number of ways players can win games, and this practice helps you identify methods to win games. As you see more and more ways that players end up winning games, you will begin to see new openings and methods for closing out your own matches and locking up a win for yourself.
- **Where did the loser go wrong? What could they have done differently to win the game?** Identifying where the loser lost the game is essential if you want to prevent making these mistakes yourself. Note that sometimes the loser goes wrong by their lack of action rather than their ill-advised action. For example, imagine a mirror match up where one of the players goes for an expansion-first build whereas the other player did not. If the player that did not go for an early expansion does not attack the player that did early in the game to punish that player for expanding early, the player who did not expand early will likely lose the game for their lack of action at this juncture. The player that did not expand does not lose the game because their army was smaller than the enemy's 10 minutes into the game but rather they lost because they let the enemy's economy surpass their own in the early portion of the game.
- **What, if any, was the defining event where the match was decided?** You always want to identify the major blunders players make in a game and how those players ended up making those blunders so you can avoid these mistakes in your own games. Sometimes a major mistake does not decide the outcome of a match. One player might win a small but early engagement in the game. The player with a small lead might then have a successful, but not crippling, drop or harass attack. They could repeat this a few times, slowly increasing their lead with each successive attack. This could ultimately lead to a large enough advantage for the harassing player to win the game.

- **Was the game a build order loss?** Another important thing to identify is whether or not the player that lost the game lost on a “build order loss”. This is when the loser starts with an opener that is significantly weak against the winner’s opener. This can result in a very early loss. These are important to identify because you want to make sure you never use builds that are susceptible to these build order losses. One of the common ways to lose in this fashion is by going with expansion-first builds. Players like to use these because if the enemy does not discover it, which they often do not, the fast-expanding player gets an advantage. However, on the few occasions where your enemy goes for a 1-base timing attack, you can lose the game on a “build order loss”. It is best to avoid these builds that are susceptible to build order losses and instead sticking to safer openers and learning the best ways to get back into a game where the enemy has fast expanded. You never want to lose a game that you never had a chance to win because of a build order loss.

Non-Main Race Replays

Given that there are 3 races and 9 possible match-ups, many of the best replays and shoutcasts may not feature a player that is playing your main race. These replays are still valuable, as you can still ask yourself these practice questions.

While you will want to watch replays of your own race to enhance your own microing capabilities, watching replays that feature other races can still increase your overall knowledge of Starcraft 2. Even if your preferred race is not featured, you can still ask yourself the questions listed in the previous section to help improve your Starcraft 2 skill level.

Many strategies work for all the races. Drops, harassment, transitions, making expansions, engaging with the enemy, fleeing from the enemy, flank attacks, and using the terrain are strategies that resonate with players of all races. Even if your main race is not being featured in a replay or shoutcast, replays can still be beneficial for players to watch and learn from.

The only caveat is that when watching replays that do not feature your main race, you need to take extra diligence to ask yourself and objectively answer the questions in the previous section. It is easy to zone out when watching shoutcasts that do not feature your race, as the less you know about a match-up, the easier it is to become a passive observer of a game rather than an active observer. As stated previously, watching replays in a passive state will not significantly improve your gameplay. You need to be attentive and active when watching replays and shoutcasts if you want to improve your skill. The questions in the drills section are designed to make sure you are attentive and active when watching a game.

Watching Your Own Replays

After every game of Starcraft 2, you should always stop to watch your own replays. Getting feedback in this manner is essential if you want to get better at Starcraft 2 over time. As an example of how important feedback is, some researchers like to use bowling as an example. Imagine if a curtain came down after you rolled a bowling ball and prevented you from seeing how many pins were knocked down. How would you know how well you did? Would you ever be able to get better without seeing feedback? The answer is not really, at least not significantly better.

You might argue that you get instant feedback during a game: either you win or lose, or you win or lose a particular engagement. While this is true, the amount of feedback you get in a game pales in comparison to the amount of feedback you can pick up from watching the replay. Most importantly, the replay shows you what you can see as well as what your opponent can see. This is feedback you never get in-game. You can also use tools like the production tab, workers lost, units lost, and army tabs to more accurately compare armies.

Information aside, your brain is focusing on too many things at once during an actual game. Typically, you can only really remember 1 lesson from a game you just played if you do not watch the replay, and that is the game-deciding battle or engagement. When you do not watch the replay, you miss out on the little things that each player did to give themselves an advantageous position in a game. Sometimes these small things snowball into a win and the major battle at the end was inconsequential.

When to Watch Replays

You want to watch your replay after each game you play when possible, as this is when the game is freshest in your head. Remember that memory recall is easiest the more recently the event has been recalled. In other words, it is easiest to remember about a game you just played right after you played it, rather than if you were asked to recall details about a game that occurred a few hours or a few days ago.

Watching the replay right after the game is the best time, as getting feedback when the memory is fresh will significantly reduce the unknowns and allow you to focus on the things you did not see in the game. If you are watching a replay of your own that is not fresh in your memory, some of your attention will be dedicated to things you have already seen and paid attention to before. Your brain might be observing the units being trained and how each player is moving their troops and as a result miss out on small things like positioning and micro that your opponent took to gain an advantage in a fight.

To continue with the bowling example, imagine that the curtain came down to block your vision of what happened to the pins, but a camera recorded the action. If you watched the recorded video a few hours later after you were done bowling for the game, it would not be nearly as meaningful as if you could have seen the effects of your throw right after rolling the ball. The memory is no longer fresh so the feedback loses its strength.

Questions to Ask During Losses

As you are watching a game that you lost, there are a few primary questions you need to ask yourself throughout the game:

- **At any point in the game was I winning?** You would be surprised to note that in games you lose, there is frequently a time where at one point you were winning the game. Identify the positions in the game where you were ahead of your opponent.
- **If there was a point in the game where I was winning, how did I lose that lead?** If you were ever ahead at any point in a game, how did the opponent take the lead? Remember that what you failed to do just as often cause losses as poorly executed actions. For example, you can lose a game if you lose most of your army by attacking in a disadvantageous position, but you can also lose a game if you sit on your army in your base while your opponent takes an extra expansion. This will help you identify the situations where you are losing your lead and allow you to prevent those situations from occurring in the future.
- **At any point in the game could I have won with an attack?** You will be surprised to know that there are often several points in a losing game where you could have won with an all-in attack (or at least significantly increased the lead). This typically occurs when your opponent is more aggressive than you with expansions, technology, or infrastructure. By tying up these resources in the game early, the opponent has a weaker army than you might have. By the late game, the opponent's economy and technology becomes stronger than yours, and they eventually win the game. By recognizing periods of vulnerability in an opponent, you can better time your attacks. Recognize that you will find that a small force is often enough to put out serious pressure if your opponent is being very greedy with their expansions and technology.
- **How was my building placement? Were my buildings placed in the optimal locations?** Another thing you want to examine after a loss was your building placement. Sometimes poor building placement can cost you the game. If you lost to a Zergling run-by, you might examine how you could have placed your buildings to prevent this from happening.
- **What was the composition of each player's armies?** Did army composition cause your loss in this game? What would work better against your enemy's composition? You may start to notice trends about what enemy army compositions you lose too, and recognizing this will help you put together better armies.
- **What is one thing I have done differently to prevent that loss?** The most powerful question is to ultimately decide what you could have done differently to win the game. The answer to this question varies from game to game, so honestly understanding why you lost a game is important. The answer is never that the enemy's race or strategy is overpowered. If you lost because your build order was weak against your enemy's build order, you should try to figure out better ways you could have scouted the enemy's build as well as changes you could make to your own build that would prevent these types of losses.

Questions to Ask During Wins

A big mistake players make is only watching replays where they lost the game. Watching winning replays is important too as these also contain various bits of information. Players rarely win games with a flawless performance, so you can still find ways that you could have performed better. You can also objectively evaluate the value of your engagements and strategies in-game by taking a second look.

- **How effective were my attacks?** While your overall strategy may have been effective, you want to objectively evaluate each time you attacked the player. Each time you harassed an enemy for example, you want to figure out whether or not it was worth it. It may feel like you did a lot of damage to the enemy, but if you lost more than the enemy did, it may not have been worth it. Conversely, it may not feel like you made the most out of a harass, but if it flustered your enemy, it may have been a good attack. Using the Units Lost tab and Workers Lost screen (brought up via CTRT+R while watching the replay) can help make this clearer.
- **Could I have ended the game earlier?** The longer a game goes on, the more chances you give the opponent to get back into a game. If there was a point in a game that you won where you had an overwhelming advantage but did not end the game, where was it? How can you end games sooner in the future? Oftentimes, if you have a player that is turtled, you might pull back and build up a large army. Sometimes this is a good decision, but sometimes you could have ended the game earlier by not attacking directly. If you were a Protoss player in a Protoss vs Terran and the Terran has heavily fortified their natural, perhaps you could skip this position and attack in the main with Blink Stalkers and Warp Prisms.
- **Was there a time I could have expanded sooner?** Sometimes, you have an advantage, but not a big enough advantage that you think you could have ended the game. In these situations, you can expand your lead by taking an additional expansion. Typically, there is always a time where you could have safely expanded sooner, but either forgot or did not realize that the enemy was in no position to attack you due to a lack of information. This question will help you take your expansions sooner, improving your macro.
- **What are 3 things that I could have done better?** This is a broad question, and something that can be answered in a variety of ways. There are often hundreds of things you could have done better in a game of Starcraft 2, even in a win. For this reason, it is best to narrow it down to just three things you could have done better. If it was a short game that you won with early aggression, perhaps this could have just been microing your units better or spending built up minerals sooner. In a late game, it could be things you did poorly, such as enemy units you let escape that should not have, or things you did not do, such as expand sooner or scout better.

Note on Game Speed Settings

When watching your own replays (not professional ones), you should watch them at a faster speed, slowing down before major engagements. You do not want to spend 30 minutes watching a 30 minute

replay, as this is not an efficient use of your time. However, taking a few minutes after each game to review your mistakes can significantly improve your skill.

This can be done at a faster speed than the game was played, slowing it down before each major engagement. You do not want to spend 30 minutes watching a 30 minute replay as this is not an efficient use of your time. If replays took that long to watch you would likely be better off just chaining ladder games. Rather, you just want to take a few minutes to watch each replay. It should not be an all-day event. With that said, do not skip ahead so quickly that you do not have time to ask yourself the questions listed in the previous section. You want to cut down the time you spend watching your replays, but you also still want to be an active observer.

Note that this recommendation is not the case when watching pro replays and shoutcasts. You want to watch these at the normal in-game speed (“Faster”) so your brain can mimic the superior micro and controls of the pros. When you are watching yourself play though, you are not subconsciously picking up unit control, as you are watching what you already know unfold. As a result, watching pro replays at regular speed is much more useful than watching your own replays at regular speed.

Watching Shoutcasts, Pro Replays, and Your Own Replays – Summary

Before we jump into the next major section of the book, let’s review the major points discussed in this section on replays, as a lot of information was covered:

- Before you begin watching replays, you should have a clear understanding of all the hotkeys in Starcraft 2 for your race of choice. You should know the hotkeys and mouse controls required to cast each ability and perform each efficiency trick. Hotkeys and efficiency tricks (and how to master them) were covered in a previous section of the book.
- Watching pro replays is a great way to improve your own micro. Once you know the controls for your main race, you will subconsciously emulate what you are seeing thanks to mirror neurons. Your brain will be thinking, “oh, so that’s how they do it!” when you see how pros control their units and spellcasters in battle. This will directly correlate to improved control of your own units in battle. Watch these replays at regular speed as mirror neurons will not be effective at mimicking what the brain sees if what it is watching is happening at an abnormally fast rate.
- Watching shoutcasts is a great way to increase your Starcraft 2 vocabulary. Shoutcasts are games of Starcraft 2 that are being announced by one or more commentators. Only watch top-tier players, do not watch shoutcasts of low-ranked players. Simple words like “4-Gate” and “timing attack” are chunks of information that represent large concepts without taking up much space in the brain. Having a large number of these chunks of information will significantly improve your Starcraft 2 ability as it allows you to mentally manipulate large amounts of information. A list of good, free youtube channels for shoutcasts is listed in the previous section.

- Watching your own replays is a great way to prevent making the same mistakes in multiple games as well as for identifying areas where you could be more efficient. Do not watch your own replays at regular speed, as this takes up too much time. Watching your own micro in real time will not improve your micro, as there is nothing new for your mirror neurons to watch. Instead, watch the game at a faster speed and identify what you did wrong and what you could have done better. This is the most efficient use of your time.
- To gain the most out of watching replays of all types, you need to be an active observer rather than a passive one. Three drills you should practice as well as a list of questions to ask yourself when watching replays can be found in the previous section. Performing these exercises and asking yourself the questions listed in the previous section when watching replays will make you an active observer.

Once you learn a few builds and know all the hotkeys, the most important thing you can do to improve your skill (in addition to regularly playing ladder games) is to actively watch replays. Do not ignore this aspect of Starcraft 2, as you can be sure your opponents are watching replays and benefitting from them!

Match and Race-Specific Strategies

Mastery of Starcraft 2 in accordance with the pyramid posted at the beginning of this book involves four things: build orders, hotkeys & settings, replays, and finally match & race-specific strategies. We have covered the first 3 blocks of the pyramid in previous sections of the book. Now, we will focus on the top of the period – and the least important – match and race-specific strategies.

To clarify something, by **match strategies** I am referring to specific tactics for use in specific match-ups, such as Protoss vs Protoss or Terran vs Zerg. Beyond the opener and basic build, there are many tricks and strategies that are used by players in these particular match-ups. This also includes things like builds, transitions, timing of expansions, and so on. An example of a match strategy would kiting Banelings with Marines back to Widow Mines.

By **race strategies**, I am referring to strategies used by a specific race that can be used in any match-up by players of that race. An example of a race strategy would be Protoss players using the Sentry's Hallucinate ability to create hallucinated Phoenix, which can then be used to quickly scout the map. I recommend learning the "race strategies" first, as discussed below.

You may be surprised that I rate what most people consider to be the bulk of learning about Starcraft 2 – that is strategy in general – to be the least important aspect of Starcraft 2 mastery. Allow me to explain, as there are a lot of reasons I rate strategy, both general race strategies and specific match-up, as the least important aspect of Starcraft 2 (at least when it comes to practice).

Match-Specific Strategies Are Temporary, Race Strategies Last Awhile and Hotkeys Are Forever

The biggest reason why investing a lot of time into learning specific match-ups is that these bits of information and tactics are often fleeting. For example, if you dedicated a ton of time to learning all about the Protoss vs Terran match-up in Wings of Liberty, you will be disappointed to find that this match-up changes with the release of Heart of the Swarm. Many of the tips and strategies you will have read and learned about this match-up are now obsolete. If you invested a lot of time into learning these now obsolete tactics and are not already a master at controlling your units and using hotkeys, then you just wasted a lot of time!

Another thing that changes what the ideal strategies are in race match-ups is the map pool. Each ladder season, new maps are introduced and old ones are removed. As certain maps favor certain strategies in each race match-up, strategies come and go each time the ladder map pool changes. An example of this is that at the time of this writing, most new maps are much bigger than the older ladder maps. This has made players in all match-ups go for a more economic focus. If you learned a lot of specific strategies and tips that relied on smaller maps to be viable, you would have then lost a lot of time.

Patches can also make many unit combinations and strategies obsolete. For example, Terran players spent a lot of time learning to use the Reaper in Zerg matches early on in Wings of Liberty, but due to a nerf to the Reaper and a buff to Roach range, these units fell completely out of favor in the Terran vs Zerg match-up. Then, with Heart of the Swarm, a Reaper change has made Reapers a viable opener in Terran vs Zerg once again.

It is also interesting to note that there does not even need to be an expansion, patch, or new maps to make certain match-specific strategies obsolete. For example, in Zerg vs Zerg, going for a very early expansion was seen as being very risky versus Zergling/Baneling all-in attacks. However, players finally discovered that with a few extra Queens and a Baneling nest at around 28 supply, they could fend off even the best-timed Zergling/Baneling all-in attacks. As this build spread, it has completely redefined the way many Zerg vs Zerg games play out. This shifting of strategies over time is known as the **meta game**.

Match-Up and Race-Specific Strategies Are Low Pay Off

I hear what you are saying – how are builds any different from strategies in this regard? If we dedicate a lot of time to learning builds, and a patch or meta-game shift changes the viability of a build, did we not just waste time learning the build only to have to learn a new one?

The answer is that one reason mastering builds allows you to get much better at Starcraft 2 is because it lowers the amount of things you have to think about and makes player more comfortable when playing games. Reducing game-related anxiety and the number of things you have to think about will increase performance and learning.

Are Strategies Useless?

Do not confuse what I am saying – learning the strategies is indeed useful. However, you get the least return for your time invested when studying these sorts of strategies. Make sure you have a few good builds and all of your hotkeys & controls down could as a first priority. Spend an hour a day playing games and watching your own replays. Watch pro replays and shoutcasts to boost your knowledge. If you are already doing all this, still have more time to dedicate towards practice, and want to increase your skill level, only then should you concern yourself with specific strategies.

Reading the strategies in this section is really good if you want to make a “push” for a high rank. While the vast majority of players cannot dedicate more than 10-15 hours to Starcraft 2 a week (nor do they want to), there may come a time in your life when you want to “push” for a really high ranking, where you binge on Starcraft 2 for a week to a few months. In these cases, learning the meta game and specific strategies and tips can be very beneficial.

Protoss Strategies & Match Ups

In this section, we will discuss general Protoss strategies you can use against all opponents and then break down each of the specific Protoss match-ups. While Protoss units are widely considered among the most powerful, they are also very expensive.

General Protoss Strategies

The following strategies can be used in all Protoss match-ups.

Hallucinated Phoenix

One of the easiest ways to get scouting information in the early game without risking any of your units is to use the Sentry's "Hallucinate" ability to create a Phoenix. This Phoenix can then be used to scout all over the map. You can create multiple Phoenix as well, which can be used to check for enemy proxy buildings or hidden expansions.

Chrono Boost

Pro-level players versus the average player use their Chrono Boost in very different ways. Chrono Boost is one of the major perks of being a Protoss player, so if you are not using your boosts regularly, you will be at an automatic disadvantage.

I think most players recognize that Chrono Boost can be used on the Nexus to speed up Probe production. However, make sure you have enough supply cap space to handle increased Probe production before actually using Chrono Boost. In Gold and lower games, you constantly see players use Chrono Boost on the Nexus at the start of the game before the player actually has started a Pylon. The result is that the Protoss player goes up to 10/10 supplies and their Chrono Boost's increased Probe production rate is wasted until the first Pylon finishes. Always wait until you get your first Pylon down before Chrono Boosting Probes.

While most players know to do this, many players do not use their Chrono Boost efficiently later in the game. It is a combination of not knowing how Chrono Boost can be used as well as simply forgetting to do it. If you have a lot of Chrono Boost energy saved up, remember that it can be used on any building that trains units or researches upgrades. A good way to spend up extra Nexus energy is to use Chrono Boost on your Forges to speed up your weapon and armor upgrades.

Many players in the lower leagues also do not realize that Chrono Boost works on Warpgates – a Chrono Boosted Warpgate's Warp In cooldown will be decreased by 50%. If you warp in a Zealot at a Warpgate,

the cooldown on being able to warp in another unit would be 28 seconds. If the Warpgate was Chrono Boosted, the cooldown would tick 50% faster, resulting in the next unit being able to be warped in in just under 19 seconds.

If you already know this, it is just a simple reminder, as many players in the lower leagues do not realize this. I know this is basic information but it is worth adding in here once just in case a player does not realize they can use Chrono Boost in this fashion.

Always Get Warpgates

One newbie mistake for Protoss players is not getting Warpgate technology out right away because they believe it requires more macro to warp in units than it does to train them. Obviously this is a big mistake.

Even if the significant advantage of being able to warp in units anywhere near a Pylon or Warp Prism that these units are available almost instantly did not exist, Warpgate would still be worth getting! The reason is that the cooldown on warping in units is significantly faster than just training the units. For example, it takes 38 seconds to train a Zealot from a Gateway, but the cooldown for warping in Zealots is only 28 seconds. Zealots, Stalkers, High Templar, and Dark Templar all have 10 seconds taken off their production time with Warp Gate, whereas Sentries have 5 seconds taken off this time.

Choosing a Nexus Location for a Fast Third Base

When taking a third base as Protoss, you do not necessarily always want to pick your “natural third”. The natural third base would be closest expansion by ground to your main base (aside from the natural expansion).

An alternative to taking your natural third is to take the closest expansion by air to your natural expansion. On some maps, this is the natural third base, on other maps, it is the fourth base. The reason you might want build your third Nexus at the fourth base if it is closer to the natural expansion by air is because it allows a single Mothership Core to easily defend both expansions. The Mothership Core can sit in the space between the third Nexus and the natural expansion. If either expansion is attacked or dropped, it can quickly move into position to use Photon Overcharge.

This strategy works best when you are taking a very fast third base. If you are not taking your third base until late in the game, you may want to grab the closest base by ground. By this point the opponent’s army is likely to be large enough that you will not be able to deflect attack with a Photon Overcharge alone and will want to be able to move your army quickly between your bases in order to defend them.

Time Warp on the Mineral Line

Many Protoss players enjoy using their Mothership Core to harass their enemy in the early stages of the game. This is a very effective strategy, particularly at the lower levels where your opponent's micro may make them particularly susceptible to being harassed.

No matter what your opponent's skill level is like, one good strategy for using the Mothership Core is to use Time Warp on the enemy's mineral line. This does not slow down mining rates, but it does slow down the speed that the enemy's harvesters travel to and return from the mineral patch to their town hall. This can reduce the income of a worker by about 25% for the duration of the ability, which is 30 seconds. Given that a single Time Warp can hit about 10 workers at once and lasts about 30 seconds with the fact that in an unsaturated mineral field (i.e. 16 workers or less), each worker harvests about 1 mineral per second, this can take away 60-100 minerals from the enemy. While this is not a huge amount and this loss will not be fully realized if the enemy player mines out their base, it does actually matter in the early game. It really compounds if you can pick off a few workers on top of slowing down the harvesting. It is easier for the Mothership Core to attack and kill workers afflicted by Time Warp as well, which is an added bonus.

This is most effective when the enemy has 16 workers or less, as if the mineral saturation is higher than the worker's movement speed will not matter much.

Be sure to do this only when you have map control and are not going to need the Mothership Core's energy for a Photon Overcharge. The last thing you want to do is use Time Warp on the enemy's mineral line only to lose the game to an early timing attack where you did not have enough energy to use Photon Overcharge!

Using Photon Overcharge to Defend your Expansions & Trapping Your Enemies

Early in the game, Photon Overcharge is a great way to protect your natural expansion from any early aggression. Against incursions before the approximately 8 minute mark, there is literally no ground army that is going to be able to take down a Nexus that has Photon Overcharge running without major damages. Make sure you save your Mothership Core energy for this purpose, as it does require 100 energy. If you use Time Warp or Mass Recall early in the game, you lose the ability to use Photon Overcharge until you get enough energy again.

One excellent strategy that can turn an enemy's timing attack on its head is to use Force Field to trap enemy units within range of Photon Overcharge. The enemy might think they are slick by finding your expansion "undefended" at which point you use Photon Overcharge on the Nexus. At this point, the typical response of your opponent will be to pull out, make another wave of reinforcements, and wait for Photon Overcharge to wear off.

If you have some Sentry energy, right after using Photon Overcharge, you can use Force Fields to prevent this escape from happening. By trapping enemy units within range of Force Field, you have plenty of time to destroy their forces and there is not much they can do about it. This stops a timing attack with ease even if you have a smaller army than your enemy. You then can counter attack or head into the mid-game with a sizeable lead (they are likely just on one base if it is that early attack).

Protoss vs Protoss

The Protoss vs Protoss match-up, like all mirror match-ups, typically demands a conservative opening. Players are vulnerable to both early Gateway aggression, early timing attacks, and Dark Templar rushes. Detection and a tight base layout before expanding can help with all of these scenarios.

Proxy Pylons

A proxy Pylon is a Pylon placed in a forward position that players use to warp units to the front line. In Protoss versus Protoss, you should regularly scout with a Probe starting at the 4:00 mark. If you see a proxy Pylon that early in the game, you are likely in for aggression from your opponent. You will want to kill this as soon as you can.

Throughout the match, regularly check for proxy Pylons near your base. Killing these regularly will really hinder your opponent's ability to launch offensive attacks.

Early Game Scouting

Hide a Probe or two in random locations around the map so you can drop or scout for proxy Pylons. Hallucinated Phoenix can scout for Pylons as well once you get Sentries, as Hallucinated Phoenix can cover the entire map very quickly.

Attacking or Defending With Stalkers or Immortals against Zealot/Stalker

One of the most important skills you need to master as a Protoss player that drastically impacts your ability to win mirror match-ups is microing your Stalkers appropriately against Zealots. Many PvP games come down to one or both players attacking (or defending) in the early game with a combination of Stalkers and Zealots.

Stalkers are much faster than Zealots in the early game (i.e. no Charge) and can kite Zealots alone endlessly. They shoot, run away from the Zealot, then stop briefly to shoot again. You can repeat this

until all the Zealots have died without even getting in a single hit. As a result, you cannot use mass Zealots alone against Stalkers. Being able to micro against Zealots in this manner is your first task in being an effective Protoss player in mirror matchups.

Despite the Stalker's superiority to the Zealot, mixing in Zealots with your Stalkers can be a very powerful strategy. The reason for this is that Zealots are light units, so they do not take very much damage against a Stalker attack. Zealots also deal a lot of damage Stalkers, so Stalkers must take care to kite against them. Zealots are fast enough that the Stalker will have to spend more time moving than their actual attack's cooldown, so a Stalker that is kiting a Zealot will deal reduced DPS. The end result is that Stalkers running from Zealots take a long time to kill off the Zealot. Finally, Zealots are cheaper than Stalkers, so there is a numbers advantage that you can tap into as well.

This becomes relevant when the player with Zealots also has Stalkers. If player "A" is running from the Zealots of player "B", the Stalkers of player "A" will be taking damage full damage from the Stalkers of player "B". The Stalkers of player "B" will be able to kill off the Stalkers of player "A" before the Stalkers of player "A" can kill the Zealots of player "B", assuming supply counts are equal between the two armies. Given that Zealots train faster (and have a lower Warp Gate cooldown), only cost 100 minerals and Stalkers cost 125 minerals and 50 vespene gas, it is generally an advantage to add them in to your army, but not always. Your response to Zealot/Stalker depends on the location of the fight as well as your current resource count.

Zealots become much more effective when the battleground is inside either player's base. If the enemy's Stalkers are kiting your Zealots around a small area, such as the main base, they will have less uptime and less room to kite your Zealots, whether these Zealots are on offense or defense. In the open field however, you simply want mass Stalkers, and Zealots are not nearly as effective. As a result, if your opponent is trying to bust up your ramp and attack you on one base early in the game with Stalkers, add a bunch of Zealots to the mix. Get enough Stalkers to punish the enemy for running from your units. Even if your opponent masses Stalkers and you trade your own Zealots for their Stalkers you will begin saving enough gas and minerals with each engagement. Eventually you will be able to get up to Void Ray or Immortal, either one you can use to gain an advantage over your opponent.

In the open field, there is enough space to run away from the opponent's Zealots, stopping to shoot their Stalkers. If you have a Stalker advantage, you can consistently ignore their Zealots, pick off all the Stalkers, then kill the defenseless Zealots through good micro. You have to right click to specifically target the enemy's Stalkers with your own so they do not accidentally waste damage on the Zealots. You will not have enough space to do this in the main though so this is something that can only be easily performed in the open field.

When you add Immortals to the mix, you should specifically use them to focus fire down the enemy's Stalkers, ignoring the Zealots. Zealots take very little damage from Immortals. If you have an Immortal along with your Stalker/Zealot army and are going against an enemy Zealot/Stalker army, you cannot

afford to waste your Immortal by letting it attack Zealots. You need to manually attack Stalkers and micro it away from enemy Zealots when it begins taking too much damage.

If both players use equal amounts of Zealots, it can be hard to gain an advantage in Protoss versus Protoss. Many of the games come down to Stalker versus Stalker battles. In this situation, you need to be able to focus down the Stalkers preferentially and possibly even pull away weak Stalkers to the back so that they can regenerate shields and fight again.

The easiest way to learn this is to simply watch pro-level Protoss vs Protoss games. You will see the micro tricks they use in the early game and you can copy their strategies for yourself with some practice. If you are at least ranked in Platinum, have mastered a pro-level build, and still struggle in the early game in mirror match-ups, try to watch 1-2 pro-level Protoss vs Protoss match-ups each day. After you are done watching, play a few games, each time going for early Zealot and Stalker aggression. Your micro will improve.

Early Aggression on 1-2 Gateways

The Mothership Core makes early-game aggression in PvP match-ups more effective than ever. Previously, Protoss ground armies were very susceptible to being cut off with Force Fields by going up a ramp. Protoss players used to counter this by sending an exploratory Zealot or 3 up the ramp to give vision of the high ground and then using Stalkers on the low ground to pick off the Sentries before moving up the ramp.

Now, the Mothership Core can be used to spot the high ground. A Mothership Core can sit at the base of the ramp in a safe location, Time Warp can be used at the top of the ramp, and the Protoss on the offense can use their Stalkers on the low ground to attack units on the high ground. The Mothership Core is also very effective at picking off Sentries due to the Mothership Core's high HP total relative to the Sentry's. Without Stalkers, the Protoss player getting attacked by the Mothership Core will struggle to hold off this attack. At the very least, you can contain the Protoss player in their main and expand, then retreat (or Mass Recall home) once the contained player has enough units to break out. This will give you a nice economic lead.

This allows the Protoss player to go for 2 Gateway (and eventually Warp Gate) Stalker and Mothership Core opener to put out a lot of pressure without much infrastructure. Unlike the traditional 4-Gate, 2-Gate Stalker plus Mothership Core is hardly an all-in. Since the Protoss player is only investing into two Warp Gates to make the attack, you can easily transition into an expansion or tech into Stargate or Robotics Facility if you want to continue the pressure.

The primary advantage here is that the 2 Gate Stalker + Mothership Core combo is able to inflict serious damage on Sentry-heavy and fast-expand openers without the downsides of the 4-Gate. This opener allows you to pull out wins with regularity on any Protoss player who opts for a fast expansion without

pigeon-holing you into an all-in like the 4-Gate does. For example, if you open this way and your opponent goes for a 4-Gate, you can easily hold it off thanks to Photon Overcharge, allowing you to get down a Robotics Facility, building a few Immortals to break the contain, and finally expanding. This will come out of the 4-Gate defense slightly ahead in economy and notably far ahead in technology, putting you in a great position entering the mid-game.

Dark Templar Opener

Rushing to Dark Templar is one of the most popular and most effective openers in Protoss vs Protoss. The object is simple: get out a Dark Shrine as soon as possible, warp in a Dark Templar or two, and try to surprise the opponent before they get detection. If the opponent expanded early or massed Gateways, they will be in a lot of trouble. Even Stargate openers are vulnerable to a Dark Templar rush. While the Oracle can detect units, it also costs energy to use Envision, its detecting ability. Players often spend this energy on the Pulsar Beam and are stuck without detection for a bit when your Dark Templar shows up.

The best part about the Dark Templar opener is that even if it fails completely, you will not be far behind in the game. Dark Templar are a great unit to have, especially in the early game. Even if initial Dark Templar play fails, they can be used all game to warp into your opponent's base and harass their mineral line via Warp Prisms. Dark Templar 1-shot Probes, making them very fast at clearing out mineral lines. Use Hallucinated Phoenix to scout enemy positions to know when it is safe to go in with DTs. Most players will not leave an Observer in their base.

Warp in Dark Templar at the closest Pylon and then just run them into the enemy base. Works well once the Protoss takes a third base, as there is typically no wall-off in PvP and the 1 Observer players tend to keep in their base cannot be everywhere at once. This does not work if enemy has Photon Cannons in the mineral line.

Aside from using Dark Templar as a harassing unit, the other great thing about a Dark Templar opener is that if the enemy stops your Dark Templar, you can just convert those DTs into Archons. Archons are good against virtually all Protoss units. They are particularly good versus Zealots and Sentries. They have the added bonus of crushing Force Fields, being massive, and not being armored units. Crushing Force Fields helps because it prevents a Protoss enemy from walling off their ramp with Force Field to stall your attack. Being a Massive unit means that they cannot be affected by the Phoenix' Graviton Beam, which is a downfall of the Immortal in early game Protoss vs Protoss engagements. Finally, since they are not armored units, they take little damage against Stalkers, Immortals, and Void Rays.

The end result is that even if your Dark Templar are spotted right away, you can morph in 1-3 Archons, add in some Stalkers and Zealots and go for an all-in attack against a Protoss player relatively early in the game. If your numbers are vastly superior to the enemy Protoss, you can end the game with this push. Archons will bust down Force Fields so the enemy cannot stop you. Archons are also great versus Zealots and Probes, two of the desperation units often used to try to deflect a big early-game attack.

Another desperation move an enemy Protoss might try to do in order to stop your Archon push is to wall off their ramp with Pylons. **Do not try to run up a ramp that has been walled off with Pylons.** Instead, Hallucinate a Phoenix, get an Observer, or bring the Mothership Core along to provide vision of the high ground. Use your Stalkers to take out these Pylons from the safety of the low ground. Given that the enemy's units will be stuck behind these Pylons, they will not be able to hit your Stalkers while you take out the Pylons. Each Pylon you kill in this manner is 1 less Zealot for the enemy, so if the enemy keeps replacing the Pylons, keep taking them down. Do not run up the ramp with ground units when there are Pylons at the top as this could cost you your army. Take them down slow and gain an advantage in the process.

If you and your enemy's army are equal in size and the enemy has out a Mothership Core, you are not going to be able to end the game right away even with the Archon advantage. Even if your army composition is better, when the armies are small, Photon Overcharge is a massive advantage, so do not push your luck (and lose your army). Instead, keep the enemy contained while you take your own expansion. You may fall slightly behind in army initially while investing in a Nexus and extra Probes, so when your opponent decides to move out and break your contain, you can fall back to your new natural expansion. There, you will have the advantage of Photon Overcharge, so the opponent will not be able to attack. By taking your expansion a few minutes earlier, there will be a several minute window where you have a larger army that you can use to kill off the opponent's natural, all but winning the game outright.

Dark Templar Harass in the Late Game

In a Protoss vs Protoss match-up, Dark Templar are a great harassing unit in the late game. Most Protoss players do not get enough Observers out to cover their bases from Dark Templar assaults from multiple angles.

Just sending in a few Dark Templar to a single base does not always work, as your enemy typically will have a single Observer out on the field. Instead, this strategy becomes many times more effective the most bases you can hit at once.

Imagine the Protoss player has 4 total bases. You can send in 2-3 Dark Templar to each the third and the fourth at the same time. While your opponent is struggling with how to deal with these two attacks, you can load a few Dark Templar into a Warp Prism and drop them in the main base. If the main base looks ripe for the attack, you can then warp in a few Zealots there to aid the attack.

This is a devastatingly effective strategy and may win you the game outright if you can destroy the Robotics Facility before enough Observers can come out. If there is only one Observer on the map, it will take a very long time to get it from wherever it is to the third and fourth bases and then back to the main to clear up the multi-pronged Dark Templar attack.

Also, remember that a single Photon Cannon or two in the third or fourth base is not enough to stop this type of attack from working. Two Dark Templar can easily destroy a single Photon Cannon and then go on to destroy the expansion. Three Dark Templar can easily handle two Photon Cannons. The drop in the main can clear out even more Photon Cannons, particularly if you warp in Zealot reinforcements.

To make this strategy even more effective, position your main army outside of the opponent's third base. If the opponent pulls the bulk of their army back to their main base to deal with your drop, you can use your army to snipe the third base, its Probes, and any units that might have been left behind. This is a much more effective way of initiating an attack in Protoss vs Protoss in the late game than just allowing your two massed armies to meet up in an assault.

Stopping Dark Templar Openers

Stopping Dark Templar openers is not very difficult as long as your build is reasonable. First, never grab an expansion against an enemy Protoss player without scouting first. Dark Templar builds are so prevalent that you need to know what the enemy is up to before expanding. Even if you do not get rushed with Dark Templar, you run the risk of getting surprised by any sort of all-in one base attack which can be tough to stop if you expanded early in a mirror match!

If you do expand early, a Photon Cannon can work on some maps, but ideally you need Observer detection. A Photon Cannon or two at the door to natural expansion may stop a Dark Templar run but it is not going to help you if a few Void Rays show up and start nuking your main. If you expanded early plus invested in Photon Cannons, there's practically no way to stop a cheesy 1-base Void Ray rush. Void Rays own Stalkers in Heart of the Swarm. I would not recommend opening in such a way that leaves you so vulnerable to an easy to use build.

The only way you would want to use a Photon Cannon for detection in the early game is if you were racing for Dark Templar yourself. If your enemy goes for fast Void Rays, they are not going to have detection. Even if they Chrono Boost out an Oracle, that is okay, because you will stop mining and shut down Void Ray production in the meantime, allowing you to prepare an adequate defense against the Void Ray assault.

The Oracle's Envision ability can be used to turn it into a detector if you opened with Stargates. The only problem with this skill is that it costs energy and requires the Oracle to be on defense. This is rarely useable when you are surprised by a Dark Templar because your Oracle typically will be across the map currently on offense. Even if the Oracle was in position, you typically would have already spent your energy on Pulsar Beam. If you got caught completely offguard by the Dark Templar opener or opened with Stargate and are out of position, you can prevent a Dark Templar from entering your base with Force Field. If you scout a Dark Shrine, warp in a Sentry (or 3) and park them at the top of your ramp. Stare at the ramp while macroing towards an Observer, waiting for the blur to appear. As soon as the blur appears, drop a Force Field to close off your ramp. The Dark Templar will be unable to get into

your main. Refresh the Force Field until you have detection, allowing no downtime for the Dark Templar to slip into your base.

A strong opener for a Protoss player is getting out 2 Gateways and a Robotics Facility. Even if the enemy does not go for Dark Templar, you can make an attack with Stalkers, Zealots, and Immortals. The early Robotics Facility means you have early access to an Observer to stop Dark Templar. The only downside is that this build is slightly vulnerable in the early game to a Phoenix opener.

One way to get around this is to try to scout the Protoss player with a Hallucinated Phoenix. If you see a fast Twilight Council, you can prep for Dark Templar. If you see a Stargate, you know you might not want to open with Immortals due to their vulnerability to Phoenix attack.

Stopping Dark Templar Harass in the Mid-Late Game

As mentioned in the previous section, you can inflict major damage with Dark Templar harass even in the late-game of Protoss versus Protoss match-ups. The bad news is that you can also take major damage from Dark Templar harass if you do not defend against it properly. The good news is that there are steps you can take in order to stop this harassment technique from happening.

The most important aspect of stopping Dark Templar is to be prepared with Observers. If you see a Dark Shrine go up, you need to make a minimum of 1 Observer for your army and 1 additional Observer for each base you have. This means that if you have 3 expansions, you will want 1 Observer in your main, 1 in each of your 3 expansions, and 1 with your army (at a minimum), giving you 5 total Observers.

You must get out the Observer speed upgrade in order to handle aggressive Dark Templar play. Dark Templar can move significantly faster than an Observer until the Observer gets out Gravitic Boosters. It is not an expensive upgrade and researches quickly and is very useful. There is no reason not to grab it in all late PvP games, as it allows your Observers to keep up with your army when you are on offense as well. Otherwise, you will always be waiting for your Observers to catch up.

On your most satellite expansions, you will want to throw down a few Photon Cannons to buy some time to defend against Dark Templar and to provide detection. This can allow you to reinforce your bases with the Mothership Core's Mass Recall ability. While it may seem like a big investment to move the bulk of your army back to defend against a handful of Dark Templar, remember that Dark Templar are extremely expensive units, and by killing them, you can take a nice lead. Dark Templar cost 125 minerals and 125 gas a piece. If you can kill off 4 that are trying to snipe one of your bases, your enemy just lost 500 minerals and 500 gas worth of Dark Templar. This is a very big chunk and will quickly add up under your opponent's "units lost" tab.

With that said, you cannot rely solely on Photon Cannons to stop Dark Templar. You need Observers and regular units to help defend. If you start throwing down too many Photon Cannons at your satellite expansions, a smart Protoss enemy will see this and warp in a wave of Zealots. Zealots with 3/3

upgrades are very cost effective versus Photon Cannons. A good Protoss will use an initial wave of Zealots to clear out your cannons and then follow up with a wave of Dark Templar. If you rebuild the cannons, they will attack again with Zealots. Each time, they get ahead economically since 10 3/3 Zealots will beat 10 Photon Cannons and cost 500 minerals less in the process. Eventually, when you stop building cannons, Dark Templar will appear. You need an Observer there in order to scout the Dark Templar to prevent this cycle from happening.

Using Warp Prisms for Harass

Warping in Zealots into the enemy's mineral line is a great strategy in PvP. It works best in the main, since it takes a long time to get to for the retreating army to get there. Zealot decoy works well too, where you warp (or just run) a few Zealots into an expansion, once the enemy pulls out to defend it, engage with your main force at an opposite expansion. Your main army will either kill an expansion or fight a partial army, either way it is a big win for you at just the cost of a few Zealots.

Be careful when warping in Dark Templar with this strategy. As discussed elsewhere in this book, Dark Templar are expensive. If you warp in 4 Dark Templar and they end up getting killed, you just lost 500 minerals and 500 vespene gas. Using 4 Dark Templar to kill just 10-15 Probes is a big loss for you, as any player would gladly trade 10-15 Probes for 2 Archons in a close Protoss vs Protoss match! Now if you can use just a single Dark Templar to inflict that much damage, that is well worth it.

Ideally, only warp in 1-2 Dark Templar per base. You usually get the best results when attacking in several spots at once. For example, sending 1 Dark Templar to all 3 of your opponent's bases is much more effective than warping in 3 Dark Templar into just 1 base. If there are three locations under attack, that is 3 locations that will need detection. This goes for all opponents, not just Protoss.

Zealots on the other hand only cost minerals so they are much more expendable. You do not even need to distract the opponent – just warp them in (or run them in) boldly warp in 4 Zealots without a single distraction and you often still get your money's worth. A Zealot only needs to kill 2 Probes to be an effective trade mineral-wise – the lost mining time and distraction to the enemy is an added bonus. This really is emphasized once you get Charge and +3 Weapons. Assuming the Protoss enemy does not have +shields and +armor equal to your +weapons (usually Protoss ground weapons track ahead of shields in practically all games), your Zealots can 2-shot a Probe. With Charge, 4 Zealots clear a mineral line so fast, and the Probes cannot even easily flee thanks to the Zealots's Charge ability. These 4 Zealots will rack up 8 Probe kills (plus more) in a couple seconds.

Dealing with the Colossus

If your enemy gets out too many Colossi, add in Tempest. Really there is no harm in using 1 Tempest per Colossus. Tempest do their bonus damage to Colossus and have such a long range, it is a no-brainer. You have to manually target the Tempest though for best results.

The good thing is that even at 0/0 upgrades, it is still worth getting transitioning into Tempests even against a Protoss with 3/3/3 ground upgrades. Tempests have a very slow but high damage shot that still dishes out a lot of damage even if there is an upgrade disparity. Tempests also have 150 shields, 300 health, and +2 armor, so they do not fall easily to enemy units even if they lack armor upgrades.

Use Force Fields to protect buildings from Dark Templar rushes, such as if your enemy is Dark Templar rushing and trying to take down your Robotics Facility or Pylons. Even if you cannot see the Dark Templar, Force Field pushes them out of range since they are melee. To clarify, if the Dark Templar is trying to take down the Pylon that is powering your Robotics Facility, you can place a Force Field on top of the Pylon, and no melee units will be able to get in range to hit that Pylon. Larger buildings may require a few Force Fields to completely block off.

Playing With 2-Base Phoenix (and how to stop it)

Going for a 1-2 Stargate opener into 4-8 Phoenix is a very common strategy in Protoss versus Protoss. Since a pack of Phoenix is so much faster than any Protoss army, the player with the Phoenix immediately gains map control. If you like a macro-style game, this is a great opener as it allows you to safely take your third base. Your Protoss opponent will have to keep most of his army at home, as before Blink, you need quite a few Stalkers in order to handle Phoenix harass.

If your Protoss opponent decides to push out with Gateway or Robotics Facility units in order to punish you for taking a third base, his main and natural expansion become quite vulnerable to your Phoenix. Even if you lose your third, you can take out a huge number of harvesters before returning back to defend your natural expansion. This will put you in a nice economic lead as you transition into the mid game.

Another way to maximize the effectiveness of the Phoenix is to take advantage of the fact that early-game Protoss armies cannot easily take them down. The Phoenix only takes 10 damage per Stalker shot, so with 60 shields and 120 health, it takes 18 hits from 1 Stalker just to kill 1 Phoenix. A Phoenix cloud in equal numbers with a Stalker pack can take them forever!

This becomes relevant because a standard early-game Protoss force is typically a mix of Stalkers, Sentries, Zealots, the Mothership Core, and possibly a few Immortals. Sentries are extremely weak versus Phoenix, whereas Zealots, the Mothership Core, and Immortals cannot even hit Phoenix. This means the typical Protoss ground army is quite vulnerable against a Phoenix attack. What this allows

you to do is fly directly at the Protoss army and use your Phoenix to pick off the vulnerable, high cost units: namely Sentries and the Mothership Core.

A group of 7 Phoenix can fly into 6 Stalkers and 4 Sentries (a similar resource cost to 7 Phoenix), pick up the 4 Sentries with Graviton Beam, kill all 4 Sentries, and escape without losing any Phoenix or at most one Phoenix. This is a very economically efficient method for combatting the enemy, it wastes a lot of enemy gas, and it kills off early-game Sentries, preventing them from stockpiling energy to use against you later in the game.

If you are not interested in the Phoenix play but instead want to know how to defend it, there are a variety of routes you can go. First off, a single Photon Cannon in each mineral line helps significantly. Not only will this ward off Phoenix, but it will help spot and pick off enemy observers as well as help defend you against Oracles and Dark Templar. Given all the functions that a single Photon Cannon can fulfill, it is worth the resource cost in all Protoss vs Protoss match-ups – just don't sacrifice macro to get them out too early. Make sure adding Photon Cannons is at an appropriate time in your build order.

Additionally, the Phoenix is very weak against Photon Overcharge. You should be liberal about using Photon Overcharge on either Nexus with your Mothership Core. This will quickly chase off any Phoenix. Since Phoenix cannot attack buildings, you do not have to worry about "wasting" Photon Overcharge and leaving yourself vulnerable to a ground-based timing attack. A Protoss player with 2 Stargates producing Phoenix is not going to be able to afford a viable ground-based army that early in the game.

With Photon Overcharge and Photon Cannon support, you can sprinkle a few Stalkers in each mineral line. This will be more than enough to handle any sort of Phoenix harass. Keep the rest of your Stalkers near your Sentries in order to protect the Sentries from getting sniped as mentioned a few paragraphs back.

Remember that Phoenix cannot attack buildings, and Protoss players that go for Phoenix will have smaller ground armies. This means that you can send out a Probe and take your third expansion when you see Phoenix and there is little the opponent can do about it. The Phoenix might snag your Probe, but once the Nexus and supporting Pylon(s) have started construction, they are going to finish unless your enemy moves across the map with ground units. Once you get a supporting Photon Cannon up or two, it will be safe to move your Probes down to the third base. You can build up your Probe count by heavily saturating the main and natural expansion and then transfer your excess workers once the third base is secured. This is a great way to take an economic lead (or at least not fall behind) versus a Protoss player that opens with Phoenix play.

If the Phoenix harass does not let up by the 11:00 mark, consider adding a few High Templar to the mix and using Feedback. Not only will Feedback kill weaker Phoenix, but on the ones it does not kill, it will drain their energy. No energy after getting hit with Feedback means that the Phoenix will not have the energy to use Graviton Beam which means they really cannot do anything to harass you. The Phoenix that manage not to die outright to Feedback will be very weakened and easily destroyed by a few Stalker or Photon Cannon hits as well. Given that a single High Templar with energy can cast Feedback

multiple times, as soon as you get out a few well controlled High Templar, any Phoenix harass is effectively over.

Phoenix vs Observers and Oracles

When you are really behind in a game and are on the verge of losing, one valuable “desperation move” is using your Phoenix to kill off your enemy’s detection. A few Phoenix can kill an enemy Observer instantly and an Oracle in a few shots. Both of the latter units are light so they take bonus damage from Phoenix attacks.

Since Phoenix only attack air units and Observers are flying units, if you fly near a Protoss ground army with a group of Phoenix and an Observer (to stop the enemy’s Observer), the Phoenix will automatically target and take out the enemy’s Observer. This happens incredibly quickly, and given how much faster Phoenix are in comparison to Observers, there is nothing the opponent can do to easily stop this from happening.

Once you kill off the detectors, you can use a few Dark Templar to attack the enemy’s army directly. With no detection, the enemy will be unable to see your Dark Templar. They will either have to run away until they get out more detection or try to ignore your Dark Templar. Either way it is to your advantage. If they run, you have some breathing room to re-macro up to get yourself back in the game. If they do not, your Dark Templar will take down all their units for free!

You can push this advantage even further if you take your Phoenix and Observer and fly over the enemy’s Robotics Facilities. You can keep picking off Observers as they spawn. Your enemy will have to warp in a large number of units or retreat their army regardless just to chase your Phoenix away so they can get a few Observers out.

Stopping SkyToss

Void Rays and Tempests are good against most Protoss units, but both are somewhat weak versus the Archon. Tempests are too slow to easily kite the Archon despite their large range. It also takes 10+ Tempest shots (depending on upgrades) to kill a single Archon. Should Tempest numbers get really high, it is possible to snipe Archons at which you will want to take steps to stop the Tempest. Void Rays can somewhat outrange Archons, but Archons are the faster unit, so flawless kiting is not possible with the Void Ray. Perhaps more importantly though, Archons are not considered armored and as a result take very little damage against Void Ray attacks. Archons will tank a Prismatic Alignment as if it was not there because Archons do not take bonus damage from Prismatic Alignment!

In general, Archons are strong versus practically everything a Protoss player can build. Due to their short range however they do need to be supported. How you support your Archons depends on your

upgrades and what units your opponent is using. If you have great ground upgrades, using Blink Stalkers to support your Archons is your best bet. Protoss players rarely get fully upgraded air units, and if you have an upgrade advantage, Blink Stalkers can shred any Protoss air unit.

If you do not have very good upgrades, you will want to mix in Void Rays and/or Tempests. Tempests are great if the Protoss opponent has Carriers as part of their air army, whereas Void Rays can handle Tempests, other Void Rays, and even Stalkers. If you have spare minerals, it does not hurt to add some Zealots to the mix. Even though Zealots cannot hit air units, you should have a lot of extra minerals if you are going heavy on Archons, Tempests, Void Rays, and/or Stalkers. You can use these for backstab attacks on your opponent's expansions and mineral lines while your opponent is distracted fighting your main Archon/Tempest army with his air units. SkyToss is quite slow so it is hard to defend against multi-pronged Zealot attacks.

If you plan on mixing in Archons, don't forget to upgrade your shields by the late game. Archons gain almost no benefit from ground armor since all almost all their "health" is in the form of shields. Archons with no shields are particularly weak against Carriers, so this becomes even more important if you are using Archons to help counter SkyToss.

Two variants to this would be if the Protoss player going for SkyToss gets just mass Void Rays or just mass Tempest. Mass Void Rays actually fair well versus Stalkers and Sentries. In order to stop this build with ground units, you either need to use Archons and High Templar or well-microed Blink Stalkers. Archons and a few Psionic Storms can simply ignore Prismatic Alignment. If you are using Stalkers, you need to use Blink to avoid the Void Rays while Prismatic Alignment is active, then use the Stalkers to chase down and kill the Void Rays before Prismatic Alignment comes off of cooldown.

Mass Tempest is harder to deal with. The easiest way to deal with it is to make Tempests and get out more of them than your opponent has. This of course requires an economic advantage. If you are behind economically and your opponent is massing Tempests, your options are more limited. Blink Stalkers and Archons work against Tempests, but only if you have good +Weapons upgrades on the Stalkers and only if you control the Stalkers intelligently.

In order to gain the lead in a game where you are behind and your opponent is making a lot of Tempests, you may need to inflict damage via a drop or Warp Prism. Tempests are extremely slow, and have relatively low DPS versus ground units. They are not very good at stopping Zealot warp-ins, so fly in a Warp Prism or two full of Zealots in a dual-pronged drop, drop the Zealots, then warp in a reinforcement wave of Zealots at whatever base is least defended. Tempests are expensive, so if you can slow down your opponent's economy, you can prevent them from getting too many Tempests.

Stopping the Colossus and Ground-Based Robotics Facility/Warp Gate Builds

If your opponent is going heavy on Colossi, you need to get out Tempests. Tempests can kill Colossi so fast since they do a base of 85 damage per hit (with no upgrades) to massive air units. Colossi count as massive air units, so they take the 85 damage per hit.

You only need 1 Tempest for every 1 Colossus that your opponent has up to 5 Tempests. You do not need any more than 5 Tempests at any given time, as 5 Tempests can 1-shot a Colossus. Any more than that and you are setting yourself up for a counter attack or tech switch which could leave you vulnerable. Additionally, Tempests are really expensive so you cannot afford to produce too many of them. With that said, Tempests are fairly good versus practically everything Protoss can build, so investing in Tempests to stop Colossus will not be wasted resources if your opponent changes tech with their reinforcement wave.

In order to get the most out of your Tempests, make sure to manually use them to attack the enemy's Colossi (or other Tempests). This ensures they do their 85 damage per hit. If you just attack-move with the Tempests, they will attack whatever is closest to them. If you are wasting Tempest shots on Zealots when the enemy's Colossi are in the back freely nuking your units, you are going to lose the battle.

Always try to save your Tempests by microing away the ones with the lowest HP. With good control, you can keep Tempests alive for the entire game. Tempests really pay off in any Protoss army if you can keep them alive most of the game. If they die quickly after you produce them, they are typically a waste.

Only Max Out Moments Before Initiating A Major Assault

When you are maxed out, you cannot warp in reinforcements to any of your expansions that may be getting attacked by a Warp Prism assault. If you are sitting in the center of the map with a 200/200 army, your opponent can wreak havoc by warping in a handful of Zealots to your furthest expansion. Normally, a few Pylons and a Photon Cannon would suffice for defense, as this would buy you enough time to warp in a few Zealots as counter defense. However, if you are maxed out, you cannot warp in any units.

As a result, you never want to max out until right before you are ready to attack your opponent with a major assault. You should have forward Pylons or a Warp Prism (or both) with your army, so warping in a few units to hit 200/200 before you go in should not be a problem at all.

If your opponent is maxed out, you can take advantage of this by regularly warping in Zealots to attack his distant expansions. A few Zealots can do a large amount of damage if the Protoss player cannot warp in reinforcements due to being maxed out. This becomes more potent as the game goes on and Zealots get more upgrades. A handful of 3/3/3 Zealots are strong against Photon Cannons and can shred through Probes and a Nexus in a few seconds.

Take advantage of this if your opponent is maxed out by regularly initiating Zealot and Dark Templar attacks on their furthest expansions (or even in the main).

Gaining a Position Advantage in the Late Game

It can be very nerve-racking in the late game when you and your opponent are stalemated and both control large armies. You have to be careful about how you engage as you do not want to accidentally lose your whole army by engaging at a bad position.

You can gain a position in PvP through the use of Time Warp and Psionic Storm. If there is a space between you and your opponent's armies that you do not want your opponent to be able to move into, drop Time Warp in that area. A Mothership Core with full energy can use two Time Warps back to back, so this can cover a very large area. You can place the first Time Warp where you do not want your enemy to be able to enter and the second one a bit further out than that, covering some of your opponent's units.

If your opponent is halfway smart, he will have to pull back and stay out of the Time Warp field, allowing you to move forward into the new "safe zone" you have created. If your opponent tries to push in the Time Warp field, you can use Psionic Storm on his units. A Protoss ball stuck in Time Warp getting Psionic Stormed is an easy win for you.

This strategy is great for picking off the late-game expansions in the center of the map that are completely open. You can use Time Warp to push your opponent's army away from their own expansion, snipe the expansion, then pull out before Time Warp wears off. If the opponent tries to enter the Time Warp field anyway to defend their expansion, use Psionic Storm as described above.

If you get caught by this combination by your enemy, you must pull out. You cannot engage a similarly-sized army if you took a full-length Psionic Storm before the engagement started. If you are worried about crawling your way out of the Time Warp field, you can sacrifice 1-2 Archons or Immortals by throwing them at your opponent while the rest of your army retreats. These units take up a lot of space and will slow your opponent down just long enough for you to squeak through the Time Warp fields. While it is not ideal to give away an Archon or Immortal to your opponent, losing a few hundred resources is better off than losing your entire army and ultimately the game!

Sacrificing Probes in the Late Game

In Protoss versus Protoss, moreso than in any other Protoss match-up, the late game often comes down to 2 maxed out armies clashing against one another. Whichever player wins this major battle then often goes on to win the game, as building up a large ball of high-tech Protoss units typically takes too much time. Usually, if you lose your ball, the enemy Protoss still has a lot of their army left, and immediately

pushes in on your main. On the other hand, if you win the battle and destroy your enemy's ball of units, you can push in on their base and end the game.

One way to get an edge here is to sacrifice Probes in the late game. What I mean by this is that if you are getting closed to maxed out, have finished upgrades, and still have a sizable bank of resources left, you may want to throw away some Probes in order to free up supply for a bigger army.

Imagine you are at 200/200 supplies (you just warped in your last 10 supplies and are ready to attack), with 70 Probes and 130 supplies worth of army units. Imagine you have an opponent with a similarly-sized army with a similar Probe/army supply distribution. If these two armies collide, who is going to win the fight? Either person could win, depending upon how well the units were microed, the army composition, and the positioning of each player.

Now, imagine you had 4000 minerals and 3000 gas banked up with the same size army as described above. If you sent 35 Probes on a suicide mission and used your banked resources to create new units, you will now only be at 35 supplies worth of Probes and 165 supplies worth of army units. If your 165-supply army battles against an opponent's 130 supply army (since they have 70 supplies tied up in Probes), who do you think is going to win the fight? Positioning, micro, and army composition will still all contribute, but your 165-supply army is much more likely to win in this scenario.

Once you have killed off the enemy Protoss' main army, you do not need to re-macro significantly. You want to replace the units you have lost, but if you have banked resources as recommended before sacrificing your Probes, you should have the minerals and gas you need to rebuild the few units that you lost in the main attack. If you destroyed your enemy due to having a much larger army, you likely took a huge economic advantage and can typically carry this momentum into a win in a short amount of time.

Since this strategy is particularly effective in mirror match-ups, be careful when your opponent throws away Probes. If it is late in the game and Probes are getting sacrificed, it may mean your opponent is clearing supplies in order to make an even larger army. You may have to follow suit just to stay competitive should you see this unfold.

Protoss vs Terran

With the introduction of the Mothership Core and Widow Mine, Protoss versus Terran match-ups involve a lot more action in the early game than they did in Wings of Liberty.

Stalkers, Marines, and Time Warp

If you are struggling versus Terran in the early game as Protoss, odds are you are not microing your Stalkers properly. While Stalkers may suffer against Marines in the late game once Medivacs, Stimpack, and Combat Shield are available, in the early game, Stalkers can destroy large numbers of Marines with proper micro. Learning this micro will significantly improve your strength against Terran in the early game.

The Stalker has a +1 range advantage over the Marine, the Stalker is faster than the Marine, and the Stalker deals more damage per hit than the Marine, but with a longer cooldown. This means that the Stalker can shoot the Marine, run away until it gets its 1 range difference back, stop briefly to attack, then repeat this process until the Marine dies. The Marine(s) will likely get some shots off in the process, but when you get low on shields, just retreat and allow the shields on your Stalker to restore. You never actually have to take damage on your Stalkers against early-game Marines. Stalkers are faster than Marines, so if the Terran tries to just escape back to their base with their Marines, you can chase them down and kill them without risking your Stalkers.

Previously, while pure Stalker could earn the Protoss map control, there was no easy way for Protoss players to attack Terran because the Terran could put their Marines on the high ground and there would be no way for the Stalkers to see into the Terran base. However, with the introduction of the Mothership Core, this unit can provide vision for the Stalkers so they can hit Marines clustered on the high ground. You can also attack Supply Depots from the low ground while the Marines try to hide behind their building wall.

Time Warp amplifies this situation to the extreme, because Marines hit with Time Warp are so easy to micro against with your Stalkers. If Marines are in a Time Warp, it takes them a long time to close that 1 range distance with the Stalker. Just keep backing up, stopping to fire a single shot and then continue to back up. If the Marines try to flee, Stalkers can do so much damage as the Marines crawl back through the Time Warp. This is really effective when you are attacking Terran structures on the low ground and the Terran runs down their ramp with their units. You can use Time Warp on the ramp and those Marines are stuck out in an exposed position.

Dealing with Proxy/Early Widow Mines

If the Terran player proxies a Factory in or near your base or tries to run a Widow Mine into your mineral line, there is not a lot you can do about it in the early game to prevent losses entirely. However, there is a lot you can do to minimize your losses. You may have to sacrifice a Probe or two for the greater good. This simply means that when the Widow Mine enters your base and burrows, sit a Probe on top of it. The Widow Mine will proc, killing just 1 Probe. About 30 seconds later, do this again, making sure no other Probes are within range.

Repeat this as long as necessary in order to get an Observer out. Once you have detection, Stalkers can outrange the Widow Mine in order to take it out safely (Stalkers have a range of 6, the Widow Mine has a range of 5).

Note that if you go early air, Oracles can act as detectors as well with their Envision ability. This prevents you from taking a “build order loss” if you open with a fast Stargate and the opponent rushes Widow Mines. By this time, you should have been able to get an Observer out. Oracles however need to be careful not to get too close to an armed Widow Mine as they will get 1-shot by its Sentinel Missile.

Oracle Openers versus Terran

Variations of an Oracle opener are so powerful, that they are almost always the opener of choice in PvT for the top tier players. These builds involve rushing to get out an early Oracle, then taking advantage of the Oracle’s high DPS against workers to try to pick off as many SCVs as possible.

The most common way to take advantage of the Oracle in the lower leagues is to perform a proxy attack. This involves building a hidden Pylon and Stargate near the Terran player’s base by air (but not by ground) and then Chrono Boosting out an Oracle and sending it in to the Terran’s base. By proxying, you save the travel time of having the Oracle fly across the entire map. The goal here is to get the Oracle to the Terran player’s base so early they have nothing to stop the attack.

The reason this works so well against Terran is that there is little anti-air available at this stage of the game to stop the Oracle. Oracles are great versus Marines. One Oracle will actually beat 5 Marines in a fight. Against 3 Marines or less, the Oracle barely takes any damage. In the early game when this strategy is used, Marines do not have Combat Shields or Stimpack, so they are very susceptible to Oracle attacks.

However, as you get higher in the ranks, players will have more experience defending against the proxy Oracle and will have figured out ways to stop it: namely running away from the Oracle, using Missile Turrets, or via Widow Mines. Fortunately, there are a few strategies you can use to make the Oracle opener successful even in spite of these counters.

All of these Terran strategies for dealing with the Oracle can be hindered by combining a Stalker and Mothership Core attack on the front of the Terran's base with the Oracle going into the back. The idea here is that 2+ Stalkers and a Mothership Core can handle any early Terran unit combo. Before Concussive Shells and Stimpack, Marines and Marauders cannot take out Stalkers and the Mothership Core. In particular, Stalkers can outrange Marines and are faster than them, allowing the Stalkers to slowly take them out. Marauders on the other hand, while strong against Stalkers, can be stopped with a few Zealots, especially with a well-placed Time Warp.

If you can kill off enough Marines with your Stalker and Mothership Core, there will be nothing to defend against the Oracle. If the Terran player builds Missile Turrets, your Stalkers can take them out. If the Terran player gets out Widow Mines, you can split up your Oracle, Stalkers, and Mothership Core, so that it will take many Widow Mines to defend the Terran base. You can also try to avoid Widow Mines the best you can, forcing the Terran player to attempt to unburrow them. If the Widow Mines unburrow, you should be able to kill them before they get back in the ground. If you can kill off most of the Widow Mines plus the Factory, you will win the game.

There are two ways you can go with this attack. If you are inflicting a lot of damage and you suspect you are getting close to being able to overwhelm the Terran's forces, you may want to keep warping in extra Stalkers and Oracles and try to end the game right there. If the Terran player starts getting too many Widow Mines, Missile Turrets, or even Bunkers, you can use your map control to take your natural expansion. You should be way ahead if you decide to expand from a well-executed Oracle/Stalker/Mothership Core opener.

Stopping Widow Mine Drops

In PvT, you will want to get a single Photon Cannon in your mineral line if you suspect the Terran player is going to try to drop Widow Mines in your mineral line. If it is placed centrally, a single Photon Cannon can protect an entire mineral field. A single well-placed Photon Cannon is more effective than 3 poorly placed ones, so make sure you actually plant the cannon right in the center of your actual mineral line.

A tight, "sim city" style base layout helps here. This refers to building all your buildings very close to each Nexus. This defensive style makes it easier to defend against drops and makes it hard to attack the Protoss base without being within range of Photon Overcharge.

Fast High Templar are a great way to shut down annoying Medivacs. Feedback on a Medivac may kill it in one hit, particularly if you have been able to weaken the Medivac with a few Stalker or Sentry shots. Since High Templar start with enough energy to Feedback and Feedback does not need to be researched and you only need to use Feedback once per Medivac, this can be part of your defense reasonably early in a game of Starcraft 2.

Stopping Late-Game Medivac Harass

With the Ignite Afterburners ability, the speed of Medivacs makes them very difficult for Protoss players to deal with in the late game once the Terran player starts multi-pronged drops. You have probably been a victim of this before, where 1-2 Medivacs drop in the main, and when you go to defend, they scoop up their units at the last second and flee to safety. Meanwhile, 1-2 different Medivacs drop on the expansion at the furthest point from the first set, ping-ponging your army and destroying your base and economy in the process.

In order to stop this sort of harass, you need to get out Phoenix or Blink Stalkers. No other unit is fast enough to chase down Medivacs and destroy them. It does not hurt to get 1-2 Photon Cannons in each base, but you cannot afford too many unless you have a base lead on your Terran opponent. You would need a lot of Photon Cannons to drop 2 fully loaded Medivacs anyway, so it is not really possible to completely defend against drops in the late game with only cannons.

If your micro is good, the High Templar is an amazing unit to use on Medivac defense. Feedback can 1-shot a Medivac that has full energy, quickly destroying the Medivac and all the units inside. Even if you do not kill the Medivac, draining its energy makes the drop a lot less threatening.

Most Medivacs will not have enough energy though to be destroyed in 1 hit by Feedback. However, no Medivac can handle a Feedback plus a few shots from a Blink Stalker, and there is no way for the Medivac to avoid taking at least a few shots from a Blink Stalker. Phoenix can also chase down Medivacs with ease, which is why I recommend those as well. Both work, pick the one that fits your technology route for your particular build.

Wall Off Your Expansion Ramps

Once you take a third base, you need to take care to prevent Hellion run-bys. Most third base locations have 2 entrances to them – one near your main and one that is on the opposite side of your main. You need to secure the entrance that is far away from your main to prevent Hellions and Widow Mines from sneaking in the back and wrecking havoc in your third (or fourth or fifth) base's mineral line.

One easy way to do this is to completely wall off the far ramp/entrance with Pylons and placing 1 Photon Cannon behind the Pylon wall. Pylons are needed for supplies anyway and this will give you the ability to safely warp in units to this part of the map in addition to protecting your base from Hellion and Widow Mine run-bys.

This of course does depend on the map. Some maps have destructibles that you can use to wall off the third base, whereas some third bases are completely open, which may require a different building structure in order to protect (1-2 cannons and a few pylons placed closed to the mineral line).

Beating Battlecruisers

Protoss players have a variety of methods for beating Battlecruisers. Without a doubt, the Protoss Tempest is the best way to handle the Battlecruiser. It does so much damage from such a long range that the Battlecruiser does not stand a chance. You need to micro the Tempest however, running it away from the Terran army in between shots while the attack resets (Tempests can only attack one time every 3.3 in-game seconds) and avoiding overkill (in a 12 Tempest vs 12 Battlecruiser battle, you do not want all 12 Tempests to fire off a shot against the same BC – you would want to spread the attacks out across 2-3 Battlecruisers to inflict maximal damage. You also need to protect the Tempest from Vikings, which can be done with a few Stalkers or Void Rays.

The problem with saying “get Tempests” is that Protoss players are often taken by surprise when they see Battlecruisers on the field. This is a common Terran transition when the Protoss player goes for Robotics Facility play, which means the Protoss player typically will not have more than 1-2 Stargates and definitely will not have a Fleet Beacon. Getting up a Fleet Beacon and an extra Stargate or two and then getting out Tempests can take a Protoss player several minutes. During these several minutes, the Battlecruisers will not be sitting idly by. So what is a Protoss player to do?

In equal numbers, Stalkers perform fairly well against Battlecruisers, **assuming upgrades are equal**. However, Protoss players tend to lag behind on upgrades versus Battlecruisers, and 3/3 Battlecruisers will destroy Stalkers that are not 3/3/3 as well. Even 3/3 Stalkers with 0 Shields are at a slight disadvantage versus Battlecruisers. Stalkers also suffer against the Raven's Point Defense Drone.

Void Rays do okay versus Battlecruisers, but well-microed Vikings can counter them unless you support the Void Rays with Stalkers. Void Rays are also very weak against Yamato Cannon. I mention Void Rays here because if you really get surprised by Battlecruisers you need to do everything you can to mount an appropriate defense. Why make only Stalkers when you can also make Void Rays out of your Stargates? No need to let your production facilities sit idly by waiting on a Fleet Beacon when you are in such a dire situation.

The real game-changer though is getting out a few High Templar. Feedback prevents the Battlecruiser from using Yamato Cannon and deals anywhere from 50 to 200 damage depending on the amount of energy the Battlecruiser has. Additionally, you can use Feedback to counter Ravens and Point Defense Drones (PDD), which are otherwise deadly for the Protoss player as PDD absorbs a lot of Stalker and Tempest shots while the Battlecruisers attack freely. Note that you can use Feedback to destroy a PDD. Feedback costs less energy to use than PDD, so this is a worthwhile trade of energy.

Perhaps the best way to defend against a Battlecruiser transition is to predict when they are coming. This requires knowing a little bit more about Battlecruisers in general. First, they are extremely expensive, costing 400 minerals and 300 gas for a 6 supply unit. When a Terran player suddenly appears with 6 Battlecruisers, that is 2400 minerals and 1800 gas worth of units. For 12 Battlecruisers, this is 4800 minerals and 3600 gas (and only 72 army supplies)!

Additionally, Battlecruisers are very weak at 0/0 and very strong at 3/3 upgrades. The reason for this is that Battlecruisers have a very fast but very low-damage attack, and start with a high base armor. Each weapon upgrade is a major increase in DPS and each armor increase is a major increase in effective HP versus units with low-damage attacks like Stalkers or Phoenix.

As a result, in order for a Terran player to suddenly and secretly transition into Battlecruisers, they:

- Need 4 (or more) bases. A Terran player is not going to be able to bank up the large amount of gas they need suddenly transition into producing 4+ Battlecruisers at once on just two or three bases.
- Presence of Air Weapon Upgrades. Terran players going mech or bio with no interest in an air transition will rarely research ship weapons. Terran mech or bio players get a handful of Vikings out to stop Colossi, but other than that, there are no units in their army that actually benefit from ship weapons upgrades. As a result, if you start seeing +1 and +2 ship weapons appearing on the few Vikings that are supporting a large Siege Tank and Hellbat army, prepare for a wave of Battlecruisers in the near future.

Without a large economy, getting out a big surprise Battlecruiser fleet is not possible, and without air weapon upgrades, Battlecruisers are not that threatening and can be stopped easily with Stalkers, so keep an eye out for these two things if you are losing games due to getting surprised by a Battlecruiser transition.

Fighting Pure Mech Builds as Protoss

Since the beginning of Starcraft 2, using Gateway units backed up by Colossi, High Templar, and/or Archons has been a viable build for Protoss players to use against any combination of units the Terran player can come up with. However, in Heart of the Swarm, this has changed, and many Terran players are going for full mech armies against Protoss.

One easy way to counter this in the mid-game is to sneak a few Void Rays out and surprise the Terran forces. Terran Mech has virtually no anti-air capacity, and just a few Void Rays with their Prismatic Alignment ability activated will shred through an entire tank line in just a few seconds. Thors are weak against Void Rays as well and Thors are too slow to run away from Void Rays. Widow Mines cannot 1-shot Void Rays either. Void Rays can also pick off any Medivacs in the air. Do not let your Void Rays waste time focusing on the Hellbats. Hellbats are very cheap to build and do not take bonus damage against Void Rays so this is a waste.

Instead, you want to use your Void Ray's time to focus down Siege Tanks and Thors. Once the Siege Tanks are gone, Hellbats, Thors, and Widow Mines are not much threat against Colossi, Archons, Immortals, and Stalkers. Zealots will be weak against Hellbats, so no need to mix those into your army. If

you have extra minerals, spend them on cannons to protect yourself from drops and warping in Zealots through proxies or Warp Prisms to harass the Terran player.

The best part about countering full mech builds with just a couple Void Rays is that the investment is minimal and can be hidden. A single Stargate can turn out 3 secret Void Rays with Chrono Boost in 2 minutes without enough diverting enough resources to raise suspicion.

Fighting Mech Builds Without Stargate Technology

While a few Void Rays can decimate an early, unprepared mech army, this secret switch to Void Rays does not work well if there are Marines mixed in with the Terran army or if there are already a few Vikings out on the field (Terrans often produce Vikings in response to Colossi). In these situations, a ground-based army can still work.

Against a full mech build, a good army composition is Archon/Immortal. Archons are very strong against Hellbats. Archons are not light units so they take limited damage from Hellbat attacks. On the other hand, Hellbats are considered biological units so they take bonus damage from the Archon. Archons are also strong versus Siege Tanks, as Archons are not considered armored units and hence take less damage from Siege Tanks. Archons also can absorb a full Widow Mine shot without taking permanent damage, as they can just sit out of combat and regenerate their shields back to full. Archons have so much shield totals that splash damage from nearby Widow Mine hits does not matter unless multiple Widow Mines are hitting.

The only mech unit strong against the Archon is the Thor. This is where the Immortal comes into play: the Immortal is strong versus the Thor thanks to Hardened Shields and bonus damage to armored units. While the Immortal takes full damage from the Widow Mine, the explosions should never hit. The Immortal can also handle mass Widow Mines with ease since the Immortal's range is 6 and the Widow Mine's is only 5. You just have to make sure that you have a few Observers with your army. You can also use other strategies for dealing with Widow Mines like using Hallucinations to proc the mines, Psionic Storm to kill them safely from range, or using an Observer paired with a Colossus. Finally, the Immortal is a relatively high mineral-cost unit for being such a high tier unit. Archons cost a lot of gas, so this is a final synergy between this pair of units.

Regardless, you will still have some spare minerals. One powerful (but advanced) strategy for dumping minerals against very anti-ground tech armies with little anti-air is to attack the Terran player with all your units, wait for the Widow Mines to proc, then fly a few Warp Prisms to the *back* of the Terran forces by the Siege Tanks. You can then warp Zealots in in the back of the Terran army right on top of the Siege Tanks! This is very hard for mech-heavy armies to stop because mech armies do not have much anti-air. They will not kill the Warp Prisms in time to stop the warp due to a lack of anti-air. If you use just one Warp Prism, Thors or Vikings might take it down, but it is very hard for the Terran player to stop 2-3. Do not worry about supply cap space because by the time the Warp Prisms get into position,

some supply cap space will already be freed up due to the units lost in the first few seconds of the attack.

This really punishes the Terran player who tries to mass Hellbats, Thors and Siege Tanks without getting a completely balanced army. Even though Hellbats counter Zealots, this works very well because Hellbats and Siege Tanks are both very slow and large units. If the Terran has their Siege Tanks in the back and their Hellbats in the front and you warp your Zealots in the back, the Zealots will rip through the tank line long before the Hellbats can get into position. With no tank support, the mech army falls to pieces.

The only thing you have to watch out for is a transition into cloaked Banshees. It is very easy for a meching Terran player to sneak out ~4 Banshees, especially if they use a very Hellbat-heavy army (Hellbats cost no gas). Banshees can directly engage Immortals and Archons (should the Banshees outnumber the Archons) and will take them out quickly. You should not be surprised by the cloak itself – always keep Observers with your army anyway as you need them to spot Widow Mines.

Against a few Banshees, keep a High Templar or two on tap with your army for Feedback. Feedback will drain all Banshee energy, taking away cloak and dealing damage. A few weakened Banshees without cloak can be taken down by a Stalker or 2 or even the Archons themselves. If large numbers of Banshees appear, mix in a few Phoenix with your army. This is not a very big investment and getting out 1 Phoenix for every 1 enemy Banshee is more than enough to quickly counter them. Banshees cost more resources and an extra supply, so even though Phoenix cannot hit ground units this is a worthy trade.

Killing off Vikings as a Priority in Late Game Battles

The Colossus is the perfect answer to any bio-based Terran army. With Extended Thermal Lances and a ground-based army to act as a buffer, it is strong versus Marines, Marauders, Ghosts, and even Hellbats. Unfortunately, the Colossus is also very weak against the Viking. After all, the Viking does bonus damage to the Colossus and the Colossus cannot even fight back!

If the enemy has a fairly low-modest Viking count, you will want to try to kill them off. A lot of players do not realize this but the Viking has no native armor and only 125 HP despite being classified as an armored unit. As an armored unit, it takes extra damage to the Stalker. Additionally, Psionic Storm can knock off 2/3 of a Viking's HP if the Viking sits in it the spell effect for Psionic Storm's full duration. A handful of Stalkers can kill off a fleet of Vikings weakened by Psionic Storm in a few shots, focus firing them down one at a time. You can quickly burn down your opponent's Vikings long before they kill your Colossi. With no Viking support, your Colossi will roll through their army with little to no effort.

One common response to this if you kill off your enemy's Vikings a time or two is for them to overproduce Vikings. When this happens, sniping the Vikings may no longer be viable. Fortunately, there is a solution – switching to Archons!

Using Archons against Bio

Archons are a great unit to use against bio Terran forces. They are a natural transition when your opponent gets out way too many Vikings. You can use Psionic Storm and Feedback (on Medivacs or Ghosts) with your High Templar, and once they drop their energy, morph them into Archons. If you are using Archons instead of Vikings as your source of splash damage, then the Vikings are rendered useless. After all, Vikings are unable to attack ground units while the Vikings are in the air. If the enemy has too much supply tied up in Vikings, you will be at an extreme advantage.

This strategy works well until the Terran player starts working in large numbers of Ghosts. If there are only a few Ghosts, you can still use Archons successfully just by spreading them out. However, once there are 5+ Ghosts out on the field, your Archons become much weaker. A few EMPs on an Archon can reduce its shields to zero. At this point, surprisingly the easiest and most effective thing to do is to just switch back to Colossi!

Beating Mass Ghost & Viking Bio Combos

Sometimes, Terran players will make large quantities of Ghosts, Vikings, and Medivacs with a few Marauders and Marines as support in order to try to counter both Archons and Colossi. Vikings can kill off the Colossi, whereas Ghosts are strong against Archons. Ghosts are also great versus Zealots, Immortals (thanks to EMP), and Sentries. They're only okay versus Stalkers, but with Medivac support, they do okay even against Stalkers.

If the Terran player goes this route, you just need to add in a sizable number of Blink Stalkers. What you do is ignore the Ghosts and use your Stalkers to pick off the Medivacs. The Ghosts will take out a few Stalkers, but Stalkers have a decent amount of HP and do not take a lot of damage versus Ghosts, so the Stalkers will rapidly pick off all the Medivacs. With no Medivac support, Stalkers are better than Ghosts – even with EMP it is not a close fight. Vikings would have to land to fight the Stalker, so again, not a comparable fight.

Mass Blink Stalker though is very vulnerable to the Terran if they mix in even only a few Marauders into their army. For this reason, consider adding in a handful of Tempests as support. Even though Tempests do not deal bonus damage to Vikings and Vikings deal bonus damage to Tempests, a 3/3 Tempest will beat two 3/3 Vikings in a battle. This may seem counterintuitive but this is how it works – try it out in a unit tester yourself. The reason for this is that the Tempest has 150 shields and 300 health, whereas each Viking only has 125 health a piece. A Tempest will take down a Viking in just 4 hits when the Tempest has +3 weapons. It is also difficult for Vikings to actually attack Tempests, given that Tempests have a range of 15.

Tempests are also very strong versus Ghosts. Naturally, the Tempest does well versus Medivacs and Marauders, as the Medivacs and Marauders cannot hit back. Tempests can even hold their own against

against Marines if upgrades are comparable. Just make sure you only use a couple Tempests. Any more than that and they start to interfere with another due to overkill (overkill is when every unit fires at the same target weak target, resulting wasting damage).

A more balanced Terran army is much more threatening: one with sizable numbers of Vikings, Ghosts, Marauders, Medivacs, and Marines. To counter such an army, you should ideally add some Colossus and Tempests on top of a Gateway base. If the Terran player focuses down your Colossi with their Vikings, they might destroy them, but all of your Tempests should live by the time you focus the Vikings down. Additionally, landing a few good Psionic Storms or Feedbacks during the engagement before your High Templar get sniped or EMP'd helps a lot as well.

Countering Ravens as Protoss

Ravens are not used much in PvT matches since they are easily countered by Protoss players. However, if you are unprepared or do not know what to do, the Raven can cause a lot of damage. The easiest way to stop the Raven is to prevent it from casting entirely by using Feedback. You can use Feedback to drain the Raven's energy and possibly kill it outright. You will not get the Ravens 100% of the time this way, so you should have a plan in place for dealing with the Raven's abilities.

Ravens will typically focus on using the Point Defense Drone (PDD) against Protoss players. This creates a floating unit with 50 HP that has the ability to fully absorb shots from the Stalker and Phoenix. There is no cooldown on this skill, but it costs 10 energy for the PDD to "cast". The PDD starts with 200 energy, so it can absorb 20+ shots (it regenerates energy over time) before a Stalker or Phoenix can damage it. The interesting thing about the PDD is that it is flying, so it cannot actually be hit by melee attacks. Absorbing 20+ Stalker shots per PDD means that if the enemy is using Ravens with PDDs and you are using Stalkers, your Stalkers are completely useless unless you can do something about the PDDs.

Fortunately, the Protoss has many ways to counter the PDD. The ideal situation is to just use Feedback on the Ravens before they actually get to cast a PDD. Even if you are too late on your Feedback on the Raven, you can use Feedback on the PDDs. This drains all energy from the PDD and deals damage equal to the amount of energy drained. Since the PDD starts with 200 energy and only has 50 health, using Feedback on a PDD nearly always kills it. The only way the PDD would survive would be if it had already blocked a lot of shots, which means that you are very late with your PDD in the first place. Additionally, Psionic Storm will kill a Point Defense Drone as well. Psionic Storm does 80 damage over its duration, and the PDD is immobile and only has 50 HP. If 2+ PDDs are clustered together, just use Psionic Storm and take them all out for just 75 energy. This is more efficient than Feedback and may damage nearby Terran units as well.

If you do not have High Templar on the field and are using Stalkers or Phoenix, you have to be really careful about dealing with the PDD. There are still a few tricks you can use however. First you should know that "beam" type attacks do not get blocked by the PDD. This means that the Void Ray, the Sentry,

and the Archon do not have their attacks absorbed by the PDD. With just 50 HP, you can take a single Void Ray and focus down PDDs in a few seconds. This is a particularly useful practice if you have already spent Prismatic Alignment. Sentries and Archons though have a short range, so getting them in range to attack a PDD can put them at risk.

In a worst-case scenario, there is a little-known trick you can use to burn through PDD energy: Hallucination. PDDs will block the attacks from a Phoenix produced from Hallucination. Since a Phoenix has “2 attacks” per attack, each double laser beam fired drains 20 energy from a PDD rather than just 10. This means a PDD will run out of energy in just 10 hallucinated Phoenix attacks rather than the standard 20. If you make 6 or so Hallucinated Phoenix to send in with your army, they will burn through a PDD’s energy in just 2-3 seconds.

Finally, remember PDDs are not mobile. If there are too many PDDs on the field, just pull your army back and wait out their duration or slowly pick them off (or drain energy) with Feedback, Psionic Storm, or Hallucinations.

The Raven can also use Seeker Missile. While Seeker Missile is a strong ability against other races, it is not as good against Protoss players. The reason is that due to the way Protoss shields work, most of the Protoss player’s high value targets do not take significant permanent damage from Seeker Missile. A Seeker Missile on an Archon for example results in no net damage if the Archon regenerates its shields. If you a Terran player wanted to drain shields, the Ghost is a much more efficient way to do that via EMP. Most of the smaller Protoss units that can be damaged by Seeker Missile are just too fast and can easily avoid it. a good Protoss player is going to Feedback any Raven that drifts close enough to the Protoss army to cast Seeker Missile (Seeker Missile’s range is only +1 greater than Feedback).

There are only two units that are particularly susceptible to Seeker Missile: High Templar and Immortals. They are both sort of slow and have a hard time getting away from Seeker Missile. Seeker Missile will drain through the Immortal’s shields. Just be fast on your Feedbacks or keep these units spread out and safely behind a few Stalkers and they will be fine.

Protoss vs Zerg

Protoss versus Zerg is the most stable match-up for the Protoss player thanks to the Forge Fast Expand opener. By creating an artificial wall with Photon Cannon support, Protoss players are able to secure their natural expansion safely very early in the game. Zerg players respond to this dynamic by frequently taking an early third base.

Using Warp Gates to Defend Expansions

As you take your third base and beyond, you will want to throw down a few Warp Gates near the choke points to the base in order to create an artificial choke point. It is much easier to defend a choke as Protoss in PvZ for a variety of reason: Zerglings are more dangerous in the open field, it is easier to Force Field block smaller openings, and Colossus and Psionic Storm are able to deal more damage to clustered units. Warp Gates are cheap, have a lot of HP, and you can never have too many of them in the late game.

You can further bolster your defenses by sandwiching a Photon Cannon or two in between your Nexus and the Warp Gates. The Photon Cannons will be hard to take since they will get free hits off on Zerglings and Roaches until the Warp Gates get taken down.

Hallucination

Zerg players rarely add detectors to their army against Protoss unless they see a Dark Shrine. You can take advantage of this by using Hallucinate to create Colossi when you go in for an attack. This significantly reduces the effectiveness of the Viper's "Abduct" ability, as the Zerg player will end up using Abduct to grab hallucinated Colossus, missing some of the real ones in the process. Additionally, if the Protoss player only has Roaches and Hydralisks, they may go to great lengths to attempt to focus down your fake Colossi.

Forge Fast Expand

Forge Fast Expand (FFE) opener is your best bet every game. Scout to see if you need to throw down Forge first. If you get six-pooled, you can build a Photon Cannon in your main base's mineral line and just let the Forge die once the cannon is up. You can then start harvesting off of one base. This may seem like you are far behind but you are not, given that the Zerg has to sacrifice so much in order to 6 pool – namely all Drone production. Being on 1 base with 15 Probes to a Zerg being on 1 base with 5-8 Drones is where you end up. You can then build a Gateway in the back of your mineral line (depending

on map shape) in order to get out a Zealot or two. Once you do that, you can push out and take your expansion and play a normal game, with a nice lead over the Zerg player.

As you become more skilled, your FFE should look a little different depending on the map. On the largest, 4-player maps, it is possible to safely go for a Nexus before the Forge. On small maps and 2 player maps, you will likely want to go Forge first. Additionally, you should take 5 minutes to figure out the optimal way to make your wall at your natural expansion on each map. Depending on the shape of the map, your wall will be a little different. In a ranked game you do not want to leave this up to chance, doing it different each time, as not knowing where to put your buildings is just another thing you would have to worry about. As we have discussed throughout this book, you do not want to have to worry about little things like this in a game so you can focus your attention on controlling your units. You also do not want to accidentally mess up your wall placement in a ranked game.

Punish Zerg for Taking a Fast Third Base

When a good Zerg player sees you open with a Forge Fast Expand, there is a high likelihood he will take a very fast third expansion, knowing there is not much you can do about it since you have already committed so many resources to getting out a Nexus and Forge (and possibly a Photon Cannon) before starting a Gateway.

However, just because you do not have Warp Gate technology does not mean you can make an attack, particularly if the Zerg has 4 Zerglings or less in the early game. The easiest and most reliable way to put out a little pressure on a Zerg player is to just Chrono Boost Zealots off of your single Gateway while building a Mothership Core. Once you get out 2 Zealots and your Mothership Core, move in on the Zerg's third base. With your attack, try to kill off Queens as a priority. Queens are the only thing the Zerg can have out that can hit the Mothership Core (aside from building Spore Crawlers), so you want to take them down as a priority. Do as much damage as you can, but do not let your Mothership Core get killed.

The goal of this attack is not so much to get a bunch of Drone and Queen kills (though each one you can get is a huge bonus) but rather to prevent the Zerg player from building nothing but Drones. When you roll in with a few Zealots and a Mothership Core, the Zerg is going to have to make some extra Zerglings and possibly Queens to deal with your attack. Each Larva and 50 minerals spent on a pair of Zerglings is 1 Larva and 50 minerals not being used to make a Drone. Even if you barely take down any Zerg units, every Zergling or crawler you force into production will end up slowing down your Zerg opponent's macro.

A more aggressive (but riskier) method for punishing a Zerg player for getting a fast third base is via Photon Cannons. You can hide a Pylon just out of range of a constructing Hatchery. You can then build a Photon Cannon or two near that Hatchery. Once the cannons go up, a Zerg player who only has access to Zerglings and Queens will not be able to take down those cannons in a cost-effective manner until they tech up to Roaches. This can lock down a Zerg base for a long period of time.

The cannon rush approach works best in the lower leagues, as top players will be more likely to scout it before you get it established. Even if they do not scout it and your rush goes up, top tier players will often just abandon that expansion and take the next furthest base out. If the Zerg takes the next furthest base out, it will not delay the Zerg's macro much. However, it does make that base very vulnerable to a two-base timing push. Taking this into account, a viable build that puts you in control of an entire game from start to finish is opening with a Forge Fast Expand, cannon rushing the expansion, and if successful, moving into an Immortal/Sentry/Stalker all-in attack.

It will take some work to practice such a long build, but if you practice the build in the manner described in this book, you can get the timing down to where it is automatic. At this point, it becomes very difficult for a Zerg who misses the cannon rush to win the game. You need to practice two versions of such a build however – one where the cannon rush works and one where it fails. Since following a pre-set build is incredibly efficient and frees up the mind to focus on micro, you do not want to leave your build/strategy up to chance should your cannon rush get scouted before it goes up.

2-Base Phoenix Opener

Opening with a Forge Fast Expand into 2-Base Phoenix is really strong. Even if you do not inflict a lot of damage with the Phoenix, it hurts the Zerg since they have to use Drones to make Spore Crawlers. Even if you get no Drone kills, you should be able to pick off 5+ Overlords. Also, if the Zerg does not build Spore Crawlers, you can kill plenty of Drones by using Graviton Beam without any way for the Zerg to push you away. It takes forever for a Queen to break through just the Phoenix' shields, so they are not threatening by any means. Between killing Drones, Overlords, and forcing the Drones into Spore Crawlers, it is worthwhile. If you can manage to take out a Queen or any more Drones/Overlords, you end up way ahead in the game.

This map control also lets you get a third base up quickly. Theoretically the Zerg could make a bunch of Zerglings and deny this expansion, but if they are spending extra minerals on Drones (due to the ones you killed plus the ones they converted into Spore Crawlers), Overlords, and Zerglings, their own economy will be extremely delayed.

Beating Early Swarm Host / Hydralisk as Protoss

Zerg players have discovered that mid-game Swarm Hosts and Hydralisks are a potent combination to use against a Protoss player. This is amplified by the fact that Swarm Hosts and Hydralisks share the same upgrades. Swarm Hosts are excellent against all Protoss ground units. Locusts always get a few shots off, even against long range units like the Colossus. Perhaps if the Protoss player had 6+ Colossus out, Swarm Hosts would lose their luster, but good Zergs will use this unit combination long before that many Colossus can be created. On the other hand, Hydralisks perform well enough against Protoss air,

particularly when you consider their low relative cost. Two Hydralisks costs just 200 minerals and 100 vespene gas, whereas 1 Void Ray runs 250 gas and 150 vespene.

Ultimately, mass SkyToss or High Templar/Colossus/Archons will beat this unit combination. The problem is actually getting enough gas to make these builds happen. A top-notch Zerg will hit hard and early, long before you have enough gas to max out on Void Rays, Tempests, and Carriers or Colossus and High Templar.

The trick to making this happen is to prevent the Zerg player from taking a fourth base or alternatively to secure your own third base. If the Zerg has a fourth base and you are stuck on 2 bases, you are going to lose against a Swarm Host/Hydralisk ball. Without a fourth base, the Zerg will not be able to get out an overwhelming number of Swarm Hosts, Hydralisks, tech, and upgrades to make their attack happen at a reasonable time. If you have a third base, it does not matter if the Zerg grabs a fourth base or not, because you should have enough gas to make SkyToss a reality at this point. SkyToss will either win you the game (since Swarm Hosts cannot hit air units) or at least force the Zerg to transition out of using Swarm Hosts.

If you want to stop the Zerg from taking a fourth base and they are using Swarm Hosts, you need to get acquainted with the Warp Prism. Against Swarm Hosts in particular, Zerg players are particularly susceptible to Zealot Warp Prism attacks. Swarm Hosts not only move slow, but have the disadvantage of needing to burrow to spawn Locusts and then unburrow before being able to move again. The end result is that Swarm Hosts cannot be both on offense and on defense. They cannot even really defend multiple bases at once. When the Zerg player tries to take a fourth base, use a nearby Warp Prism to warp in Zealots and attack it. You will cancel this base from constructing (or even kill it).

To clean up your Zealot attacks when using a Hydralisk and Swarm Host army, the Zerg player must slowly move his Swarm Hosts back to where you are attacking. Alternatively, the Zerg player may leave their Swarm Hosts on offense and pull back some Hydralisks. No matter what they pull back to stop your attack, you can then use a second Warp Prism to warp in Zealots at the third base. You will now be attacking on two fronts.

- If the Zerg player splits their Swarm Hosts and Hydralisks between their two bases to secure them, this means that they are giving up map control. Go ahead and take your third base while the Swarm Hosts and Hydralisks are on defense. Use this extra vespene to transition into SkyToss or mass Colossi and win the game.
- If the Zerg player splits up their Hydralisks to stop your attack but leaves their Swarm Hosts on offense, the Swarm Hosts suddenly become very vulnerable to any sort of air attack. Phoenix can pick up burrowed Swarm Hosts with impunity, whereas Void Rays burn down Swarm Hosts incredibly fast. Phoenix have the advantage of being able to pick off Hydralisks very easily as well, should the Phoenix outnumber the Hydralisks.

- If the Zerg player builds a bunch of static defense, just overpower it with Zealots. Zealots trade well against Spine Crawlers and Queens since a Zealot is about equal in strength to either of these units despite costing 50 minerals less (have to count Drone Cost when calculating Spine Crawler cost).

To summarize, if the enemy gets Swarm Hosts and Hydralisks and tries to siege your base, take advantage of their slow army speed and use Zealot Warp-ins to deny their fourth base or to secure your third base. Without getting a fourth base or without denying your third base, the Zerg player will not be able to get out a large enough Hydralisk/Swarm Host army to end the game before you can get a sizable air army to counter their build.

Stopping Zerg Air in PvZ

If the Zerg player tries to go for Mutalisks, all you have to do is get out Phoenix. Phoenix can beat Mutalisks without taking any damage if they are kited properly. Phoenix are faster than Mutalisks and have a range of 5. Phoenix can also attack while moving. Mutalisks have a range of 3 and have to stop in order to attack. This means that if the Phoenix is more than 3 range units away from the Mutalisk, but less than 5 range units away, the Phoenix can hit the Mutalisk without stopping and there is nothing the Mutalisk can do about it. All you have to do is fly around with your Phoenix in this “sweet spot” and you can quickly destroy all the Mutalisks without taking any damage. The Mutalisks die even faster to the Phoenix because Phoenix do double damage to light units (Mutalisks are light).

This may seem like an “open and shut” case, but there is a little more to dealing with Mutalisks than that. First, a typical response of the Zerg player to Phoenix (aside from switching tech) is to protect their Mutalisks with Corruptors. Corruptors have a range of 6 and perform well versus the Phoenix. The solution here is to research the Anion Pulse-Crystals and Air Weapons upgrades. Anion Pulse-Crystals will extend the Phoenix’ range to 7, whereas Air Weapons will help penetrate the Corruptor’s high armor.

While a difference of just 1 range will not completely prevent your Phoenix from taking damage to the Corruptors by kiting like you can do with the Mutalisk, it makes it easier to attack Mutalisks without subjecting your Phoenix to Corruptor hits. Corruptors are much slower than Phoenix so they are easy to avoid while you whittle down Mutalisks. The Corruptors may get a few shots in here and there, but if you micro properly, this will not even penetrate the Phoenix’ shields, which will then regenerate.

Getting +Air Weapons is very important too if you are going to make use of the Phoenix. The way the Phoenix works is that each time it fires an attack, the enemy takes 2 hits at once from a 5 damage laser for armored units, and 2 hits at once from a 10 damage laser for light units. Each upgrade adds +1 damage *per missile* to the Phoenix’s attack. Likewise, each armor point of the enemy reduces the damage of each missile by 1.

A Corruptor has a default armor of 2. This means that at 0/0 upgrades, each 5 damage laser dealt by the Phoenix's attack is reduced by 2, from 5 damage to 3 damage. This means instead of 2 hits for 5 damage each, the Phoenix gets 2 hits for just 3 damage each. This is a reduction of 40%! If the Zerg gets +1 air armor before you get +1 air weapons (a very common scenario), then the Corruptors take hits of just 2 damage each per Phoenix attack laser, for 4 damage total. If the Corruptor gets +2 air armor before you get +1 air weapons, then it is down to just 1 damage each, making the Phoenix completely useless against the Corruptor.

Full SkyToss is great versus full Zerg air builds, so getting air upgrades when you see Corruptors is an excellent plan. It allows you to transition into a full air build, which with upgrades, is very hard for the Zerg player to deflect.

Against Mutalisks alone, the upgrade discrepancy is not nearly as much of an issue. Phoenix do double damage to Mutalisks since Mutalisks are light units. Mutalisks also start with no armor. This means that a 0/0 Phoenix still does great damage against a 3/3 Mutalisk. The Anion Pulse-Crystals upgrade will help out the Phoenix more versus Mutalisks than even 3/3 weapons and armor! Phoenix can kite around Mutalisks so they should not take too much damage from them in the first place. Against mass Mutalisk, a handful of Phoenix plus a ground-based army of Stalkers, Archons, Sentries, and High Templar is likely your best bet, as you can then use this on offense when you are done deflecting Mutalisk harass.

The question then becomes what to do if the Zerg player starts getting out very large numbers of Mutalisks in the mid to late-game. If the enemy is massing air units, getting something like 35+ Mutalisks and 15+ Corruptors, massing Phoenix in response could leave you really vulnerable to a tech switch. What I mean by this is imagine the Zerg player has 100 supplies tied up in air units, and to counter this, you build 20 Phoenix. If the Zerg manages to pick off most of your ground units but loses most of their air units in the process, the Zerg can then make a reinforcement wave of mass Zergling and Ultralisks, against which the Phoenix is defenseless. SkyToss cannot adequately keep up with Zerglings and Ultralisks without some ground support. While you hopelessly try to chase after a ball of Zerglings with Phoenix (or other air units), you can lose a lot of expansions and buildings fending off this cheap counterattack. Additionally, if you make too many Phoenix, it is not exactly easy to transition into offense if you get out too many Phoenix since Phoenix cannot attack buildings.

Protect yourself against by limiting yourself to about 12 Phoenix in total. After that, there are a variety of methods you can use to counter swelling Zerg air armies. If your opponent is going very heavy on air and even mixing in Brood Lords, Swarm Hosts, and/or Infestors, a full-on SkyToss army is exactly what you need. Void Rays are strong versus Corruptors, whereas Tempests and Phoenix are strong versus Brood Lords and Infestors. Carriers are also strong against everything but Corruptors— you can use your Void Rays to focus down Corruptors to maximize your Carrier's uptime. The transition into full SkyToss should be natural if you researched air upgrades as I recommended you do when you see Corruptors on the field. Should your opponent try to switch to mass Hydralisks, all you need is a few High Templar and Sentries added to the mix. Psionic Storm absolutely decimates Hydralisks, and the Sentries can use Force Field to protect the High Templar from Zergling swarms.

If your opponent is going for a more standard Zergling/Mutalisk build, mix in some Archons and High Templar and a few Tempests. Archons are strong versus everything the Zerg army except Brood Lords and perhaps mass Hydralisks. A few Tempests can protect against the Brood Lords, whereas a few Psionic Storms will deflect any Hydralisk attack. The Archons are great on offense as well when it is time to push out. While Tempests are somewhat slow and not particularly strong against Mutalisks (though they are not bad), they are very beefy, and Mutalisks will have to expose themselves to Archons and Psionic Storm if they want to try to take out a Tempest. Consider the Tempest to have an additional function: Mutalisk bait.

Another great thing about using Archons and High Templar is that they cost mostly gas. You can use your leftover minerals to build a lot of cannons at each of your bases to prevent Mutalisk and Zergling run-bys. These sneak attacks on your expansion are what makes Mutalisk play work in the first place against Protoss, so you can shut it down pretty quickly by getting a lot of Photon Cannons out.

Dealing with Mutalisks & Zergling Combos

While dealing with nothing but Mutalisks is easy with well-controlled Phoenix, things get a bit more challenging if the Zerg player mixes in a lot of Zerglings. Phoenix cannot do much about Zerglings. Void Rays actually do okay versus Zerglings. However, if you have a lot of bases to defend, a good Zerg will try to ignore the slower Void Rays and focus on rushing down your expansions or killing off your workers. In these situations, you need something on the ground that can efficiently kill Zerglings that also can handle its own against Mutalisks.

The perfect unit for this is the Archon. Archons are so strong versus Zerglings and have the added damage of dealing splash damage, allowing the Archon to kill multiple Zerglings at once. Archons are great versus Mutalisks too. Phoenix/Archon can roll over Mutalisk/Zergling without even trying. With Archon support, you only need a few Phoenix as well to take down the Mutalisks. You can hover your Phoenix over top of your Archons, and if your enemy's Mutalisks want to come in range to try to hit your Phoenix, they will have to take hits from the Archon. The game will not last long if the Zerg keeps making that mistake!

Archon/Phoenix/Void Ray is a very gas-intensive build. Use your extra minerals to build Photon Cannons at your expansions as well as to build Zealots. Zealots can be used to protect the more expensive Archons or be used in ninja attacks while your main army hits the main forces of the Zerg player.

Handling a Brood Lord Tech Switch

Sometimes, a Zerg player may have been using Roaches, Zerglings, and Hydralisks all game, then suddenly show up with 4-6 Brood Lords. You might not have time to switch over to a full air army. If you see a Greater Spire, it is not a bad idea to add in just 2-4 Void Rays into your mix of Protoss units, even if

you are using all ground units. Void Rays can use their Prismatic Alignment to burn down Brood Lords in just a few seconds. You do not need a lot of Void Rays to fill this purpose and they do not even need upgrades. Your Colossus/Stalkers/Sentries/Archons/Zealots/Immortals can handle any anti-air forces on the ground while your Void Rays focus down the important units.

Stopping Viper / Roach / Hydra

A common strategy in Heart of the Swarm is for Zerg players is to max out as quickly as possible Hydralisks and Roaches and try to overwhelm the Protoss player. This actually works fairly well since a Zerg can max out on Roaches and Hydralisks long before the Protoss player can max out on high tier units. Since Roaches and Hydralisks are good versus Gateway units, this does make the Protoss player vulnerable to such an attack.

The problem with this approach in Wings of Liberty is that the Protoss player could stall the Zerg's advance with Force Fields until a few Colossi got out on the map. A few Colossi with some Zealots and Stalkers to soak up damage and some Force Fields can easily stop a much larger Roach/Hydralisk army.

Enter the Viper. Its Abduct ability can be used to yank the Colossus from its safe spot in the back of the Protoss army right in range of the Roaches and Hydralisks, allowing the Zerg player to take them down instantly. With the Colossi out of the picture, the larger Roach and Hydralisk army can make quick of the remaining Protoss forces and march on to a swift victory.

The best solution to the Viper is to get out a few High Templar. As soon as High Templar are on the map, they can use Feedback to drain the Vipers of energy. A Viper with full energy will die to a single Feedback. A Viper with no energy cannot actually do anything. Since Vipers cost more than High Templar both from a resource count and a supply count, a High Templar that does nothing but use one good Feedback will actually be a good use of resources for the Protoss army. Templar can then morph into Archons after spending their energy.

Later in the game, Psionic Storm can be used as well. A few Templar can Feedback all the Vipers with their first bit of energy and then use the rest on Psionic Storm. Archons can then be formed.

Using Dark Templar as Emergency Support

If you are getting overwhelmed by a large Zerg ground army in the mid to late game, Dark Templar can completely turn the game around, especially if supported by Blink Stalkers or Phoenix. Overseers are the Zerg's detectors, and they are very easy to spot and kill. If you can snipe off the Overseer, the Zerg ground units have no way to stop your Dark Templar, aside from perhaps a well-placed Fungal Growth.

You could be down to 110/200 supplies and your Zerg opponent could be fully maxed out and you can still win the fight with Dark Templar if you are able to snipe the Overseer(s) that are present. Five Phoenix or a handful of Blink Stalkers can make short work of an Overseer if they focus it down. As soon as the detection is down, warp in a wave of Dark Templar. Hydralisks get 2-shot and Zerglings get 1-shot by Dark Templar. Four Dark Templar can burn through a maxed Zerg ground army in no time at all. The Zerg player will either pull out until they can get more Overseers (which gives you time to macro an actual army) or they will lose their entire army to your Dark Templar. Either way it is one way to turn a guaranteed loss into a possible win.

Using Dark Templar to Harass Expansions

Sending in Dark Templar to harass enemy expansions is an excellent strategy, especially if you are hitting multiple bases at once, defending a major Zerg push, or otherwise distracting the Zerg army with your main Protoss ball.

The biggest mistake Protoss players make when using Dark Templar to harass Zerg is that they spend too much resources on their Dark Templar, forgetting that Zerg players can generally afford to be less resource-efficient than Protoss players. Dark Templar are expensive. They cost 125 minerals and 125 vespene gas, so each one really has to cause some damage for it to be a worthwhile investment for the Protoss player.

Using 4 Dark Templar to snipe a Zerg expansion before the Dark Templar get taken out might seem like a victory, but if it is the Zerg's 5th+ base, it can hardly be called that. Four Dark Templar are 500 minerals and 500 vespene gas worth of resources. Even if they delay mining at a new expansion for 2 minutes, killing a 350 mineral Hatchery (300 for the Hatchery, 50 for the Drone) is not worth losing 500 vespene gas and 500 minerals worth of units!

As a result, you rarely want to use more than 1-2 Dark Templar to attack satellite expansions. You can afford to use more Dark Templar if warping into the main base, since taking out the Hive and other tech structures is more valuable than just killing off a satellite expansion.

A single Dark Templar can be a great way to harass a satellite expansion (i.e. the 4th+ base of the Zerg), but only if it is controlled properly. If you simply give the Dark Templar a "move" command into the base where you want to harass, when it gets there, it will attack the Queen instead of the Drones. Since a Queen can eat 4-5 Dark Templar swings (depending on upgrades) and will automatically run away from the Dark Templar, you will waste a huge amount of time if you do not manually command your Dark Templar to attack Drones.

Drones die in one hit to a Dark Templar. If the Drones are mining, the Dark Templar barely has to move as it goes from one to the next, killing one off with each swing. To put it in perspective, in the amount of time it takes the natural AI of the Dark Templar to kill an unattended Queen, you could have killed about

10 Drones. If the Zerg player does not pull their Drones, the Dark Templar will be able to clear out the entire Drone line in about 30 seconds.

To manually command your Dark Templar to kill Drones, select the Dark Templar, hold shift, and right click on as many Drones as possible in a few seconds. This will only divert your attention for a couple seconds while significantly improving the effectiveness of a Dark Templar harass.

A single Dark Templar starts paying off at the 5th Drone kill. This is just 5 swipes when you target Drones manually. By contrast, if you use 4 Dark Templar, you need to get 20 Drones kills before the attack really pays off. If you're going to use 4+ Dark Templar, you literally have to clear out the entire expansion worth of Drones plus the Hatchery to come out significantly ahead. At that point, it is usually cheaper (and a safer bet) to just use a wave of Zealots.

Terran Strategies & Match Ups

Terran is an easy race to play well but a difficult race to play extremely well. The strategies in this section should improve your mastery of this race.

General Terran Strategies

Below, you will find a list of general Terran strategies that you can use in any race match-up.

Late Game MULE Steal

Imagine a map that has 12 total bases. If you drew a line down the center of the map, there would be six for each player. While players can technically expand anywhere on the map, by the time you can control the map well enough to take an expansion on the opponent's half of the map, you have probably already won the game.

Everything you can do to waste or take the opponent's minerals adds up, especially if you control all the bases on your "side" of the map. One strategy used at the high level of play when you are starting to run out of minerals in the bases on your side of the map and you have a ton of leftover Orbital Command energy is to burn all of your energy to drop MULEs in the closest enemy's base (occupied or unoccupied). The MULEs will then harvest minerals from the enemy's side and try to return to your base with their cargo.

Even if the enemy player kills your MULEs, this is still an effective strategy, because each MULE grabs 30 minerals, permanently removing 30 minerals per MULE from your enemy's expansion. If you drop 4 Orbital Command's worth of energy, you will get 16 MULEs, each grabbing 30 minerals. This removes 480 minerals from your opponent's base permanently. If those MULEs make it back just once, that is 480 minerals bonus for you. If your opponent ignores this and the MULEs make two trips, which they can in their 90 second lifespan, this will permanently remove 960 minerals from your opponent's base and give you 960 minerals you would not otherwise have. This is a surprisingly substantial advantage. That is 38 Marines worth of resources!

Taking a Ninja Expansion

In a similar vein to the MULE mineral-stealing strategy is taking a ninja expansion. A "ninja" expansion is the term used to describe an expansion which is hidden or beyond the next logical expansion point. It is either hidden (large 4 player maps) or it may even be one of the "other player's" distant expansions.

The reason the ninja expansion works so well for Terran players is because it requires a lot less investment from a Terran player than it does for other races. Rather than fully saturating the ninja expansion, you can just use 1 Orbital Command, 6 SCVs, and 2 Refineries. You can put all the SCVs on Vespene gas and only use MULEs to harvest the minerals. If you have a lot of Orbital Command energy, you can quickly pay for this initial investment with a handful of MULEs. Even if you are detected a few minutes later, you have already profited from this expansion, particularly if it was on your enemy's side of the map.

A Zerg or a Protoss has to risk a lot more to take an effective ninja expansion. If there were 16 harvesters on minerals and 6 on gas, they would have to risk losing 22 workers and have no escape plan in the process. A Terran player only risks 6 SCVs. They can often save their Orbital Command when it is discovered just by lifting it off and flying it to safety.

Using Buildings for Scouting as Mech

With the release of Heart of the Swarm, it is very common for Terran players to go for full mech builds. Since these builds do not use any units that require a Barracks, a common strategy is to use your Barracks to scout your enemy.

You do not want to fly the Barracks right into the enemy's base, as it will get quickly taken out. Instead, just lift it off and fly it out over the map in between your base and your enemy's base to help provide a free scout to spot units and drops moving across the map. Your Barracks is actually fairly safe floating out across the map. After all, if the enemy is going for an early attack or drop, it will be significantly delayed if they stop and try to kill your Barracks, making the timing attack or drop not much of a surprise.

Trading SCVs for Orbital Commands in the Late Game

Even though Zerg and Protoss players constantly complain about how overpowered MULEs and the Orbital Command are, Terran players do not leverage this advantage nearly enough. In the late game, if you have extra minerals, you will want to make extra Orbital Commands inside your main base and even build extra ones at your expansions. This is ideal in situations where you are already maxed out, already have production facilities, and still have built up a bank of 1000+ minerals. The purpose of these is not to produce SCVs or to harvest an expansion but just to serve as an energy dump for MULEs and Scanner Sweep.

An Orbital Command can keep 1 MULE up with 100% uptime, and 1 MULE harvests as fast as 4 SCVs. A MULE carries 30 minerals at a time instead of 5 minerals an SCV carries. A MULE is only worth 4 SCVs (not 6) because the travel time between the Orbital Command and the mineral patch is the same for the SCV and MUL, which brings the MULE's effectiveness down to about 4 SCVs worth of harvesting. This

means each extra Orbital Command you build, you can throw away 4 SCVs and still get the same income. By “throw away”, I literally mean just kill them or sacrifice them. This would be in the late game when you are already maxed out.

By killing some of your SCVs intentionally, you free up more supply space. Imagine if you had a 200/200 bio army. Now imagine if you killed 20 of your own SCVs and built an extra 10 Medivacs and added them to the army. The army with 10 extra Medivacs is going to be a lot stronger and more resilient, despite the fact that your supply count is still 200/200. If you have 5 extra Orbital Commands, your income will not suffer at all, as the extra MULEs will make up for your missing SCVs.

Additionally, having some extra Orbital Commands means that you can Scanner Sweep any time you want and not have to worry about not having energy or missing out on resources from MULEs. You can constantly scan your opponent’s army so you never move into a bad situation blind.

Medivac Bomb

One advanced, sometimes effective, and very fun strategy is to create a “Medivac Bomb” using a Medivac and a Raven. What you can do is cast Seeker Missile on your own Medivac, and then when the Seeker Missile has locked on, you can use Ignite Afterburners on your Medivac and fly the Medivac into the midst of the enemy’s forces. When the Seeker Missile connects with your Medivac, the splash damage will hit the enemy’s forces. Normally, a good opponent will pull whatever units are targeted by Seeker Missile out of their main army to reduce splash damage. However, with this tactic, you are in control of the Medivac so you get to “aim” the Seeker Missile yourself.

In order to make this work, you have to wait until the Seeker Missile is up for a second or two so it can “lock on” to the Medivac. If you use Seeker Missile and send in the Medivac right away, the enemy might kill the Medivac before the Seeker Missile can get there.

Seeker Missile does not have a big range, but with this strategy you can extend your reach to 15+ yards.

Terran vs Protoss

Terran versus Protoss is a match-up that many players struggle with at the high level, but this does not need to be the case. Marines, Marauders, and Medivacs are better than any tier 1 Protoss ground units. Vikings can counter Colossi, while Ghosts can counter High Templar and Archons. Controlling Ghosts and Vikings to take down High Templar, Archons, and Colossi is a skill that will take practice. Once mastered, the Terran vs Protoss match-up will be much easier.

Handling Early or Proxy Oracles

When playing against Protoss players, a proxy Stargate (i.e. a Stargate hidden near your base rather than being built inside the Protoss player's main) into a fast Oracle(s) is an incredibly popular strategy. In fact, this is so common, you will rarely want to go for any build now that does not counter this type of play.

One of the keys to stopping this type of play is scouting information. By around the 4:45 mark, you should build 2 extra supply depots near the edges of your base, so you can spot the Oracles early before they get to your mineral line. This will give you time to move your Marines or Widow Mines into a defensive position.

You need 5 Marines for each Protoss Oracle. At the top levels, Protoss players will have an Oracle in your base somewhere between the 5:30 and 5:40 mark, depending on the size of the map and how close the proxy Stargate is located to your main, with a second one arriving by about 6:00-6:10 (depending on Chrono Boost usage). In leagues below Master's, this will be slightly slower, with the time of the Oracle appearing a few seconds later each time you drop a tier of competition. You likely will not see the first Oracle in your base until 6:00+ in Bronze league.

The key to countering this particular opener is to master a Marine-heavy early expand build. A step-by-step copy of an effective build is included in the build orders section of this book. An alternative solution would be to get out early Widow Mines in addition to Marines. This allows the Terran player to be more aggressive early in the game. Both are effective options though so unless you are playing a series of games you only need to master one of these openers. The two are not necessarily mutually exclusive either, as you can go from a Marine-heavy early expand build into supplementing your army with Widow Mines. The transition is natural.

In high Master's and Grandmaster's Leagues, Protoss players will simultaneously try to thin out your Marine count with well-microed Stalkers in order to make their Oracle attack more effective. Getting a Bunker (or two – one Bunker for each Protoss Warp Gate is about right) at the entrance to your natural is crucial for preventing Stalkers from whittling away your Marines. This will also help protect you from Warp Gate / Void Ray / Oracle all-ins, which are a common reaction to a failed initial Oracle harass. If you deflect the proxy Oracle early, the Protoss player is far behind due to only being on one base.

If you actually find the Stargate after it has been proxied, you **must build a Bunker beside it** in order to take it out. If you just send a few Marines over and try to hit the Stargate, the Protoss player will make their Oracle anyway while sending over a Stalker or 2 to clean up the Marines. Unupgraded Marines without Stim have no chance against a well-microed Stalker, even when the Marines outnumber the Stalkers. Since a few Marines cannot kill a Stargate easily, what will happen is the Protoss player will make their Oracle anyway, it will finish, and go into your base and attack. Worse, you will be down the few Marines you lost to the Stalker, so you have less to fight off the Oracle with when it finally arrives.

It does not help that Oracles are strong versus small numbers of Marines. Get 2-3 Marines in a Bunker though and the Stargate is guaranteed to be taken out. It does not require that much investment either, so you should have plenty of Marines or a Missile Turret at home to deflect the Oracle once it pops out should the Protoss player ignore your Bunker. Once the Stargate goes down, you can salvage the Bunker to get 75 minerals back.

Using Hellions to Counter Proxy Oracle

One weakness of the proxy Oracle is that the Protoss player becomes very susceptible to Hellion attacks. Normally, Terran players do not bother trying to use Hellions against Protoss because the Sentry can Force Field the ramp and Stalkers in general are very strong against Hellions. The Mothership Core does not help matters much.

However, Protoss players who go for early Oracles never have the gas they need to have out a significant ground defense and are very vulnerable to Hellions in the early game. They may have a single Sentry or a few Zealots, both of which are weak against ~4 Hellions. The reason is that a Stargate costs 150 vespene gas, Warp Gate technology costs 50 gas, Oracles cost 150 gas each, and the first Stalker or two the Protoss player typically gets out is used to help aid the harass by attacking the front door while the Oracle hits the back mineral line tack on another 50 gas a piece. There simply is not enough gas to go around for the Protoss player to have a Mothership Core or multiple Sentries/Stalkers at home to defend. Stalkers are fast, but Hellions are much faster. You can easily slip a few Hellions by a Protoss that is using their initial Stalkers on offense.

The end result is that a Protoss player that uses a Proxy Stargate to make Oracle(s) is very vulnerable to a few Hellions. Run them right into the main if possible and take out as many Probes as you can before the Hellions go down. A well-microed Hellion harass can often result in more worker kills than the Protoss will net with their Oracle(s). The best part is that your attack cost no gas, while the Protoss had to invest significant amounts of vespene to perform their Oracle harass.

How to Handle Stalker + Mothership Core + Oracle Attacks

The better the player is, the stronger the Oracle becomes. The reason for this is that rather than just proxying or rushing to the Oracle, a good Protoss player will simultaneously back up their attack with Stalkers and the Mothership Core. Stalkers and the Mothership Core dominate unupgraded Marines as well as Hellions. Stalkers have a range advantage and are faster than Marines, so with good micro a couple Stalkers and a Mothership Core can take out Marines without support (and you cannot have much support out that early in the game).

The idea behind this attack is to thin out Marine numbers and apply pressure on the Terran base, preventing the Terran from investing in tech or Missile Turrets. While distracted by this attack, an Oracle or two comes in from the side and starts tearing up the mineral line. If there are not enough Marines, two Oracles can even be used to kill the remaining Marines, allowing the Stalkers to enter the main base, ending the game in a win for the Protoss player.

The best answer to this aggression is the Widow Mine. A Widow Mine will 1-shot an Oracle or a Stalker, despite costing significantly less than either of the latter units. Even if your Widow Mine only goes off once, it will have paid for itself.

Two Widow Mines can be used to cover the entire mineral line. Just central to each Refinery is a good location, as this will cover all the avenues the Oracle has to attack you. Make sure there is no overlap between the two Widow Mines' attack ranges. Widow Mines will deal splash damage to friendly units, but this is only 40 damage. SCVs have 45 health, so as long as you do not let your SCVs get hit by two Widow Mine attacks, you do not have to worry about losing workers to the Widow Mine's attack.

Put a few more Widow Mines by the front of your base, particularly on the ramp. Each Widow Mine can kill a Stalker. Since Widow Mines train faster than Stalkers and cost significantly less resources, you should have no problem pacing Widow Mine production to keep up with Stalkers. If you want to grab your natural expansion, a single Viking or Siege Tank is all you need. A Viking can be used to take out the Mothership Core (or at least prevent it from getting vision of the high ground), while a Siege Tank will push Stalkers back so you can leap frog your Widow Mines into a forward position.

Once you have deflected this attack, there are several options you can perform. One good choice is to scoop up some of those extra Widow Mines that you made to fight the Oracle and Stalkers, then drop two in the Protoss natural and two in the Protoss main. Another option is to build a second Orbital Command from the safety of your main base, then when you have enough units to break the contain, push out and grab your natural.

Terran in the Mid/Late Game vs Ground-Based Protoss

In Terran vs Protoss, there are a lot of options, but in the mid to late game, the Protoss player inevitably will use a large combination of Zealots, Stalkers, Sentries, and possibly Immortals, all backed up by either Colossi or Archons/High Templar or even all three.

The good news is that Terran ground forces (Marines, Marauders, Medivacs, and Hellbats) will counter all Gateway units as well as Immortals. With the introduction of Heart of the Swarm, this is even more pronounced, as Hellbats absolutely decimate Zealots, even when the Hellbats lack upgrades. However, these Barracks and Factory units are weak against the Colossus, the Archon, and the High Templar. How can these high tech Protoss units be handled?

Many Terran players mistakenly think that the Protoss deathball is unstoppable once it forms, but fortunately, the solution for countering such an army is actually fairly simple: Ghosts and Vikings. Ghosts can counter High Templar and Archons via Snipe and EMP respectively. Each EMP drains 100 shields away from the Archon, so an Archon can literally be drained to virtually no health via a few EMPs. Vikings on the other hand counter Colossi. The flip side of this is that Vikings are weak against Archons and High Templar while Ghosts are weak against Colossi. You need to have the perfectly balanced army here to gain an advantage as Terran.

If you have the right composition to counter your opponent, you will have an advantage as Terran. If there are Colossi, get out 3 Vikings for each Colossi. If there are Archons, get out 2 Ghosts for each Archon. If there are High Templar, get out 1 Ghost for each High Templar. In the late game, you should have plenty of energy available for Scanner Sweep, so you can actually check out your opponent's forces and tailor-make your army to counter theirs. The key here is balance. If you have 12 Vikings out and the opponent does not have any Colossi, you are in trouble. If you only have Ghosts and the Protoss player has Colossi, you are in trouble.

If you have the right army balance, it just comes down to your micro. A good Protoss player will try to use Feedback on your Ghosts and try to use Blink Stalkers to snipe your Vikings. You need to Snipe the High Templar with your Ghosts before they can Feedback you. Cloak makes this much easier. You can use Scanner Sweep plus your Vikings to pick off the forward Observer, then sneak in with your cloaked Ghosts and pick off all the High Templar. Even if new High Templar get warped in, they will not have the energy they need to use Psionic Storms.

You will also need to use your Vikings to pick off the Colossi the best you can. If there are too many Stalkers on the field, a good Protoss will manually target down your Vikings. In this situation, you will have to play a bit of cat and mouse with your opponent so that your Vikings can get a good angle where the Vikings can hit the Colossi but the enemy's Stalkers cannot get into a position to hit the Vikings. Vikings can fly and have a range of 11, so this is possible. The best locations tend to be over top of empty space or walls that Stalkers cannot Blink to reach. This often provides the Vikings with a safe spot to attack the Colossi with nothing the Protoss player can do about it but retreat.

If you have the right army balance, it just comes down to your micro, especially with the Ghost. Terran players that fear Protoss in the late game are the ones who never like to make Ghosts. Yes, Ghosts do require micro. Yes, they require a lot of Barracks and Tech Labs to make in large quantities. Yes, getting out a Ghost Academy plus Personal Cloaking is expensive. However, you cannot beat a Protoss that is using their full range of units without using the full range of your own units. You need Ghosts to readily defeat Archon/High Templar builds. You can get away with avoiding Ghosts if there are just a couple Archons or High Templar on the field, but when you see 4+ Archons, you must get Ghosts (or air, as discussed below).

If you are wondering why Terran does not win every PvT, it is because if the army balancing is not perfect from the Terran, the encounter strongly favors the Protoss. If the Terran has too many Vikings but not enough Ghosts, the Protoss player will win due to Archons and High Templar. If the Terran has too many Ghosts but not enough Vikings, the Protoss player will win again. Meanwhile, for the Protoss player, there is no such thing as too many Archons or Colossi – both of these units deal a ton of damage. After they tear through the Terran ground army they will quickly kill off workers and infrastructure. Ghosts and Vikings on the other hand are not nearly as threatening on their own!

Terran Air vs Protoss

In the late game, Terran air can actually be quite good versus a Protoss player, particularly a Protoss player who is light on the anti-air. In particular, the combination of Battlecruisers, Vikings, and Ravens is particularly deadly. If you surprise the opponent with such a switch or have an upgrades advantage, it is very difficult for the opponent to do anything about.

The reason is that the Battlecruiser is good against literally every unit the Protoss player has to offer on a supply for supply basis except for the Tempest. Battlecruisers even do well against Void Rays with Prismatic Alignment active, particularly if the Battlecruisers have an upgrade advantage. Battlecruisers destroy Stalkers, Sentries, Phoenix, Archons, Carriers, as of course any Protoss unit with no anti-air attack. Battlecruisers have so much health that they barely notice the effects of Psionic Storm or even Feedback. The only thing that kills a Battlecruiser easily is the Tempest's attack.

Stopping Tempests from Destroying Your Battlecruisers

Players are often reluctant to use massive air units against Protoss players given how good the Tempest is against these units. However, Terran have one thing that the other races do not that allows them to use Battlecruisers even against the Tempest: Point Defense Drone. Tempests attack so slowly that it takes them forever to drain a PPD of energy. The only way Protoss players can quickly drain the energy from these is with the High Templar's Feedback spell, but you will not see this counter until the very top

levels of play. If the Protoss player is using Feedback on the PDDs, this means there is less energy for Feedback on Battlecruisers and Ravens and for Psionic Storm, so this is not a huge loss. Templar also place themselves in vulnerable positions when using Feedback, allowing Ghosts to snipe them.

With PDDs in place to protect your Battlecruisers, you can slowly push forward and use your Vikings to pick off any Tempests. You will want 2 Vikings for each enemy Tempest for best results.

The Other Tempest Barrier: The Protoss Player

Another thing to consider about the Tempest is that it takes a lot of time and resources just to get them out on the field. A lot of Protoss players will be focused on ground upgrades, High Templar, and Colossus technology. If the Protoss player even has a Stargate on the field, they likely only have 1-2 Stargates from an Oracle opener. Tempests also require a Fleet Beacon (60 second construction time) and the Tempest itself requires 60 seconds (40 with a double Chrono Boost). The end result is that even if your Protoss opponent goes straight for Tempests after spotting a few Battlecruisers, you will have a few minutes of Tempest-free time to attack before they even get a Tempest on the field.

If you already have a lot of Vikings, it might be too late for the Protoss player to get enough Tempests to even stop your attack. You can make sure this is the case by dropping 4 Marauders in the Protoss player's base and picking off the Starport and Cybernetics Core, preventing Tempests from appearing on the map for 5+ minutes!

Using EMP on Your Own Battlecruisers

If the enemy player is using High Templar, you can use EMP on your own Battlecruisers to drain their energy before going in for an attack. This will prevent the Battlecruisers from taking damage from Feedback. If you do not have Yamato Cannon researched, there is no downside to this approach, as there is nothing to spend your Battlecruiser's energy on anyway.

Getting Ship Upgrades before the Swap

One thing that makes a SkyTerran switch more effective is having an upgrades advantage. Namely, Terran players typically research Ship Weapons upgrades no matter what, because Vikings are heavily used in TvP. Meanwhile, Protoss players almost never research air upgrades in TvP, because they rarely use air units in the late game (Oracles do not benefit from +ship weapons).

The reason this fact is so important is that PDD aside, 3/3 Vikings will handily beat 0/0/3 (shields) Tempests in a supply-for-supply basis (i.e. 2 Vikings to 1 Tempest). On the other hand, 3/3 Vikings are just evenly matched against 3/3/3 Tempests, with the Tempests winning smaller engagements and the Vikings tending to win large engagements (due to Tempest overkill).

Even if the Protoss player scrambles and gets out a few Tempests when you swap to air, if you have the upgrades advantage, your SkyTerran swap will only become more effective.

Why Doesn't SkyTerran Win Every Game?

When described this way, it might sound like Battlecruiser/Viking/Raven combination should be winning every Terran vs Protoss game. However, most games never go on long enough for Terran players to make this a reality, as this strategy requires money, time, and upgrades. Battlecruisers cost 300 Vespene gas a piece. Ravens cost 200 vespene gas. Upgrades, which Battlecruisers need to work, cost vespene gas. A 0/0 Battlecruiser does not do nearly as well against a 3/3/3 Stalker as would a 3/3 Battlecruiser. Getting out 4+ Starports with Tech Labs and a Fusion Core is expensive.

The point is most games never reach the point where the Terran can max out, stabilize, and bank up enough resources to make a clean switch into SkyTerran. This is a strategy that really requires 4+ bases in order to fund. It is a strategy you should be aware of in case you find yourself in a late-game stalemate with a Protoss player. However, considering you have to bank up a few thousand gas to neatly make the switch, it is not something that you will end up doing in every game.

Terran vs Terran

With the release of Heart of the Swarm, Terran vs Terran is a dynamic match-up with a lot of viable strategies. The most important thing to understand about TvT is that in any ground-based engagement, Siege Tanks are king. **Whichever side has more Siege Tanks usually wins in TvT.** If there was a chart that showed the number of Siege Tanks produced in a TvT versus win-rate, we would see a direct correlation. You can never have too many tanks in TvT!

Dealing with Early Widow Mines

A single early Widow Mine drop can actually be killed by SCVs if you are *extremely* quick. As soon as the Widow Mine pops out of the Medivac or runs into your mineral line, grab 6 SCVs and attack it while it is burrowing. If you can pull this off before the Burrow command is given, you can actually kill the Widow Mine before it can burrow and attack.

In TvT, it is popular for players to open with a 1/1/1 build in order to drop two Widow Mines (along with gas-free units – typically Marines). Players use two Widow Mines because Widow Mines deal 40 splash damage but SCVs have 45 health – therefore you need two explosions to take down a large number of SCVs. If you can kill off one of the Widow Mines with workers as soon as it drops, the second Widow Mine drop will only net a single kill.

Other races are not able to use workers to kill burrowing Widow Mines because if the Widow Mine does manage to burrow, the splash damage will kill a large number of workers, as Drones and Probes only have 40 HP. It is much safer to do this as Terran.

Handling Proxy Reapers

After the change to Reapers with the release of Heart of the Swarm, opening with Proxy Reapers is one of the most popular strategies on the ladder. It is easy to execute and can be quite effective even at the high level.

There is however a reliable way to deal with this strategy. First off, due to the prevalence of Proxy Reaper, in most situations, it is inadvisable to go for a Command Center first build. Instead, you will have more success in TvT by getting out a Factory early in order to get access to Hellions and Widow Mines, as well as Starport technology.

You cannot take down an enemy Reaper with a single Marine. It just does not work. You can deflect a single Reaper with two Marines for some time, but eventually the Reaper will wear down the two Marines. Additionally, if the Terran opponent is going for a true proxy Reaper build, you are likely going

to eventually see a total of 3-4 Reapers. Once 3+ Reapers get out on the field, Marines are no longer a viable defense, as 3 Reapers can come in, pick off 1-2 Marines, back out and heal, and repeat this process. All the while, the number of Reapers will continue to increase, while the number of Marines will not. Eventually you will get overrun.

Instead, you need to get the real challenge becomes getting to up to Factory tech before you get overwhelmed by enemy Reapers. If a Reaper appears in your base before the 3:30 mark, as soon as the first Reaper appears, you need to pull 3-4 SCVs up to chase it down. Each time an SCV gets low on health, send it back to the mineral line. If the Reaper gives chase to the fleeing SCV with low health, you can position a Marine in between the SCV and the mineral line and it will not be able to give chase. If a Bunker goes up inside your base, you need to pull 4-5 SCVs to attack it.

Do not be coy about using your SCVs to help defend off a proxy Barracks/Reaper play as you work towards a Factory. Even though you are pulling SCVs to handle this threat, you have to remember that your opponent has sacrificed both economy (in the form of cut SCV production) and technology (since Reapers cost gas) to get out early Reapers. If your opponent proxies Reapers and only gets a few SCV kills, you are incredibly far ahead in the game. If you have 15 SCVs and pull 5 to deal with Reapers, your economy is noticeably better than a player who only has 8 SCVs!

You may think that the downside to opening with a fast Factory in this manner is that if your opponent expands early and never actually gets Reapers, you took this precaution for nothing. Fortunately, throwing down a Starport after your fast Factory gives you the opportunity to attack with an early 1/1/1 build, as discussed in our builds section of this book. If your opponent goes for an expansion-first build, you can likely kill them outright (or at least inflict a huge amount of damage) with this offensively-oriented 1-base opener.

Once you have a Hellion out, Reapers are no longer a threat. A single Hellion can take down multiple Reapers, and is fast enough that it will not get kited around by them easily.

Don't Overreact to a Late Reaper

While you need to be aggressive when dealing with very early Reapers, you need to be careful about overreacting to a late Reaper. Proxy Reapers are going to hit your base by 3:30 at the latest in order to be effective. If you see a Reaper before the 3:30 mark, defend against it in the manner as described above.

On the other hand, a Reaper that comes at 4:30 or later is not likely actually a real attack. It is just designed to provide the enemy Terran player with scouting, to annoy you and deflect your attention, and to keep you honest (i.e. forces you to spend some minerals on offensive units rather than just economy and tech).

In these situations, you can deflect the single Reaper with just two Marines until you get a Hellion out. Regardless of whether or not you go for a fast expansion or a 1-base timing attack, getting out two Marines early is a good practice in Terran vs Terran match-ups. Two Marines can deflect any exploratory Reapers. Even if the Terran player does not produce Reapers, your two Marines are still useful to stop an enemy SCV or Marine from poking up your ramp and getting a free scout.

Just remember not to pull SCVs to attack a Reaper if the Reaper is coming in at the 4:30 mark or later. If you start pulling SCVs to deal with an exploratory Reaper, you will definitely fall behind. Remember it is okay to pull SCVs to handle an early Reaper, because your opponent has sacrificed their economy to get out a Reaper so quickly. On the other hand, they have barely sacrificed anything in order to get a Reaper out at the 4:30+ mark, so you cannot let it reduce your mining at all.

The caveat is that sometimes Terran players may horde 3-4 Reapers to try to take you by surprise. If this is done by proxy, you would have noted something was off simply by scouting and seeing no buildings, cut SCV production, and early gas at the enemy Terran's main. If you see something like this, you can rush to Factory tech to get out a Hellion. You will be so far ahead by the time the Reapers show up that the game is practically over. If the enemy does not proxy and hides their Reapers in their main, you should be able to get out a Hellion or two before the attack hits – it will be too slow.

Defending the Natural Expansion from Early Hellions

You can shut down practically any incursion from Hellions into your natural expansion by plopping a single Widow Mine down at the choke point to your expansion. Once it goes off and takes down a Hellion, the enemy Terran player is all but guaranteed to pull back, given they do not know if you have another Widow Mine hidden somewhere. Losing a few Hellions early can make a player very vulnerable to counter attack, so good players are leery about losing Hellions within the first 7-8 minutes of a game.

Even if the Terran enemy uses a scan to expose your Widow Mine and kills it, this is still a solid gain for you. A MULE is worth 270 minerals worth of harvesting, and the Widow Mine should get 1 Hellion kill (plus damage any nearby Hellions). A 75 mineral 25 vespene gas Widow Mine getting a 100 mineral kill, doing some supplemental damage, and costing the enemy Terran an early MULE is trade that benefits you every time.

Scouting in Early-Mid Game TvT

Once the enemy Terran has walled off the entrance to their main base and perhaps placed a Widow Mine or two to defend their natural expansion, you can no longer run an SCV, Marine, or even Hellion into the enemy base to figure out what the enemy player is working on producing. As mentioned in the previous section, using scans is not ideal in the early game, as a MULE can harvest 270 minerals in its

lifespan. Each scan you use is 270 minerals that you are not spending on more Orbital Commands, SCVs, or offensive units.

By about the 6:30-7:30 mark, you will want to try to get a full scout off on the opponent's production facilities and tech choices to see what sorts of things they are building, what upgrades they are getting, whether or not they are gearing up for a timing attack, if a third Command Center has gone down, and so on.

There are two ways you can efficiently go about getting this information. The first is getting a Reaper and using the Reaper to hop up the side of an enemy's base, not trying to attack any enemy units but just scouting every inch of the base. This tends to provide the most information and allows you to scout the entire base, but it can be shut down by a well-placed Widow Mine. It is harder to execute on maps where the main is "two levels" up, such that the Reaper has to jump up into the natural expansion before it can get into the main. Good Terran players typically position their units to intercept scouting Reapers attempting to use this strategy.

The Reaper scout also has the disadvantage of costing gas. Players may not want to spend this gas on scouting in the early game and instead use it for faster tech. If you are teching up and want to work off Factory and Starport units, one good solution is to lift off your starting Barracks and fly it into the enemy's main.

Typically Terran only have a handful of Marines in the early stages of the game, so it will take them forever to kill off a Barracks. Hellions, Reapers, and Marauders cannot hit flying structures and Widow Mines do not target structures, so this Barracks will often live long enough to get a full scout off on the enemy player. For best results, you can even save this Barracks by pulling it out when it gets to 700 HP or so, then send it back in to scout again after about a minute. This will help prevent you from getting duped by tech switches after the scout – a common strategy in all mirror match-ups.

Deflecting the Early Cloaked Banshee

If you see a Starport go down with a tech lab during your scout at the 6:30-7:30 mark, prepare for a Banshee. When scouting using the Reaper or Barracks strategy mentioned above, you need to check whether or not the Tech Lab attached to the Starport is researching anything. If it is, you are likely going to see cloaked Banshees.

In order to handle cloak, you need to get down 1 Missile Turret in each mineral line along with 1 Viking total. The Missile Turret will provide detection beyond its range, and the Viking can take down the Banshee while using the Missile Turret's detection. If the Banshee(s) tries (try) to kill off your structures while cloaked (i.e. avoiding the Missile Turret), just let the Banshees go ahead and do that. They will run out of energy shortly so you can use your Viking to clean them up or chase them away.

Players who are not very highly ranked (i.e. not in the Master's league or higher) may benefit from simply working in an Engineering Bay and 2 early Missile Turrets (one in each mineral line) into their TvT build. Typically your opponent's macro will not be polished enough for you to fall behind significantly by investing in Missile Turrets in the early game. This will help deflect Widow Mine and Hellion drops as well, common strategies in TvT.

If you are already highly ranked (i.e. Master's or better), if no cloak is being researched, do not overreact to the Starport with a tech lab. It is possible that a Raven may be what comes out of the Starport anyway – it may not even be a Banshee! Investing in an Engineering Bay, 2 Missile Turrets, and 1 Viking is a large investment in the early game. If no cloaked Banshees are coming, you do not want to put all this money into this early infrastructure. If you are playing at a high level and dump that many minerals into automated defense before the 8:30 mark, you are going to fall slightly behind of an opponent who decides to go for a macro Orbital Command!

One way top tier Terran players can balance the risk of not getting any Missile Turrets versus wasting too much money in the early game by getting them (only for to go unused when a Raven instead of a Banshee pops out of the enemy's Starport) is by working the Engineering Bay into their build, but not the Missile Turrets. From here, they only build Missile Turrets once Banshee(s) or Medivacs appear on the map.

This is beneficial for a variety of reasons. First, it means that you do not actually have to react to just seeing a Starport with a Tech Lab, you can continue with your pre-determined build. Since you know from reading this book that having a pre-determined build will significantly improve your macro efficiency and free up more mental resources so you can attack your opponent and deflect attacks, this is not only a safe way to go but will elevate your overall play in general. The peace of mind is worth the 125 minerals, as the amount of mental space freed up by not having to worry about whether or not cloaked Banshees are coming can allow you to focus on inflicting more damage on your opponent or pushing your macro beyond what your opponent is doing. Either of these advantages can more than make up for a 125 mineral investment.

Getting an Engineering Bay out regardless also protects you from missing the cloaked Banshee. Maybe the Starport was hidden and you never noticed it. Maybe you were just denied scouting information. Either way, if a cloaked Banshee shows up and you do not even have an Engineering Bay out yet, you are in huge trouble, as the Banshee can be used to constantly pick off SCVs that try to make an Engineering Bay. This is practically an automatic loss for the surprised Terran player. On the other hand, if the cloaked Banshee shows up and you have an Engineering Bay, you can throw down a few Missile Turrets at each base. You will lose a few SCVs in the process but a few of the turrets will survive until completion, allowing you to stop the enemy attack. This is usually a draw (or even to your advantage) given how much a cloaked Banshee costs.

Getting 1-2 Missile Turrets in each of your mineral lines is actually not a bad idea no matter what your opponent is doing. Drops are a big part of Terran vs Terran any time after the 7:00 mark, so Missile

Turrets help a lot in this regard. A Missile Turret or two will also help defend against Widow Mine drops, as the detection will make taking out Widow Mines easy.

The key is not rushing to get these Missile Turrets out by cutting SCV or Command Center production. To clarify, if you delay your third Orbital Command to get down an Engineering Bay and 2-4 Missile Turrets at the 7:00-8:00 mark, and your opponent never drops or uses Banshees until the 10:00 mark (or later) in the game, you macro is delayed but you never actually realize the benefit of rushing to get those turrets out.

It is completely acceptable however to cut SCV and Command Center production to get out some fast Missile Turrets if you see cloak being researched. Remember that Banshee cloak costs 200 minerals and 200 vespene gas and a single Banshee costs 150 minerals and 100 vespene gas. Spending 325 minerals and no gas on an Engineering Bay and 2 Missile Turrets to completely shut down a cloaked Banshee is a big win when the opponent has to spend 350 minerals and 300 vespene gas just to get out 1 cloaked Banshee.

The easiest way to deal with Banshees without cloak is to get out a Viking (or 3). Banshees cannot hit air units, so this is an easy win for your Viking with minimal investment. Vikings are a great unit in Terran vs Terran anyway, so it does not hurt to get a few out in the early game to gain air superiority.

Placing Widow Mines in Drop Lanes

An excellent way to get a leg-up in TvT, particularly early in the game, is to burrow 2 Widow Mines in the “drop lanes”. If you mentally draw a straight line from your opponent’s production facilities to wherever your opponent would be most likely to want to drop (typically in the unoccupied portion of your main), you have the Drop Lane. Find a convenient spot to burrow 2 Widow Mines along this drop lane and you will find yourself regularly intercepting fully-loaded Medivacs on their way to drop off units in your base.

This is particularly common early in the game when timing is a huge issue. Players tend to cut right across the map in order to get their drop off sooner before the enemy player has enough units or turrets to easily deflect this attack. The dropping Terran player does not care if the other Terran scouts their drop, because it is coming so early on in the game that they would rather have it scouted ahead of time but land 20 seconds faster than have it not scouted ahead of time but have the drop land 20 or so seconds later by going along the outskirts of the map.

If your opponent has Medivacs out, take advantage of this by placing 2 Widow Mines in the high-traffic areas between your base and your opponent’s base. You need to use 2 Widow Mines since a Medivac has 150 HP and cannot be killed by a single Widow Mine explosion. Additionally, do not plant your Widow Mines within range of the Xel’Naga tower. Find a spot along the Drop Lane that does not have vision from a Xel’Naga tower. Enemy players typically avoid flying over Xel’Naga towers they do not control given that it is highly likely that you would have a unit there!

I have seen many pro-level games where players loaded up a full Medivac, boosted it right across the map to their opponent's main, only to fly over 2 strategically placed Widow Mines, losing the entire Medivac and all the units inside without getting a bit of damage done. This is extremely devastating should it occur before the 10:00 mark and leaves the Terran that lost the Medivac vulnerable to counter attack.

This strategy has the added advantage of strongly discouraging drops. It can really get inside a player's head if they have to tread carefully across the map to try to avoid Widow Mines. This strategy also frustrates enemy players, and frustrated players are much more likely to make mistakes.

Killing Widow Mines without Detection

An excellent way to kill a Widow Mine without wasting energy on Scanner Sweep is through making creative use of the Hellion's splash damage. When you attack something with the Hellion, any enemy unit within the flamethrower's range will take damage. This applies to burrowed and cloaked ground units, including the Widow Mine.

This knowledge is particularly useful when an enemy burrows a Widow Mine in your mineral line. If a Widow Mine is burrowed in your mineral line close to a Refinery or the Orbital Command Center, you can position your Hellions so that the enemy's Widow Mine is in between your Hellion and your own building. You can then command your Hellion(s) to attack the Refinery or Orbital Command. If the flamethrower from the Hellion passes over top of the enemy's Widow Mine, the Widow Mine will take damage. You can actually kill the Widow Mine this way without ever needing to reveal it with Scanner Sweep! There is no friendly fire damage here, so you do not have to worry about your workers getting hurt in the process. Buildings also take very little damage from Hellion attacks so there is little harm from having your Hellions attack your own buildings in this manner.

You can also use this strategy to kill Widow Mines even when you have no nearby structures to target by using a beefy unit like a Siege Tank or Thor. These units can handle a lot of Hellion shots and will barely take any damage in your effort to kill a Widow Mine. Form a line with your Siege Tank or Thor, the enemy's Widow Mine, and your Hellion(s). The enemy's Widow Mine should be in the center. Then, have the Hellions attack your own Thor or Siege Tank. The enemy's Widow Mine will quickly die.

Bio vs Mech vs BioMech – Mid to Late Game Strategies in TvT

When you make it past the initial drops, Reapers, and Banshees that typify the early game, Terran games can easily turn into macro games. Siege Tanks can turn things into a stalemate very quickly. In these late game scenarios, there are several options you have for how to play out the match.

Army Composition

There are 3 primary options for mid-late game Terran armies: full bio, Bio Mech, and Mech. Bio builds would consist of Marines, Marauders, and Medivacs. Bio Mech typically involves mostly Marine, Medivac, and Siege Tank. Mech builds rely primarily on Siege Tanks and Hellbats/Hellions, with the possible addition of a few Thors. All builds may incorporate Vikings to provide vision for Siege Tanks (or to stop the enemy player's Vikings/Medivacs). Note that Widow Mines are not common in late game TvT as part of the main army in any build because Siege Tanks typically prevent them from getting close enough to burrow and actually do anything. They still work good to gain map control, defend your bases, block drops and to use to harass.

Full bio has the primary advantage advantage of mobility. It is rarely used in the late game because once there are a lot of Siege Tanks and Vikings on the field, they are practically obsolete.

Any ground-based TvT comes down to the number of Siege Tanks and the positioning of the engagement, even in Heart of the Swarm. As a result, I strongly recommend not going for bio-based builds and instead focusing on Siege Tank and mech play. If you always seem to lose to bio when using tanks, you just need to execute it better. Here are some tips and strategies:

Countering Bio as Terran with Mech

If you are getting beat by Marauders and Marines as a Terran player and you are using Siege Tanks, there is a big problem. Once you have a couple Siege Tanks up in Siege Mode, there is really nothing that Marines can do to stop them. If you are losing to Marine/Marauder, your Siege Tanks are just getting caught out of Siege Mode. In the late game, you need to use Scanner Sweep (you should have multiple Orbital Commands) and your Vikings to scout around an area before moving your tanks. Your tanks should never be caught of position because you should never be moving them forward unless you know it is absolutely safe. You do not always have to leap frog your tanks (as this is really slow) – you can just scout all around the tanks and when you know it is safe, you can move them forward. In the late game you will likely have a lot of extra Scanner Sweep energy, so do not be shy about using it.

Bio armies that are very heavy on Marauders can do okay versus Siege Tanks, especially when the Marauders are spread out and when you consider the low gas cost of the Marauder. The key to stopping a Marauder-heavy army is through the use of the Point Defense Drone. PDDs can absorb 20 Marauder shots a piece, so just a few PDDs will shut a pack of Marauders down long enough for Siege Tanks to thin their numbers enough.

Hellbats also do well versus Marine and Marauders. While it may not seem this way since Marauders can kite Hellbats, your Hellbats function is really just to provide a vespene-gas free shield for your Siege Tanks. If you use Hellbats to escort your Siege Tanks, any time the enemy wants to attack the Hellbats,

they are going to take a ton of damage to the Siege Tanks. The Hellbats purpose is to prevent stimmed up Marauders from running in and picking off your tanks quickly.

Strategies Against Bio Mech

Bio Mech builds primarily consisting of Siege Tanks, Marines, Vikings, and Medivacs were extremely popular in TvT in Wings of Liberty. While such a build is effective in the early-mid game of TvT and all game against Zerg players, this bio-mech style of play really lacks effectiveness in late game TvT.

The reason for this is that Bio Mech used to be so good is because if you massed Siege Tanks and Vikings, you would end up with a lot of extra minerals. The minerals needed to go somewhere, and Marines made the best mineral dump. Marines would help absorb some damage and could also pick off wandering Vikings, Banshees, and Medivacs. Players were not going to use all their minerals anyway, so Marines made the perfect mineral dump.

With the introduction of Heart of the Swarm, the Hellbat has changed this. The Hellbat makes a better meat shield for your Siege Tanks. Marines would die in 2 hits to a Siege Tank. Hellbats need to be hit 4 times to die versus a Siege Tank. This may seem about even at first glance due to the fact that Hellbats are twice the cost of Marines. However, due to the smaller unit size, Marines are more clustered together than Hellbats, so a single Siege Tank blast often hits many Marines but only 1-2 Hellbats. The end result is that 5 Siege Tanks in Siege Mode would likely destroy 50 Marines, but 5 Siege Tanks in siege mode do not stand a chance in taking out 25 Hellbats!

Again, this is not saying that Bio Mech cannot work – it is just that for a similar supply/resource investment, a Hellbat/Siege Tank/Viking army is stronger than a Marine/Medivac/Siege Tank/Viking army. Hellbats also benefit from sharing upgrades with Siege Tanks and air armor.

If your opponent has a large Marine/Medivac contingent with their Siege Tanks and Vikings, just spend the resources you save from not making Medivacs to get out more Siege Tanks and Vikings. Dump your leftover minerals into Hellbats. If you have Viking superiority, you can set up a tank line outside your opponent's base, and fly in with your Vikings and pick off all their Vikings and Medivacs. If the enemy player runs forward with their Marines, they will take damage from your tanks. If they pull their air army back to avoid this entirely, you can start to leap frog your tanks forward and take an advantageous position.

This leads me to the next point: how to engage your opponent in TvT.

How to Engage Your Opponent with Full Mech

Most players realize the superiority of mech in the current state of TvT and have begun to adopt Hellbat/Siege Tank/Viking as the core of their army and build in the late game. This means that most players end up with a very similar unit choice (typical of mirror match ups) and the winner is the one who engages in the most advantageous position. The importance of positioning and knowing how to engage your opponent is amplified by the Siege Tank itself.

If you and your opponent both have similar army sizes or even if you have a slight supply lead, you will quickly lose your army if you simply roll all your tanks up and try to go into Siege Mode within range of the enemy's army. You will take too much damage from your opponent's initial Siege Tank volleys. It is always more advantageous to make your opponent come to you rather than walk into their Siege Tank line.

If your opponent is turtled, there is actually a very easy way to engage them. All you have to do is park your Siege Tanks outside their second or third base, just outside of their tank line. Set all your tanks up in Siege Mode, defend them with Hellbats and Vikings, and even build a few Missile Turrets to provide protection against Banshee cloak. This will set up a contain so that they cannot leave their base by ground. With all their Siege Tanks trapped inside their base, they will be sitting on 2-3 bases. Meanwhile, you can expand the map, get upgrades, invest in infratstructure, and ultimately overwhelm the opponent. If the opponent wants to expand, they are going to have to attack your tanks and break your contain, which gives you the engagement advantage.

Note: Be sure to set up a scouting Viking or two around the edge of the map. One common way to break a contain is to perform a small drop or two in your main base, then push forward while you are distracted. Stop the drop before it gets there. You should be able to afford a few extra supplies and resources to be spent on Vikings if you are holding a contain since your economy will be better.

If you hold the contain and gain a large economic advantage, you can start to push in. First, you want to get an overwhelming number of Vikings to take out any enemy air support. With air and economic superiority, you can move your Siege Tanks up into range of their tanks. Note that a Siege Tank only has a sight of 11 units but has a range of 13 units in siege mode. This 2 units of space is a safe zone. If you have control of the air, you can move your tanks into this range and safely go into Siege Mode. The enemy player will try to use Scanner Sweep to provide vision, which will work for awhile, but they will eventually run out of energy, at which point you can start safely leapfrogging your way into the opponent's base. It is okay if you lose a few tanks here because you should have an economic advantage from your contain. Constantly train new tanks and rally them towards your contain.

If it is later in the game and the opponent already has a fourth or fifth base, it is actually very easy to force an engagement. Once they get this many bases, it is too hard to defend them all. Typically, Terrans will set up their primary forces just outside their third base, or in between their third base and their natural expansion, trying to defend the bulk of their base. The fourth+ base will not be heavily defended. All you have to do is set up your Siege Tanks in Siege mode within range of the

furthest opponent's base (assuming his main army is not here). In particular, place your tanks in between the passageway between the third and the fourth. The enemy will either have to engage your Siege Tanks or lose their expansion. Either way this is a win for you.

If the furthest expansion is heavily defended, it means the opponent has no defense at their third or has split their army. Either way, if the army is split, pick whichever base has the lighter defenses and just push it with all your troops. If your army is twice as large as the one you are going against, you are going to do just fine even with bad positioning, assuming you have an overwhelming number of Siege Tanks.

Mid to Late Game Swap to Air

The Banshee and the Battlecruiser can be used to help break a Siege Tank stalemate, should you have enough gas.

Banshees are very popular in the early game as part of a rush and they can be great in the mid game as well. In the mid-game, a few Banshees can be a major difference maker against a Terran player who gets way too many Siege Tanks and Hellbats without providing enough Viking or Thor support. A line of undefended Siege Tanks can be picked off very quickly with a couple of Banshees. Even though Terran players have Scanner Sweep, cloak does help a lot since it takes the enemy a few extra seconds to respond to cloaked attacks.

Even a single Banshee is useful in TvT in gaining a position. Even if the enemy just unsieges their tanks and runs back to the safety of a turret, this means you are safe to move your tanks forward and take the position you want. Even if you do not kill many tanks with your Banshees, they can give you the position you want to attack your opponent or set up a contain.

The easiest way to counter this is to get out a few Vikings (which you should have anyway) plus a Raven (which is a strong unit anyway). It is also very helpful to build a few Missile Turrets in your tank line. If you are containing your opponent inside their natural or third base, you can build a few Missile Turrets right behind your Siege Tanks. They will not only attack Banshees but Vikings and Medivacs as well. They also double as detectors. You should have a lot of extra minerals with a mech build so this is hardly a big investment.

In the very late game (4 bases+), it can be a viable to switch into Battlecruisers. The key here is secrecy. You ideally need 4-5 Starports (spread them out so they cannot all be scanned at once), so you can go right in with a single wave of Battlecruisers as soon as they spawn. Another way to avoid suspicion is to kill off some of your own SCVs, freeing up supply for Battlecruisers without making your main army look any smaller. You should not need many harvesting minerals in the late game after you already have a bunch of Orbital Commands.

Back up your Battlecruisers with Ravens and Vikings. Produce the Ravens and Vikings first to help aid your surprise. All you need is an equal number of Vikings to your opponent and you will be fine here. If

your opponent has no Vikings, then you will still want about 6. There is nothing suspicious about getting out Vikings and Ravens, as these are standard parts of the TvT match up.

Vikings are literally the only unit good Terran unit against the Battlecruiser. Ghosts (aside from draining energy) and Marines are completely useless against Battlecruisers. Even in High Impact Payload mode, 1 Battlecruiser easily defeats 1 Thor. With Yamato Cannon, 1 Battlecruiser can actually take down 2 Thors.

Since Vikings are strong against other Vikings as well, if you have equal number of Vikings to your opponent, there is literally no way for your opponent to stop a Battlecruiser/Viking/Raven army. Vikings are also weak against the Point Defense Drone, which is where the Raven comes into play.

If you run into this strategy, the only way to stop this attack directly is through mass Vikings of your own. Use your initial Viking advantage to take down all your enemy's Vikings as a priority. When the enemy's Ravens use Point Defense Drone, retreat out of its range. Once there are no (or limited) number of Vikings, you can kite the Battlecruisers and Ravens. This means attack the Battlecruisers with your Vikings from a safe range, then flee while your attack recharges. Turn around and attack again. Repeat this process and do not let the enemy Battlecruisers get any shots off on your units.

If you are surprised by the Battlecruiser onslaught, you can also take advantage of the fact that Battlecruisers are really slow. You can drop in the opponent's main and to either force a base race scenario or force the opponent back to defend while you increase your Viking count.

Terran vs Zerg

Terran vs Zerg is perhaps the most iconic match up in Starcraft 2. As a Terran player, you must realize that a lot of this match-up comes down to vespene gas. Namely, whether you go bio or mech, you have a good unit (Marines or Hellbats) that only costs minerals, and in order to stop said unit, the Zerg player is going to have to spend gas (Banelings, Roaches, Hydralisks, Infestors, Mutalisks, Brood Lords). Zerglings and Queens, the only vespene-gas free Zerg units, do not fair well against Hellbats and Marines.

As a Terran player, you will gladly want to trade units that cost minerals for Zerg units that cost gas. It is much easier for you to get minerals thanks to MULEs than it is for your opponent to harvest vespene gas. If you can be efficient about this, it is very tough for a Zerg to win. If the “Units Lost” tab is equal, but the Terran’s lost units are all mineral-based and the Zerg’s losses include a lot of vespene gas, the Terran player is far ahead.

Using Widow Mines For Mineral Harass

Be careful about Widow Mines being placed too close to the Hatchery. They will waste their Sentinel Missile on eggs (and not kill them in the process as they have 200 hp).

Widow Mine drops work versus Zerg – 1 per base. For example, load up 2 Widow Mines in a Medivac, fly over the main, drop one, then boost to the natural and drop the other. The best part about this is that Widow Mines do not cause alerts until they actually attack, and by then it is too late. The Zerg has to be paying attention to their mini-map (and have good vision beyond their base) in order to stop this. Widow Mines are so cheap, if you only use one, you do not even need to save them. Just drop them and run.

Widow Mines are also really annoying to use against Zerg because they blend into the creep when burrowed. They are hard to spot, even with detection.

Vikings for Map Control

Always get 1 Viking out to pick off Overlords. There is no reason not to, and you can significantly limit the Zerg’s vision and cost them Larva and minerals. More importantly, this limits the Zerg’s vision of drop lanes. Constantly dropping the Zerg player with Medivacs is essential for successful mid-late game Terran vs Zerg, but they will not be nearly as effective if the Zerg player scouts your Medivacs coming halfway across the map. Clear out the Overlords with Vikings first and then drop.

Reaper Opener

One of the most reliable ways to open a game versus Zerg that you want to progress into the mid-late game as a Terran player is through the use of Reaper opener. This is ideal for the Terran player who wants to take their natural expansion early and possibly even throw down an Orbital Command.

This opener involves going for a Barracks at the 11 or 12 supply mark and getting out 2 Reapers in a row. The entrance to the main is walled off with 2 Supply Depots plus the Barracks to prevent Zerglings from flooding into your main.

As soon as your first Reaper is finished, send it and an SCV towards the Zerg player's base. With proper micro, a Reaper can kill an unlimited number of Zerglings (without Metabolic Boost – which they will not have at this point in the game) that are currently not on the creep. This will automatically thwart any cheesy openers like a 6, 8, or 10-pool.

When you get to the Zerg base, if they went for a fast expansion, try to build a Bunker next to the Hatchery before the Hatchery goes up (if the Hatchery is already up, the creep may prevent you from constructing in range). You can protect the Bunker with your Reaper. Good Zerg players will pull a handful of Drones to attack the Bunker and destroy either the SCV or the Bunker itself before it completes. This is okay, as the goal is not necessarily to win the game with this maneuver but instead make the Zerg spend money and larva on Zerglings and Queens as well as delay mining time. It requires very little investment to get send 1 Reaper and 1 SCV on offense, so even small delays or a couple Drone and Zergling kills make this harassment worthwhile.

If the Bunker successfully completes, you can put the Reaper inside. At this point, there is practically no way the Zerg player can win the game. Even if they eventually overwhelm your Bunker and reclaim their expansion, if you were macroing at home, your base lead should be to the point where a mid-game mech timing push will be unstoppable. Alternatively you could keep training Reapers and slowly macro up while keeping the Zerg's economy down with Reaper harass.

Regardless of what is happening on offense, you want to train 2 Reapers total in a row. Bring this second Reaper in on offense as soon as it completes. Once you get a second Reaper in play, the Zerg player has to use 2 Queens or get out a lot of Zerglings to fend this off. This mineral investment sets the Zerg's economy back more than it sets your economy back to get out of the 2 Reapers. If you only use 1 Reaper, the attack can be easily chased away with a single Queen or just a handful of Zerglings.

Once the 2+ Queens come out, your Reaper will no longer be effective. Scout the Zerg's base to check for a Roach Warren and then use your Reapers for map control. With no Roach Warren or Baneling's Nest, you can throw up a third Command Center inside your main for extra MULE and SCV production while you work on getting up to mech. Wall off your natural expansion and use a Bunker plus a handful of Widow Mines to defend from any counter attack while you spend your gas on Factories and upgrades.

Hellion Openers

The Hellion opener is a common Terran opener in TvZ match-ups. It serves a similar function to the Reaper opener except you are banking on at least getting some Drone kills. The idea is to get out a fast Factory with a Reactor and pump out 4-6 Hellions. These Hellions can then head to the Zerg base and kill off Creep Tumors (preventing creep spread from getting out of hand early in the game), attack the Drones at the natural expansion, and prevent the third base from going down.

The goal here is to keep the Zerg on defense while you secure your natural expansion. The advantage of this build is that it is better at denying the Zerg a third base than the Reaper opener on large maps. On maps where the third base is not very close to the main or natural expansion, it can be a nice opener. Hellions can provide you with the map control you need to take your expansion with a macro Orbital Command while making it painful for a Zerg to take control of their third base.

Note that “denying” the third base is a relative term. The Hatchery will likely already be under construction before you even get your Hellions out there. However, you can prevent the Zerg from actually mining at it for a long period of time, at least until they get out Roaches, Mutalisks, or a Spine Crawler. The longer you can delay mining at the third base, the better off you are in a TvZ. A 2 base Terran versus a 2 base Zerg is a great situation for the Terran player. If they pull a lot of Queens from the main and the natural to try to defend the third, then this leaves their natural expansion vulnerable to Hellions. Queens are slow and Hellions are fast, so just ignore the Queens moved to the third and run into the newly undefended natural expansion and kill some Drones.

The Hellbat Drop

A great alternative to the Hellion opener is dropping with Hellbats. Hellbat drops are extremely effective when the enemy Zerg is playing extremely greedily and has nothing but Queens and Zerglings. When there is no Roach Warren, a Zerg player is extremely vulnerable to even a single Medivac with 2 Hellbats in it for about the first 11 minutes of gameplay.

The thing is to remember that two Hellbats and a Medivac will kill an innumerable number of Zerglings as well as up to 3 Queens with ease. If the Zerg player only has a Spawning Pool and is just Droning up without getting any production tech, they can be in a load of trouble from just 2 Hellbats. The Zerg can make some emergency Zerglings, but they will not live very long versus the Hellbats!

If you catch a Zerg off guard with no Roach Warren or Hydralisk Den, quickly get out 4 Hellbats and 2 Medivacs. Take one loaded Medivac to the furthest expansion and one to the main. The one in the main can be used to not only take out the single Queen or two that is likely there for defense, but the Hellbats can then target vital Zerg tech. Unlike Hellions, Hellbats can take down a building like a Roach Warren, Spire, or Spawning Pool at a fairly fast clip. The Spire in particular is a juicy and easy to get target because it is often still under construction at this stage (meaning it is not at full HP). This will set the Zerg

back significantly since the Spire is expensive and takes a long time to build. If you kill off any tech and render the Zerg unable to get out anything other than Queens or Zerglings, it is game over. Hellbats have enough DPS to take down Spine Crawlers as they are being built, unlike Hellions. If you see Spine Crawlers coming up, just kill them as they are being built – this will put you ahead in resources lost and economy, as the Zerg is likely going to be losing Drones and resources as you pick off a few of the Spine Crawlers.

If the Zerg pulls back all their Queens in order to defend their main base, this leaves their third base which you have also dropped vulnerable. Regardless, they will either be giving up a lot of Drones (and possibly an expansion) or the entire game by losing their tech. Either way, you stand to be in a very good spot if you catch the Zerg in this position.

Positioning Your Dropped Units

The effectiveness of your drop attacks can be increased significantly by the position those units take once they have dropped. The best way to drop and position your units depends on the units being dropped as well as the purpose of the drop.

A drop of 8 Marines that is meant to kill off Drones and possibly the Queen(s) will work best when the Marines are positioned in the small spaces between mineral patches. There are usually one or two mineral patches where Marines can be dropped where the mineral patches will help protect the Marines. Imagine you drop 8 Marines in a Zerg expansion. If your Marines are wedged into a mineral patch, Zerglings will only be able to hit the Marine or two at the front and the Marine or two at the back of the mineral patch. The 4-6 Marines safely wedged in between the mineral patches and other Marines will then be able to safely shoot those Zerglings without taking any damage. This reduces the surface area available for Zerglings to attack your units. If you just dropped out in the open, Zerglings would surround your Marines and take them down quickly. Protected by mineral patches, a handful of Marines can take out a much larger Zergling force (as well as a bunch of Drones in the process).

Hellbats do require a bit more micro to be optimally effective. If there are a lot of Zerglings, you will want to wedge the Hellbats in the minerals as well. This lines all the Zerglings up in just 1-2 spots, so your Hellbat's splash attack will hit many Zerglings at once. Hellbats also benefit from the way they are dropped. Hellbats are slow and have a slow, AoE attack. If you just drop them off and "attack move" on the base, they'll chase the Queen around, then go for the closest Drones. This is a waste. Instead, drop them off directly in the center of the mineral line, each one a little bit apart. Hit the "H" key, let them attack for a few seconds, then you can attack-move. This will make sure they nuke the 15+ Drones that are harvesting minerals with their first few attacks before they do anything else.

If the Zerg player tries to pull their Drones away, scoop up the Hellbats in the Medivac, use Ignite Afterburners, fly over the fleeing Drone Line, and drop the Hellbats right on top of them. This is a great strategy to artificially boost the Hellbat's movement speed. You can unload a Medivac while moving by

pressing “D” (for Unload All) and then click **on the Medivac itself rather than on the ground**. This will cause the Medivac to start unloading units as it is moving!

Controlling the Creep& Engaging the Zerg in the Mid-Late Game

If you are a Terran player fighting against a Zerg player with a primarily ground-based army and are making a mid or late-game push, you must push back the creep by killing off all Creep Tumors before you can advance on the Zerg base. Zerg units move faster on Creep, and this movement speed increase makes all light Terran ground units weak versus Banelings and all armored Terran ground units weak versus Zerglings. Marines can stim and run away from Banelings (even with the speed upgrade) if they are not on creep. Marines cannot run away from Banelings with the speed upgrade on Creep.

As a result, you may have to slowly push the creep back before actually reaching a Zerg expansion. One of the easiest ways to do this is to take 2 packs of 6-8 Marines, stim, scan the creep in several spots, kill as many Creep Tumors as possible, then stim and run your Marines back to the safety of the tanks. Leap-frog your tanks forward into the newly retreated creep space, and repeat this process.

Be careful not to scan for Creep Tumors if Siege Tanks are in range and you have Marines on the creep. The tanks in Siege Mode will blast the creep tumors, and may cause a lot of friendly splash damage to your Marines in the process. This is particularly pronounced if the Zerg player is using multiple Queens and dropping creep tumors in clusters. Generally, the higher level the Zerg players will do this, as creep spreads faster when multiple Creep Tumors occupy the same area.

However, this does not mean your tanks should be out of Siege Mode. This would make you extremely vulnerable. You just have to make sure your Siege Tanks are not near the edge of the creep and are at a safe distance with the rest of your army. Your creep-killing Marine parties can fall back to the tank line should the Zerg player try to attack. You need tanks in Siege Mode to fall back to, so make sure your tanks are in Siege Mode if the Zerg player is within striking distance.

If you are not using bio, 2 packs of 3-4 Hellions can do this same job. Hellions are best since they are fast enough to escape if the Zerg player tries to stop you, and if you lose a Hellion or two the resource cost is so low it does not make much of a difference.

You can make this approach even more effective by dropping 1-2 locations with 1 Medivac full of Marines or Hellbats in the Zerg base as you push the creep back. The Zerg will be focused on your army in the center of the map and be preparing his forces to counter your push. He will likely not be able to handle a dual-pronged drop while simultaneously thinking about your army in the center of the map. If the Zerg pulls back to handle the drops, you can clear out a large amount of creep. If he does not pull back to handle the drops, your army will do significant damage!

Other races cannot do this as effectively as the Terran player because the number of army supplies tied up in the drops would leave their main army vulnerable to an all-out push by the enemy. The reason

Terran players can drop as they are pushing the front is because Terran armies in a defensive position can destroy larger armies who are moving forward.

In other words, if each army has 120 supplies worth of units, and the Terran player has 20 total supplies tied up in 2 drops (2 Medivacs each full of 8 Marines) and the Zerg player has all 120 supplies worth of units on the front lines, if the Zerg attacked the main Terran army, it would be a 120 supply Zerg army versus a 100 supply Terran army (since 20 supplies worth of Terran units are being dropped elsewhere).

This works for Terran because Siege Tanks in Siege Mode and burrowed Widow Mines can handle an enemy army that has them out-matched. This of course requires your Siege Tanks to be in Siege Mode and perhaps defensively positioned Widow Mines. You always want your fall-back point – typically your third or fifth base, depending on the map, to have 1-2 Planetary Fortresses that you can retreat to should the Zerg go all-out with an attack.

If the Zerg player pulls back to defend your drops with some of their army, they may be vulnerable to an attack. Generally, a Medivac full of 8 Marines (10 supplies) takes more than 10 supplies worth of Zerg units to stop, so the Zerg player will have to pull more like 15-20 supplies worth of units back to handle each drop. Given that Zerg players tend to invest a decent amount of supplies in Marines, your main army in the center of the map may have a significant advantage over a Zerg player's main army. This can be a good time to push once the creep retreats.

If the enemy's creep is getting too close for comfort but you are not ready to attack, you might need to clear out a lot of enemy creep at once without risking a lot of units. One way to do this is to perform a small drop in the opponent's main base. If you can drop off 8 Marines or 2 Hellbats, the opponent will typically focus their attention (and their units) to clear up the drop. As soon as you perform the drop, take a handful of Marines or Hellions to go in and clear out as much creep as possible while the Zerg is distracted.

Widow Mines for Creep Control

Another good strategy for controlling creep spread is through the use of the Widow Mine. In the early game, you can plant a few Widow Mines near the border of the Zerg's current creep spread to halt creep in its tracks. The Zerg player will be forced to get out early detection, which will slow down their economy. Many Zerg players do not like to get Lair out until the 8:00 mark or so, so they either have to build Spore Crawlers, get out a Lair early, or to not spread the creep. This map control can help you expand the map aggressively until the Zerg can break your contain.

Avoiding Blinding Cloud

Spread out your tanks as best you can to avoid the effects of Blinding Cloud. Remember that Siege Tanks have a range of 13 and Zerg ground has a max range of 6. You can afford to keep some tanks a bit back. Tanks in the distance are useful as you can use Stimpack to run your Marines and Marauders back to their safety, which is nice versus Banelings. Remember that 1 Viper costs 3 supplies and can only use 1 Blinding Cloud on a full energy bar. If the Zerg can only hit 1 Siege Tank per Blinding Cloud, it is a trade at best.

Supply Depot Walls

Make big supply depot walls to wall off third base when possible. Only allow 1 avenue of attack to your third base. Many locations where you would place your third base have two ramps that lead up to the base. You will want to wall off one ramp entirely with buildings so it cannot be easily accessed by Zerglings. Even if you have to keep rebuilding it, as a Terran on 3+ bases you should have enough minerals to spend on a few extra Supply Depots. Maintaining access to the 5th and 6th vespene geysers is more important than a few hundred minerals here and there.

What you do not want to happen is to constantly have Zerglings flooding into your most distant expansions, killing SCVs and disrupting your vespene gas harvesting at the same time. On maps where the layout makes it hard to create Supply Depot walls, consider going for a Planetary Fortress instead of an Orbital Command.

Dealing with Brood Lords as Bio Mech

The Terran army composition of Marines and Medivacs along with some combination of Marauder, Siege Tank, Widow Mine, Hellbat and Raven support is as popular and effective as ever in TvZ. It does however have one primary weakness: the Brood Lord. Without large numbers of Vikings, the Brood Lord will roll over the Terran army in seconds.

While Vikings are a great counter to Brood Lords, Terran players run into trouble when they are surprised by them. When 8 Brood Lords suddenly appear on the map and are protected against Vikings by Mutalisks and a couple Corruptors, you can lose your army long before you can get out enough Vikings to fend off the attack. However, just a handful of Brood Lords will take a very long time to clear out your base. It is usually not the Brood Lords themselves that clear out the Terran base but rather the Brood Lords clear out the army, and then the reinforcement wave of Zerglings that clears out the remaining Terran infrastructure.

For bio/Bio Mech Terrans surprised by the Brood Lord, there is one weakness of the Brood Lord that many players overlook: it is extremely slow. If you are using a bio backbone for your forces, you should

have a lot of Medivacs. You can load up all your units into the Medivac and then drop into the main base, clearing out all technology and infrastructure. I am talking about a complete “doom drop” here with most of your forces. This will force the Brood Lords into either a base-race (Brood Lord / Corruptor should be much slower at a “base race” than bio) or force the Brood Lords to return and defend. Players will almost always return to defend. This gives you plenty of time not only to destroy 1-3 Zerg bases and take out vital Zerg technology and infrastructure, it also gives you time you need to produce enough Vikings to fend off those Brood Lords.

Playing Full Mech against Zerg

One of the most effective and easiest to execute strategies against a Zerg player in the current state of the game is to go fully for mech. In particular, mass Hellbats, Siege Tanks, and Thors works very well against Zerg players with little micro needed.

The general strategy is to open with a Reaper or two, use the map control this provides to take the natural expansion, use a few Widow Mines and a Bunker full of Marines to secure your base, and throw down a third Orbital Command (a “macro CC”) in the main to boost SCV and MULE production. Once you have started your economy rolling this way, you can start to pump Armory upgrades, Hellbats, Thors, and possibly Siege Tanks. Once you hit about 130 supplies, you can push out and secure your third expansion. From here, you can continue to work on upgrades and go for 200/200 supplies, or attack sooner should the Zerg take a 4th+ base or look like they do not have enough units yet.

Zerg cannot easily stop this unit composition if your macro is comparable to the Zergs. Hellbats destroy Zerglings and do alright versus Roaches, Banelings, and Hydralisks, all while not costing any gas. Thors on the other hand can chase away Mutalisks. Siege Tanks provide extra support against Roaches, Hydralisks, and Banelings. All you have to do is pump about 30 Hellbats with 6 Thors and you can practically walk right over the Zerg army. Only the best Zergs will be able to stop this, as it requires a lot of macro power or very fast Brood Lords to overcome.

The keys to making this work include knowing when to transition into SkyTerran and making sure you keep your upgrades rolling. Once you get 3/3 upgrades, mech becomes very difficult to stop. If the Zerg player starts massing Swarm Hosts or Brood Lords, you need to be able to switch to air units. Slowly trading Hellbats for Battlecruisers can surprise a Zerg player who tries to siege you with Swarm Hosts. Once you get your third base up, make sure you add on 2 Starports so you can more easily switch to air units should you run into Swarm Hosts or a Brood Lord tech switch. Once you get 4 bases, add on two more Starports. You will need 4 Starports to efficiently switch to mass air if you lose your mech army to air units or mass Swarm Hosts.

Do not let your Zerg opponent interfere with your upgrades, as good Zergs will try to snipe your Armories or at least use Contaminate on them to slow the research of the upgrades. If you see this

happening, make sure there is a Missile Turret next to each Armory. This will make it difficult for Overseers to continuously Contaminate and definitely makes it painful for Mutalisks to try to snipe your Armory. Getting to +3 weapons is key for Terran going for mech, as this is the point where Thors begin to 2-shot Roaches and Hellbats will 1-shot Zerglings, even with +3 armor.

Dealing with Swarm Hosts as Full Mech

One of the Zerg's common responses to full mech builds is to get out Swarm Hosts. Swarm Hosts are generally strong against mech, since Locusts outrange Hellbats by 1 and are fast enough to catch slow mech armies. Since it is hard to move your mech around once you have a position, mech units are vulnerable to wave after wave of Locusts.

There are two easy ways you can counter this as a Terran player, but before we discuss those, we need to talk about how to mitigate Locust damage while you work on your counter. To mitigate the damage, you need a lot of Siege Tanks clustered together in Siege Mode. You will need at least 1 Siege Tank for every 2 enemy Swarm Hosts. If you have less than this, you are going to get completely overrun by Locusts. With the Siege Tanks, you will need a few Thors. These will protect your tanks from Mutalisks that try to flank you. Now, most importantly, your Hellbats need to sit in between the Siege Tanks/Thors and the Swarm Hosts. It is okay to lose an occasional Hellbat to Locust fire. Hellbats cost no gas and are much more expendable than Thors and Siege Tanks. Obviously losing Hellbats to Locusts is not an ideal situation, but it will give you enough time to get out the tech you need to counter the Swarm Hosts.

Keep a steady 10 or so Hellbats in front of your Siege Tank line to soak up the small amount of Locust fire. Hellbats will also double as Zergling protection. If you just mass Siege Tanks and Thors, the Zerg might hit you with a wave of 50 Zerglings and wipe out all your precious high-gas units and you will lose outright.

Now that we have discussed how to safely delay the Zerg's Swarm Host push, we will go over the two ways you can counter this strategy.

Using Ravens to Stop Swarm Hosts

If you prefer to continue as full mech (i.e. you have built a lot of Factories and invested in upgrades and tech and do not want to switch), you can add a few Ravens to the mix. Swarm Hosts are extremely vulnerable to Seeker Missile. When burrowed, there is no way for the Swarm Host to escape a Seeker Missile. By the time it unburrows it will be far too late for it to escape the explosion.

Swarm Hosts have a lot of HP, so a single Seeker Missile is not enough to kill a single Swarm Host. However, Swarm Hosts typically burrow near each other, so they will get hit by the splash damage from other Seeker Missiles. I recommend getting out at least 3 Ravens and using Seeker Missile on at least 3

separate but nearby targets. All 3 of those Swarm Hosts will die from the attack. Swarm Hosts are not cheap so killing 3 for free is a big win. Repeat this a few times and your Zerg enemy will either switch their tech up or lose the game.

The best part about using Ravens is that they are the perfect support unit for mech no matter what the Zerg player transitions to next. Seeker Missile is strong against Hydralisks, Swarm Hosts, and Corruptors, while Point Defense Drone works well against Mutalisks and Corruptors (both have a slow attack speed). Keep an eye out for Ultralisk tech though. A switch into air tech is a good move should the Zerg start massing Ultralisks.

Using Terran Air to Stop Swarm Hosts

Another solution to mass Swarm Hosts is to simply switch out of mech into air units. You may not even necessarily need to mass air units - it really depends on the Zerg's choice of support units. If the Zerg player is trying to take advantage of the fact that you are mech and gets no anti-air at all (i.e. Swarm Host, Zergling, Roach, Baneling), you can surprise them with a few Banshees. Banshees deal a lot of damage, and if there is no anti-air, you can rapidly start killing off the high-cost Swarm Hosts before the Swarm Hosts can unburrow and escape.

If there are already Hydralisks or Mutalisks out on the field, a few Banshees may not be enough. In this situation, you may want to switch into Battlecruisers/Ravens. If the Zerg has 30 supplies tied up in 10 Swarm Hosts, they stand no chance in beating a Battlecruiser/Raven army no matter what army composition they go with.

You can typically tell which route the Zerg is going by looking at upgrades. If they are getting melee ground weapons, they are likely going to want to stick with Zerglings and Banelings. If they are getting missile attacks to boost their Locust damage, they are much more likely to transition/supplement their army with Hydralisks.

Zerg Strategies & Match Ups

Zerg is by far the hardest race to learn for brand new players due to the need to Inject Larva and the lack of strong 1-base builds (at least strong in the lower leagues). This race becomes much easier to play once you have mastered a good economic opener and time your Inject Larvas well.

General Zerg Strategies

Below, you will find some effective Zerg strategies and tricks that can be used against in any race match-up. Some of them are something you should do every game, whereas others are obscure tricks that you may only come in handy once in a while. Regardless, learning these strategies and tricks can give you an edge in a tight game!

Finding Safe Overlord Spots

Many of the Starcraft 2 ladder maps have safe zones where Overlords can sit without fear of being attacked until air units get out on the map. The most obvious space is empty space that has no ground underneath it. You will typically want to place an Overlord over the empty space behind each expansion on the map, with priority given to the enemy's natural expansion and then the closest expansions to your enemy's base. This way, without even moving your Overlord, you can see the expansion timings of your opponent. You can also move in the Overlord at any time over the natural expansion to scout for hidden tech structures and production facilities.

Additionally, many maps have elevated pillars where doodads (i.e. trees, misc. structures, decorations) are placed. Even though the Overlord may look exposed, if it is sitting on this elevated perch, units on the ground may not have vision of the Overlord, and hence will not be able to see it to shoot it down. Whether or not this blocks vision depends on whether or not the doodad is elevated on a pillar. Sometimes the size of a doodad may distract you from the fact that the doodad is sitting on a pillar. Just make sure you float the Overlord up "on" to this high ground in order to gain this sight advantage.

Every ladder map is different, so you will have to learn where these spots are on each individual map. Take the time to load a custom game for each ladder map so you can note to yourself good places to stick your Overlords. It is too hard to objectively evaluate a map in an actual ladder game, which is what most people end up doing. You do not have 30+ seconds worth of your full attention to go over the map's terrain in midst of a ladder game. You need to set up a custom game so you can take your time and practice placing Overlords in the right spot. Just taking 5-10 minutes per map to practice this before ladder game can make a huge difference in your scouting abilities as a Zerg.

If you are still unsure of the ideal Overlord positioning is on a particular map, just download a pro-level Zerg replay that is being played on the map you are unsure about. You can bet the pro-level player knows exactly where to put their Overlords. You can then copy this positioning for yourself!

Fast Creep Spread to the Third Base Trick

Spreading creep as fast as you can to your expansions is necessary in order to defend them from attacks from all races. However, sometimes Zerg players like to grab a third base before the creep has been spread. Depending on the layout of the map, sometimes it can take a while for the creep to spread to the third base, even if you are diligent. This leaves the third base vulnerable to an early-game attack.

There is one way to deal with this. When you build a Hatchery and cancel it, there is a brief window where small amounts of creep are generated in the explosion of the cancellation. This is not enough creep to build a structure, but it is enough to drop a Creep Tumor!

Build a fourth Hatchery in between your natural expansion and your third base. Cancel it and then quickly drop a Creep Tumor in the resulting creep where the Hatchery was located before the creep disappears. Your creep tumor will plant in the middle of the map this way, allowing you to spread your creep in both directions. This will increase the speed at which Creep is spread to the third base by 30 seconds to a minute (depending on map layout and the number of Queens and Creep Tumors used).

This approach does slow down your macro given that you have to save up 300 minerals to drop the extra Hatchery plus you lose 75 minerals permanently when you cancel construction. However, this is a useful trick to know if you took a very early third base (around the 4:30-5:30 mark) and you suspect a late rush or early timing attack is coming and you need to get the creep out to the third base immediately. It is better to lose 75 minerals cancelling this 4th Hatchery than it is to lose 75 minerals plus the actual expansion by letting the opponent take out your third while you defend the natural and main. Zerglings can surround enemy forces better on Creep, and Queens can be moved more freely to a base that has creep. You can even get the creep down at the third faster this way so you can build Spine or Spore Crawlers, depending on the nature of the attack. Reinforcements will also come faster to help defend the third base.

While this is not something you should do every game as part of your build, it does come in handy as it can help save your third base from early pressure, especially if you like to use Queens.

Using Queens to Support Brood Lords and Ultralisks

In the late game, one of the downsides of Zerg is that you will have a decent portion of your supplies tied up in Queens. Rather than let the Queens sit at home with nothing to do and fight your enemy with a smaller army, when you make your final push, you can pull the Queens to the front line. You may be

thinking this is a bad idea since you need Queens to Inject Larva. However, once you have 5+ Hatcheries, nailing every Inject Larva is not nearly as important, particularly if you have stockpiled Larva at each of these Hatcheries with a few previous Inject Larvas before pulling the Queens.

Queens that have been sitting around most of the game with full energy pools are excellent support units on the front line. In particular, they can use Transfuse on Brood Lords or Ultralisks to restore 125 health. Given that a Queen with full energy can use Transfuse 4 times (500 total health), this will be a huge boon to your offense. A Queen that gets off 2-3 good transfuses is more than worth the 2 supplies it is taking up as part of your army.

Technically, you can use Transfuse to heal up any unit. However, it is easiest to transfuse your Brood Lords and Ultralisks (or even other Queens, especially if they still have energy), as these are the only Zerg units with enough HP where Transfuse can be used reliably to restore large amounts of HP. These units are also high DPS and very expensive, so you will want to make the effort to keep them alive via Transfuse.

Queens move slow off of the creep, but this is okay – they should be in the back anyway. You can bring a few Overlords along to generate creep and use your Queens to drop a few Creep Tumors in the generated Creep. This will help increase the Queen's mobility and will instantly give you access to creep right outside your opponent's base.

Be very careful about how your Queens are positioned. The Queens must be in the back. They are a big and bulky unit and sometimes can block your Ultralisks from reaching the front lines. This is a devastating mistake. You can get around this by binding your Ultralisks and your offensive Queens to separate control groups so you can move them independently.

Zerg Supply Trick – Late Game

When a Zerg player constructs a building, their current supply count drops by 1. The supply count drops immediately as soon as the building starts being constructed, and these supplies are immediately available for use to morph new units. If the building is then cancelled before it finishes, you get to keep the Drone. If you maxed out your supplies by training new units before the Drone finishes constructing the building and you then cancel the building, you end up over the supply cap.

Here is an example commonly known as the “extractor trick” for the Zerg to illustrate this process:

- Make 10 Drones, getting up to 10/10 supply in the beginning of the game.
- Start construction on two Extractors. This drops the supply count to 8/10.
- Make two more Drones. This increases the supply count back to 10/10.
- Cancel the two Extractors. You will get your 2 Drones back, going up to 12/10 supply, which is over your current cap.

While later calculations proved that this was not an efficient opener, the idea of getting out units beyond your current supply cap is a valuable strategy.

In particular, it is extremely useful in the late-game when you have a large pool of resources banked up and are already maxed out at 200/200. You can make large numbers of Evolution Chambers, train new units, then cancel all the Evolution Chambers and send the Drones back to work. Building then cancelling each Evolution chamber only runs 18.75 minerals, so across 20 chambers, this is a mere 375 minerals.

Meanwhile, while those Evolution Chambers are building, you can squeeze out another 20 units, ending up with 220/200 supplies! If you're a fast clicker and have a large amount of creep spread, you can even push this to 230/200 supplies. Spore Crawlers work too as an alternative to Evolution Chambers if you do not have enough creep space to build with. The only downside to Spore Crawlers is they build in 30 seconds (to the Evolution Chamber's 35), so you will not have as much time to lower your supply cap.

In the late game, a good Zerg can easily have 6 Queens and 80 Drones, leaving them with a mere 108 supplies in their army count. They run into trouble versus the "Protoss Deathball" because a 130-140 supply Protoss army is simply too large compared to the Zerg army, regardless of unit composition.

As a Zerg fighting a maxed-out Terran or Protoss on 3+ bases, if you want to engage their army directly, you will need to pull Queens and create extra army supplies through this technique. If you can trade armies, you do not have to worry about pulling the trick again before going in – if you banked larva before your attack, you should be able to remacro to just 200/200 faster long before the Terran or Protoss is able to produce that many units.

Once the map starts to get mined out, you may even want to convert some Drones into automated defense (Spine Crawlers and Spore Crawlers) permanently. If you have 5000 of each resource type banked, there is no reason to have 80 Drones. You can cut this down to 60, then squeeze out an extra 25 supplies with this Evolution Chamber trick. This will give you 160+ supplies to dedicate to your army and Queens!

Managing the Cost of Vipers via Evolution Chamber

The Viper is a Zerg casting unit that is able to drain the health of targeted buildings in order to restore its energy. This unit has two powerful abilities, Abduct and Blinding Cloud, but both cost a lot of energy. Despite having no default attack of its own, it is quite expensive, costing 3 supplies and a lot of vespene gas. As a result, if you make too many Vipers, the number of offensive units in your army will not be high enough to be an effective combative force.

Rather than making large numbers of Vipers, you need to make use of the Consumption ability. This lets the Viper convert your own building's health into energy. You can do this easily by throwing down 4-6 Evolution Chambers in the middle of the map. You do not want to build these all the way in your base, as you do not want to have to send the Vipers all the way back to your main or natural expansion each

time they need to drain energy. Instead, keep the Evolution Chambers in a forward position near the edge (not too close to the edge) of your creep spread.

This way, you can use just 3-4 Vipers total. You can use Abduct 6-8 times to pick off high value targets, then retreat, gather energy, and repeat the process. If you can pull this off a few times, you can remove all the high value targets from an enemy army. It works best versus Terran and Protoss though, as Zerg players tend not to use many high value units in ZvZ.

The Zergling Run By& Mutalisk Hit and Run

One of the key Zerg strengths that enables them to win games (even when behind) is the mobility of the Zergling and Mutalisk. Both of these units are extremely fast. Zerglings deal a lot of damage and cost very little, so they can be sacrificed routinely in order to deal more damage to the enemy. Meanwhile, while Mutalisks are too expensive to just throw away, they have fast regeneration and are flying units with a decent HP pool, making them strong enough to use in hit-and-run attacks.

Zergling run-bys and rush-downs are very important Zerg strategies. A run-by is when you literally run your Zerglings by your enemy's defenses and get into their mineral line or main base. Zerglings are much faster than other ground units, so even if you ultimately lose a couple Zerglings during the "run by", some will survive and may then inflict more than enough damage to make up for the few Zerglings lost during the initial "run by" part of the strategy.

A rush-down is like a run-by but instead you are going for exposed buildings. You might not even have to run by the enemy's troops. An example of this is when your opponent tries to take a 3rd (or higher) expansion. Just send 12-24 Zerglings and attack the fledging base before it gets established. If the base is almost done, you often will get a lot of workers too as your opponent starts to transfer workers. Even if you lose all the Zerglings, it is a great trade to lose cheap Zerglings in order to kill off a bunch of workers and possibly destroy or force the cancel on an expansion. This is definitely a worthwhile trade. It only takes about 10 seconds for a pack of Zerglings with decent upgrades to rush down an expansion, so even if your opponent reacts swiftly sometimes it is unstoppable if the opponent's army is out of position.

Mutalisks on the other hand do not do nearly as much damage as Zerglings and are much more expensive. However, they have the primary advantage of being able to fly, dealing a form of splash damage, and being even faster than Zerglings. The end result is that you can constantly fly into your enemy's base, get a few shots off on workers or structures near the edge of the map, then fly out as soon as the enemy moves their units into position. The only unit that can actually catch a Mutalisk is the Phoenix, so as long as your opponent does not already have a lot of those out of the field, you will have no problem escaping with your Mutalisk pack.

Typically, your best option is to go for workers, at least until your enemy starts using automated defense to stop your attacks. Mutalisks are very efficient at killing workers thanks to the splash damage of Glave Wurm. It only takes 12 Mutalisks a couple seconds to clear out a mineral line.

Mutalisks are not nearly as effective as Zerglings at killing structures, but you can make it work. It is very difficult to kill high HP targets like a Nexus or Orbital Command, but you can get valuable tech structures. I am particular partial to snipping the Armory (against Terran), the Templar Archives (Protoss), or the Spire (Zerg). This lets you delay upgrades against Terran and Zerg as well as delay Psionic Storm in addition to the economic damage you cause.

Using Infested Terrans

Infestors are a great unit to get in all Zerg match-ups. Most players however only get them for the Fungal Growth ability and completely ignore another useful Infestor skill: Spawn Infested Terrans.

There are 3 primary ways to use Infested Terrans in Zerg battles. The first is if you need some emergency anti-air in the earlier phases of the game. Before your opponent starts getting a lot of upgrades, Infested Terrans can help kill off early Void Rays, Medivacs, Vikings, and even Mutalisks.

The second strategy for using Infested Terrans also takes place in the earlier portions of the game. When your Infestors have already spent their energy on Fungal Growth, the fight is close, and you need an extra edge. If you have 8 Infestors and each one has 50 energy, you could convert that into 16 Infested Terrans. These free 16 Infested Terrans can be spawned despite the fact that not one of the Infestors had enough energy for Fungal Growth. This is a significant amount of units, especially if no player is maxed out, so if you have more than a couple Infestors on the field, it is a strategy you must employ. Even if the eggs get destroyed, that is still a lot of damage that the eggs will be soaking up, allowing your other units to live longer and deal more damage.

Late in the game once your opponent has maxed out their upgrades, Infested Terrans begin to lose their luster. Their damage does not increase with upgrades, so when your opponent gets +3 armor, Infested Terrans deal virtually no damage (they are still decent at soaking up damage, just not as good as they are in the beginning of the game).

With that said, this does not mean that the Infested Terran has no purpose at all later in the game. There comes a time in many long games where things have stalemated and you and your enemy are trading small blows while waiting for one another to make a move. Typically, Infestors do not participate in such harassment techniques, as they are too fragile and expensive. However, through Infested Terrans, there is a way to get your Infestors into the game.

Once your Infestors have full energy, move them burrowed across the map to the enemy's most distant expansion (make sure to scout the path out ahead of time with an Overseer or Overlord to prevent yourself from running into a detector along the way). Next, while you are sitting burrowed just out of

range of their expansion, hold shift, use the move command to move your Infestors in closer, then (before your Infestors get there, still holding shift), press “T” (for Spawn Infested Terran) and click ~50 times around the enemy’s expansion. If you do this right, when your Infestors get into position, they will practically instantly spawn their full energy bar worth of eggs, and 50 Infested Terran eggs will appear on the map in a second. These Infested Terrans can kill off any workers that do not flee as well as the expansion itself long before the enemy can respond. Meanwhile, you can keep your Infestors burrowed the whole time, allowing them to slip safely back into your army.

Zerg vs Protoss

Zerg players typically fear Protoss opponents more than any other match-up. The strength of the Protoss army in the late-game plus the ability of the Protoss to dictate the opening of the game with a Forge Fast Expand opener makes playing against Protoss opponents seem difficult. Fortunately, with the strategies below, you will no longer have to fear Protoss opponents.

Mothership Core

Keep an eye out for the Mothership Core if you go for a really economically-oriented build. Good Protoss players tend to get the Mothership Core out when they are getting ready to attack, particularly if that Mothership Core leaves the safety of the Protoss main or natural expansion. If they were planning on expanding, they would keep the Mothership Core on defense so it can bank up energy for Photon Overcharges. Alternatively, an economically-focused Protoss would skip an early Mothership Core altogether and instead spend the gas on Sentries (to allow energy to generate) or tech. If you see a Mothership Core pop out before the 8:00 mark, you will want to add in a few extra Queens (and possibly Zerglings).

Responding to Forge Fast Expand

Protoss players will almost always opt for some variant of the Forge Fast Expand build in Protoss versus Zerg games. The higher your rank gets, the more common the Forge Fast Expand build becomes. Whether they go into Stargate play, an Immortal/Sentry timing, or try to eventually secure a third, either way you are powerless to stop this opener.

The most popular Zerg response to seeing a Forge Fast Expand is to take a very early third base (before the 5:00 mark). The reason this works is because a Protoss player that invests a lot of early minerals in a Nexus, Forge, and Photon Cannon is simply unable to make an attack in the early game. Unlike the other two races, once a Protoss player has committed to a Forge Fast Expand, they cannot just cancel it and go into a successful rush or all-in style attack. They can make a 2-base all-in attack, but units are not suddenly going to show up on your doorstep. A transition into a sudden attack is not possible simply due to the amount of time involved in building Protoss structures.

The magic length of time here is 3 minutes and 40 seconds. This is how long it takes for a Protoss player to throw down a Gateway, a Cybernetics Core, and Warp Gate technology (and that is assuming Warp Gate is constantly Chrono Boosted). This is the amount of time invested, not the amount of money. Cancelling a Nexus or a Forge may restore some minerals, but it is not going to speed up the path up the tech tree!

Given that the first Gateway does not go down until the 3:30 at the earliest (assuming Gateway before Photon Cannon, which is risky in and of itself). Adding all the numbers up, this means that a Protoss player who opens with a Forge Fast Expand build will not have Warp Gate technology done until 7:00 at the very earliest, but possibly as late as 8:00. Getting units out of advanced tech like Stargates or Robotics Facilities will occur even later, given the amount of gas required.

In a typical macro Zerg build, a third Zerg base can be planted by 4:10 and a Hatchery takes 100 seconds to build. This means the third base for the Zerg will be hatched by the 5:50 mark. Since the Protoss cannot get out Warp Gate tech until 7:00, this gives you plenty of time to scout with an Overlord around to prepare for some sort of Warp Gate timing push. You will have even longer to prepare if Immortals or Phoenix are coming.

Protecting Your Fast Third Expansion from Cannons and Skirmish Attacks

Going for a fast third base might seem like a dangerous and greedy playstyle, but it is not, as the Protoss player cannot really do much about it once they have invested in the Forge Fast Expand build. There are only two real threats you have to watch out for: cannon rushes and minor attacks.

Cannon rushes are the most common (and most deadly if undetected) response to a fast Zerg third base. If the Protoss player sees your expansion, they can throw down a Pylon hidden just outside of your field of vision at the natural and the third. They can then build 1-3 Photon Cannons against the mineral line or even behind the Pylon, where they cannot be easily accessed by Zerglings. On some maps, a Photon Cannon can be “walled in” by 2 Pylons and the mineral patches, meaning that it cannot be hit at all by Zerglings. Pylons are cheaper and have more HP than Photon Cannons, so “walled in” cannons are not easy to engage in a cost-efficient manner.

Once the cannons go up, you are practically guaranteed to lose the base. The best way to prevent this from happening is to scout it ahead of time. You always want to patrol around the perimeter of a Hatchery under construction with a Zergling so you can spot any attempts to cannon rush. You can split up a single pair of Zerglings, putting one to patrol around the natural and one to patrol around the third. Once the Hatcheries are up and the creep is spread, you can stop your patrol.

If you do find yourself in a situation where you are being cannon rushed and lose your third base to Photon Cannons, understand that this does not mean the game is over. In fact, you can come out of this ahead if you follow this strategy: Do not pull Drones to attack the cannons and save your third at the cost of losing Drones to the cannons – instead let the base go. It is even better if you can cancel the Hatchery after the Protoss player has invested in Pylons and cannons.

Instead of trying to bust down a well-entrenched Photon Cannon, just ignore that base for now and build a Hatchery at the next expansion over. While it may feel risky to take such a far expansion so early in the game, understand that the Protoss player really cannot do anything about this.

Remember the Protoss cannot get Warp Gate technology out to 7:00 once they go for a Forge Fast Expand, and even then, that timing is under ideal conditions. That does not even include the extra minute it will take to get out enough production facilities and to warp in a wave or two of units. Most 2-base Protoss timing attacks hit at 8:30 at the earliest, and that is when everything is done perfectly. When you add on the Protoss spending 100-200 minerals on Pylons and another 150-450 minerals on Photon Cannons very early in the match, a Protoss player that goes for early Photon Cannons is not going to be able to mount a meaningful attack until 10:00 or later! By then, your creep should be spread to the fourth and you should have some units on the field to mount an appropriate defense.

As an alternative to the cannon rush, many Protoss players like to poke the third base with a couple of units – typically the Mothership Core and 1-3 Zealots. This is an effective strategy as it forces the Zerg player to stop making Drones and instead make some extra Zerglings and Queens.

The Protoss player gets ahead in this situation in two ways. The most common way is when the Zerg player sees 2 Zealots and a Mothership Core and overreacts by building 20+ Zerglings. This is 10+ Drones that the Protoss player just denied simply by showing up with 2 Zealots and a Mothership Core – a huge blow to the Zerg economy at this stage in the game. The Zerglings are then useless when the Protoss never follows up this attack.

The other way the Protoss player gets ahead is if the Zerg player does nothing at all. The Mothership Core and a Zealot or 2 can easily pick off a Queen or two. Once the Queen is dead, Zerglings will not help since the Mothership Core cannot be hit by ground units. Time Warp can prevent the Queens from kiting the Zealots around to buy time for reinforcements to arrive. A little attack like this can actually do damage if the Zerg has nothing to defend it.

To escape taking damage from a small attack when going for a very fast third, you need to get out a few units, but not too many. If the Protoss player went for a Forge Fast Expand build and you see a Zealot or two trickling into your base at 6:00-6:30, understand that is mathematically impossible for a significant-sized attack to be on the way. If the Zealots are coming this early, they are likely just being Chrono Boosted off of a single Gateway (perhaps 2). If Chrono Boost is being used on the Gateways, this actually delays Warp Gate tech even more. Without Chrono Boost being used on the Cybernetics Core, Warp Gate tech will not be done until around 8:00 at the earliest.

You will want to get 4 Zerglings per Zealot and have 2 Queens to fight the Mothership Core. Two Queens can easily push the Mothership Core away, and once the Mothership Core is gone, you Queens and Zerglings will have no trouble quickly cleaning up a handful of Zealots. If you see 2 Zealots and a Mothership Core, just make 4 pairs of Zerglings and an extra Queen at your third. You only cut a few Drones to get out such a defense and you are investing no more than the Protoss player has to in order to make the attack. Whenever you spend equal money to stop an attack against a player who is on one less base than you, you come out ahead in the exchange.

Keep an Eye on the Protoss Forge in the Early Game

The activity (or lackthereof) at the Forge is particularly telling when a player opts for a Forge Fast Expand build. If the Forge is researching an upgrade before the 6:00 mark (you can see the structure moving quickly if it is upgrading something), you are likely in for a +1 or +2 weapons timing attack.

The 6:00 mark is important though. If the upgrades are coming out at this point or earlier, the Protoss player is delaying technology and advanced production facilities in order to get out their +1 weapons sooner. The only reason to do this is if you expect to actually use your Gateway units in the near future. This might be 6-8 Gateways or 2 Robos and 4+ Gateways – it depends on the nature of the build. Whether it hits in the early or mid game, the timing attack is likely to be powered on two bases and happen long before the Protoss player is maxed out.

If the Protoss player was not planning on aggression and instead just focusing on macro, they would want to emphasize tech and getting out units in order to take a fast third, then catch up on upgrades later with 2-3 Forges chrono-boosting out upgrades. Of course, at lower leagues, there is always the possibility that players may just be getting out early upgrades because they are bad and do not know any better!

While you cannot predict exactly when your enemy's timing attack will hit, a good solution that covers all areas is to get out some Swarm Hosts. Swarm Hosts are extremely strong against Gateway units and Immortals. Additionally, Colossi without the Extended Thermal Lances upgrade cannot easily defend Protoss units from Locust fire. You do not have to worry about mass air or Colossi with Extended Thermal Lances for a timing attack this early in the game. After all, in the early/mid game, a Protoss player on two bases is not going to have enough gas to get out a Robotics Facility, a Robotics Support Bay, Extended Thermal Lances, and a Colossus (200 gas each) and on top of that spare some gas for Forge upgrades. It just is not mathematically possible. Mass air suffers a similar problem. Stargates and Void Rays are 150 vespene gas a piece. If the Protoss is pulling gas to use on Forge upgrades instead of focusing on air, their army will be much smaller when their timing attack hits.

Upgrades after the 6:00 mark are not really indicative of anything. Most Protoss players will get +upgrades to their ground units as ground units are used in every game. Even "SkyToss" builds can be supplemented by Zealots, especially considering that SkyToss costs a lot of gas, leaving the Protoss player with a lot of extra minerals to burn. The key is whether or not technology was delayed in order to get out the upgrades.

Scouting for Proxy Pylons throughout the Game

Just like you scouted for Pylons to stop the cannon rush on your fast third base, you want to constantly scout for proxy pylons at the edges (and beyond) of all your bases. Protoss players will be constantly

trying to hide Pylons on your “side” of the map (i.e. draw a line down the middle of the map between your base and your opponent’s base – the Protoss will try to drop Pylons on your half of the map).

Spreading the creep can help keep the Pylons from encroaching too close to your bases, but this may not help at all if the Protoss player is using Dark Templar, which will not show up on the mini-map regardless. The only way to keep Pylons at bay is to regularly send a pack of 12 or so Zerglings on patrol duty to clear out any Pylons that may go up. This is particularly important if you see Zealots or Dark Templar stream into one of your furthest expansions – you can be almost certain that they are using proxy Pylons at this point. The Protoss player is going to be constantly planting these if they are good, so you need to be constantly patrolling for them.

Proxies are not necessarily going to be close to your actual bases. You need to scout every nook and cranny of your “side” of the map. This is particularly important on 4 player maps where you do not have cross-spawns. For example, imagine you are in the top left corner of the map, and your opponent is in the top right corner of the map. Do not expect the proxy Pylons to just be in between your two bases. A good Protoss player is going to cover the southern half of that map with Proxy pylons. The southern half of the map in this example a great place for proxies since Zergs tend to spread the creep towards their opponent’s base and place Overlords in between their base and their opponent’s. The southern half of the map may remain unexplored; proxy Pylons that live here have a high life expectancy.

The only way to stop proxy Pylons is to constantly scout for them with Zerglings. Never underestimate the number of proxy Pylons a Protoss player will make. Typically, the higher your rank gets, the more proxy Pylons Protoss players (say that 5 times fast!) will build. If you take down a proxy Pylon, that does not mean there are not still a few more redundant Pylons alive somewhere. It is not unusual for a pro-level Protoss player to have 5+ proxy Pylons, allowing him to warp units in to practically any point on the map as vulnerabilities in the opponent’s positioning appear.

Beating the Sentry/Immortal All In With Swarm Hosts

Going for an early/mid game Sentry and Immortal ball off of two bases is a very popular strategy to use against Zerg players. Strangely enough, the little-utilized Swarm Host is actually very effective in countering these builds. Sentries and Immortals are slow units - they cannot easily outrun the Locusts. They are not particularly good at destroying Locusts either. As a result, a handful of Swarm Hosts that are well-microed can stop these sorts of builds. It takes some practice to get used to burrowing the Swarm Hosts, letting the Locusts spawn, then unburrowing and kiting back with the Swarm Hosts while the Locust cooldown resets.

You do not want to get too many Swarm Hosts however, as the Protoss may transition into Colossus from here, which are fairly good against Swarm Hosts. Just get a few to help hold off the Sentry/Immortal all-in. You will need the Infestation Pit anyway in order to tech to Hive and possibly get out Vipers.

Supplementing Swarm Hosts in the Mid and Late Game

Swarm Hosts are effective versus all manner of Protoss ground armies. However, in the mid-game, Swarm Hosts are weak against air units. Protoss air units are expensive, so there are only so many Protoss air units that you will encounter in the mid-game. Hydralisks on the other hand are good versus Protoss air units, as long as there are 10+ Hydralisks and army sizes are similar. While 5 Phoenix can easily handle 6 Hydralisks, 12 Hydralisks can defeat 10 Phoenix. The higher the Hydralisk count, the harder it is for the Phoenix to meaningfully reduce the army size via Graviton Beam.

Hydralisk and Swarm Host is a particularly potent combination for a mid-game attack. The Swarm Hosts are strong against anything on the ground, whereas the Hydralisks provide support in between Locust waves and against air units. This combination is strengthened by getting out some upgrades. Hydralisks and Swarm Hosts share missile attacks and ground carapace upgrades, so it is easy to push up to 2/2 very early in the game. Hydralisks become much less vulnerable to Phoenix if the Hydralisks get an armor advantage. This is common because Protoss air weapons are one of the last upgrades to get researched in any match up.

In the late game, should the Protoss player start getting a large Colossus count, the Swarm Host and Hydralisk army becomes less effective. In order to make this unit composition work, you need to add Vipers and some forward-placed static defense including Spine and Spore Crawlers (i.e. spread the Creep to just outside the Protoss player's base and build defense there). The Swarm Hosts can siege the Protoss enemy from the safety of their forward-placed automated defense. Should the Protoss player try to outrange your structures and take them down with Colossus, use the Viper's Abduct ability to snag them and pull them into your static defenses and Hydralisk army. The Colossi will melt instantly. Even on offense, use Vipers to grab the Colossi out of the Protoss ball. If there is leftover energy, it can be worthwhile to grab Archons, Void Rays, and Immortals as well, as all are high cost units.

Of course, if the Protoss player makes a full transition to air units, you need to focus nearly exclusively on the Hydralisks with a few Vipers, as Swarm Hosts cannot hit air units. Abducting high-value targets like Void Rays, Tempests, and Carriers over top of static defensive structures and Hydralisks is still your base strategy for gaining an advantage over SkyToss. You want some Spine Crawlers mixed in with your Spore Crawlers as well, as this will prevent High Templar from getting too close to storm your Hydralisks. Use Zerglings to rush down High Templar as well, as Psionic Storm is the only way a Protoss player is going to beat mass Hydralisks/Spore Crawler/Viper with mostly air units.

Stopping 2 Stargate Phoenix

A popular strategy for Protoss players to use versus Zerg players on larger maps is to open with a Forge Fast Expand, get out 2 Stargates, and produce a fast 3-7 Phoenix. With just Phoenix, the Protoss player is actually not going to be able to stop defeat the Zerg player. Instead, this is typically done to slow down

the Zerg player while the Protoss secures their third base and then is set to go full-on SkyToss on 3 bases.

One trick I have seen pro Zergs use to thwart this play is to sneak about a dozen Zerglings over to where the Protoss third base would be and wait in a hidden area (they will not be useful against Phoenix anyway). When the Protoss player sends in his Phoenix to harass, he will also be expanding, thinking that you are busy. At this time, you can use those hidden Zerglings to take down the Probe and the buildings under construction.

It is best to not reveal your Zerglings until the buildings have already started being warped in. A cancelled Nexus and Pylon still costs 125 minerals, but more importantly, it costs the Protoss player a noticeable amount of time. If the Nexus gets under construction for 20 seconds before you reveal your Zerglings, the Protoss player will have to cancel, train units, clear your Zerglings, then re-start construction. This is a big delay for a Protoss player that is attempting to go for full SkyToss (which is very expensive).

This works so well because a Protoss player typically only has 1-2 Warp Gates if they go for 2 early Stargates – they cannot afford to produce off of more, so there is no reason for them to have those extra Gateways.

Additionally, you will want to get 1 Spore Crawler up at each of your expansions if there are more than 2 Phoenix. It is a very small investment and it is so incredibly useful for a Zerg player in PvZ. Not only will it help chase away Phoenix, but it will also provide detection against Dark Templar harass as well as chase away Oracles and Warp Prisms.

Ultimately, when the Phoenix count starts getting high, you will have to get out about a dozen Hydralisks. Phoenix are initially very strong against Hydralisks, as Phoenix do bonus damage to light units and Hydralisks are light. The only problem for the Phoenix is that they have to pick up Hydralisks one at a time and cannot attack while lifting a Hydralisk. The end result is that while small numbers of Phoenix beat equal numbers of Hydralisks, once the Hydralisk count reaches about 10, Hydralisks start beating out an equal number of Phoenix. The reason is that in a 10 Hydralisk and 10 Phoenix battle, 1-2 Phoenix will go down before they ever get in range to use Graviton Beam. If the Phoenix count reaches 5+, get out about a dozen Hydralisks and it will stop the harass in its tracks.

Possible Hydralisk/Roach Counter Attack

This 1-2 minute delay in getting up a third base makes the Protoss extremely vulnerable to a mid-game Hydralisk push, **but only if the Phoenix count is low**. As a Zerg, you can use your banked gas to get out ~12 Hydralisks and ~12 Roaches and make an attack around the 11:00 mark. If you delayed the Protoss' third base and they went with a 2 Stargate opener, there is no way that the Protoss player has what they need to stop Hydralisks when you attack. Protoss need Colossi or High Templar with Psionic Storm to

stop Hydralisks, but if they went early Stargates and had a delayed expansion, they will not have either of these units by the time you can put together this attack.

Granted, this multi-step approach to handling 2-base Phoenix is definitely a more advanced strategy. However, in the lower leagues, you will not run into enemy players using 2-base Phoenix very frequently, and if you do, the Protoss micro and macro will not be where it needs to be in order to make this build effective.

Additionally, this counter-attack requires a judgment call: if the Protoss player got out more than 5 Phoenix and kept them all alive, you need a large Hydralisk ball before this can be viable. If the Protoss player got out 5+ Phoenix, then there might be too much energy out for Graviton Beam to only use 12 Hydralisks. Phoenix are strong versus Hydralisks when the numbers are low. However, once there are 10+ Hydralisks on the field, it is too difficult to pick them up one at a time to meaningfully influence the battle without at least an equal number of Phoenix.

Checking (and Denying) the Early Third Base

No matter what build they go for, a Protoss player is unable to secure a third base against a Zerg player before the 9:00 mark in the game, and even then, it will not be strongly defended until 10:00 or beyond. The reason for this is that the Protoss player simply is not going to have enough resources to invest in 3 Nexuses, get structures out, and have enough money left over to train enough units to defend the main/natural and third base this early in the game.

The end result is that a pack of 12 Zerglings can check for any early Nexus and shut it down with ease. If the Protoss army is out defending the fledgling expansion, you can surround it with Zerglings or Roaches. Another option would be to add in Mutalisks and use the Mutalisks to take advantage of the fact that if the Protoss player went for 3 fast Nexuses, they will not have enough resources leftover for Blink or Phoenix for a few more minutes and as such will be very vulnerable to Mutalisk and Zergling harass.

Protoss players are particularly weak when trying to take a fast third base. The Terran player is able to build a macro Orbital Command inside their main base, behind the protection of their wall in. A Zerg player is able to expand earlier since Hatcheries are cheaper and they can get up to a high Drone count fast. Protoss on the other hand cannot secure their expansions until they are actually built (Photon Overcharge), so make sure you use Zerglings and possibly Roaches to attack any third Nexus that comes down before the Protoss player is able to defend it.

If the Protoss player spends a bunch of resources on Gateway units or Photon Cannons early in the game to defend their fast third, they will have to temporarily sacrifice technology to make this happen. This leaves a window of weakness where they are susceptible to Swarm Hosts or even just mass Roach/Zergling attacks.

Zerg vs Terran

The ZvT match-up is certainly a love-hate relationship. It is fun when your Banelings and Fungal Growths get big hits, and not so fun when they do not. In this section, you will discover a variety of strategies you can use to improve your chances of victory in ZvT.

Very Early Game – Pre 4:30 Mark

If you see an SCV scouting out your base in Zerg vs Terran before the 4:30 mark or so and you went for a fast expansion, you need to get out 2-4 Zerglings right away. Otherwise, a Bunker may go down outside your natural which can be an automatic game-ender if you do not have a few Zerglings to stop the construction. These Zerglings can then secure the Xel’Naga Watch Towers, effectively preventing the Terran from engaging any sort of attack until they get Hellions out. Theoretically the Terran could still attack with Marines, but if you control the Xel’Naga Towers, you will see it coming from a mile away and can get up an adequate defense.

Tricks for Stopping Early Hellion Harass

Hellions are a persistent part of Zerg versus Terran match-ups. If you play games on ladder and get to a reasonable rank, you will regularly encounter Hellion attacks in the early game, either by drops or by run-ins. Typically, the Terran player tries to attack the mineral line of the natural (by running in the front) or the main base (via a drop) in order to kill Drones.

Typically, you cannot save all your Drones, and this is expected. It is okay if you lose a few Drones because the Terran player loses resources in the form of lost Hellions but also the Terran player loses economy by investing those minerals into early Hellions instead of another Command Center.

This opener starts to work heavily in the Terran player’s favor if they can hit both your main mineral line and your natural’s mineral line in a single attack. You have to prevent dropped Hellions from escaping down the ramp into your natural expansion and you have to prevent Hellions attacking from the front from getting up the ramp and into your main in order to come out ahead (or at least even) from this sort of attack.

The best way to deal with early Hellions like this is with the Queen. Queens are excellent versus Hellions. The problem is Queens are too slow to chase down Hellions, so you have to block your ramp with Queens in order to prevent the Terran player from hitting both your natural and your main in a single Hellion attack. You can make artificial walls as well with Evolution Chambers and Queens to protect the natural. In other words, build 2-3 Evolution Chambers in a line at the most narrow part of the entrance

to your natural expansion. Place 1-2 Queens in the gap between the buildings on Hold position and you now have an impermeable wall.

Queens are also needed to spread the creep. You must connect the creep from your main base to your natural expansion if you want to reasonably defend against Hellions, otherwise Queens would not be able to easily move from the natural expansion to the main to help defend against Hellion drops. Creep serves a variety of functions and should always be spread, but it is especially important versus Hellions. You cannot adequately stop these attacks if you are not spreading the creep. If you took a very early third and do not have time to spread the creep to your third base before you expect Hellions to attack, drop 2 Spine Crawlers at your third base. Even if the attack never comes, it never hurts to have some automated defense at your satellite bases.

One little-known trick is that 1 Queen and 1 Creep Tumor can be used to block a narrow ramp. When a Creep Tumor is just planted, during the approximately 8 second window where the Creep Tumor is burrowing, the Creep Tumor actually has a physical presence and cannot be walked over by regular units like the Queen or Hellion. It has space like any other ground unit or structure. This means that if you place a Creep Tumor on a narrow ramp, a single Queen can stand beside it to block the ramp temporarily. Of course, when the Creep Tumor burrows, the ramp will no longer be blocked, but you only need to block the ramp for a few seconds.

As an example, imagine the Terran player drops 4 Hellions in your main base, and you have 4 Queens. Typically, Zergs would send 2 Queens after the Hellions, and keep 2 Queens to block the ramp, preventing the Hellions from escaping. Instead, with this strategy, you can send 3 Queens to chase the Hellions around the main, and 1 Queen to sit on the ramp. When the Hellions head to the ramp to try to run into the natural expansion, you drop a Creep Tumor just before they get there, effectively blocking them in. The Hellions will then be sandwiched between the 1 Queen blocking the ramp and the 3 Queens that were chasing them around the base, inevitably resulting in their death with minimal losses on your part.

On some maps, the ramp from the natural into the main is very wide. On these maps, you will want to plant 1 Spine Crawler in the natural expansion mineral line and 1 in the main mineral line if you scout Hellions. It will be too hard to block a wide ramp so you need the high DPS of the Spine Crawlers to just kill the Hellions before they can do too much damage. Remember that it is okay to invest a few hundred minerals into 2 Spine Crawlers to stop 4-6 Hellions. After all, the Terran player will have spent 400-600 resources on those Hellions plus slowed down their own economic progression in order to get these units out and across the map in a short time!

Getting Rid of Offensive Widow Mines

There are two ways Terran players use Widow Mines on offense in the early game versus Zerg: running them into your mineral line and burrowing them, or placing them on the edge of the creep, especially at

a choke point, creating a contain on the Zerg player. Dealing with either of these situations is not difficult, though many Zerg players get stumped by such strategies the first time they see them.

The first scenario where the Terran player runs Widow Mines into the mineral line of any of the Zerg bases can be stopped easily by good fundamentals. Namely, if you are diligent about spreading your creep, have Overlords placed in appropriate positions for scouting, and have a healthy number of Queens, the Widow Mines should never actually get to your mineral line and burrow before you kill them. Widow Mines take 3 seconds to burrow. Queens and Zerglings can take them down quickly if they are in position.

If you are taking heavy damage from Widow Mines running into your mineral lines, then you simply need to work on your fundamentals more – spreading the creep, placing Overlords in the right spots, getting out Queens and paying attention to the mini-map. If you have read the beginning of this book, this is done by practicing your build. Placing Creep Tumors, Overlords and producing Queens should be part of your build. Paying attention to the mini-map to spot the Widow Mines incoming is a million times easier if your build is automatic. If you are not dedicating a lot of brain space to your macro (because it is an automatic pattern), you will start noticing all sorts of things on the mini-map. If you can spot the Widow Mines rolling across your creep or past your Overlords, you can get Queens and a few Zerglings in position to prevent the mines from ever reaching your mineral line.

Should you mess up and allow a Widow Mine to get into your mineral line, pull your Drones away and make a Spore Crawler. Once you have the detection of a Spore Crawler, you can take out the Widow Mines with Zerglings. In order not to lose mining time, you can use an Overlord or Queen to safely proc a Widow Mine without actually losing a unit. You can put your Drones back to work, as a Spore Crawler only takes 30 seconds to construct, whereas a Widow Mine takes 40 seconds to be able to fire again. That 10 second window is plenty of time to take down the Widow Mine(s) once detection becomes available.

While you can prevent Widow Mines from getting into your mineral line, you cannot prevent the Terran player from burrowing Widow Mines at the edge of your creep. Terran players may do this at choke points to gain map control, blocking any exit on the ground. There is only one way to deal with this: get out a Spore Crawler. Build the Spore Crawler in a safe spot, then uproot it and walk it down to the edge of your Creep where the Widow Mines are. Widow Mines do not target buildings, so this is an easy fix.

Deflecting Widow Mine Drops

In the mid-game, Terran players may take to dropping Widow Mines in your mineral line. This is really uncommon against Zerg, as Widow Mines just are not effective to use against a prepared Zerg. You should be thanking your opponent if that is what they are dropping, because Hellbats are more cost effective and Marines are more dangerous.

All you need to stop a full Medivac full of Widow Mines is a single Spore Crawler and Spine Crawler in each mineral line. Once the Terran player has started loading up Medivacs for drops this is something you will want to get anyway, so it is not as if you have to go out of your way to defend against Widow Mines. A Spore Crawler can provide detection for an entire expansion. If the Widow Mines drop outside of the Spine Crawler's range, just uproot the Spine Crawler and move it in range. Move your Drones during this process to save them from getting hit.

Even though you lose some mining time, 4 Widow Mines and 1 Medivac costs a total of 400 minerals and 200 vespene gas. Taking out a drop like this with no to minimal losses is a nice way to give yourself an edge in the "units lost" category. You will rarely see Terrans drop Widow Mines for this reason. It is more cost effective to drop Marines or Hellbats. The Spine and Spore Crawler will help against these drops as well.

Deflecting Hellbat Drops In the Early Game

As an alternative to Hellion harass, it is common for a Terran player to start dropping off 2 Hellbats in a Medivac right 8:00-9:00 mark (faster with a 1-base build). The primary difference between 4 Hellions and 2 Hellbats and a Medivac is that the Hellbats are slower and less dangerous to Drones (but still very dangerous), but also a lot beefier and more dangerous to Queens and Zerglings. Hellbats will stand and engage your Queens and can kill them if you are not careful.

If you are macroing hard in the early game, you may only have Queens and Zerglings to defend yourself against this kind of drop. The trick is to simply run your Drones away from the Hellbats while using the Queens to pick off the Medivac first. Queens have low DPS and simply cannot take down a high-HP Hellbat very easily through Medivac healing. Once the Medivac is down, 4 Queens can easily handle Hellbats. Typically the Hellbats will try to chase your Drones for awhile before turning on the Queens, so the Medivac is often a free kill. If you try to focus down the Hellbats first, it will take you forever to kill them and they will likely kill a lot of Drones in the process. Two Hellbats and a Medivac can easily turn on up to 4 Queens and take them out if the Medivac is able to sit there and heal them uninterrupted.

Hellbats are less dangerous than Hellions to Drones because Hellbats are too slow to catch Drones. This does not mean that Hellbats will not kill all your Drones if you are not very fast about moving, because they certainly will. When you see Hellbats, simply run away from them with your Drones, and never stop moving. If you use your Queens to kill off the Medivac, the Hellbats will never catch up to your Drones. Hellions on the other hand can chase down and quickly kill fleeing Drones.

If you get caught in the horrible position of facing 1 (or more) Hellbat drops when all you have is a Spawning Pool, you need to quickly get Spine Crawlers in each of your mineral lines. Even if you have 3 bases up and a 20 harvester lead in the early game, you can easily lose to just 4 Hellbats and 2 Medivacs if you do not take fast action.

A single Spine Crawler plus a Queen can deflect 2 Hellbats and a Medivac, so this is not a huge investment. If the Hellbats have already dropped and are currently attacking and you have no automated defense, you may need to simultaneously build a few Spine Crawlers in the base currently under assault, because the Hellbats may kill a few Spine Crawlers while they are being built. You can also build Spine Crawlers in a safer location and once they are built, walk them into the mineral line under attack and then burrow.

Scouting at the 6:00-7:30 Mark

If your Terran opponent is even halfway good, there will be Marines at the front door preventing you from peaking around their base with Zerglings. However, knowing what your Terran enemy is planning is crucial to your success if your plan is to macro up for as long as possible.

The most reliable method for figuring out what your opponent is up to as the game transitions into the mid-game is by sacrificing an Overlord or two in order to scout out the opponent's base. You should send your first Overlord to a safe spot by the natural expansion, off the map so you cannot be killed by Marines but close enough so you can keep an eye on the natural expansion. Meanwhile, your second Overlord should float just outside the opponent's main base.

When you send in these two Overlords depends on whether or not your opponent has their natural expansion up and running. If the opponent is not mining from their natural expansion by the 6:00 mark, something is fishy, and you need to send in your Overlords on a suicide mission to figure out what is going on. Typically you will find that cloaked Banshees or another 1/1/1 type of all-in is coming. This will give you time to prepare for it. This is more common in the lower leagues.

A more likely scenario is when your opponent is mining off their natural expansion by the 6:00 mark. In this case, you do not want to scout just yet, as your opponent likely does not have the resources required to reveal their tech. Instead, you want to wait until about 7:30 before going in with your Overlords.

You need to work these 2 Overlord losses into your build. While you want to keep them alive if possible, the Overlord's staying alive should be secondary to scouting. Do not skip over critical parts of the Terran infrastructure if you have not yet seen your technology just to keep your Overlords alive. You are practically guaranteed to lose 1, and you may lose both.

The trick to making these two Overlord losses not hurt is that you should count on losing these 2 Overlords as part of your build. You should have an extra Overlords worked into your build by the 6:00 and two by the 7:30 mark so you do not get supply blocked if you lose your Overlords to scouting.

Corruptors vs Medivacs& The Importance of Upgrades

One of the keys to beating Terran players that are going very heavy on bio/Medivacs is to mix in a handful of Corruptors to take out the Medivacs. Without perfect Fungal Growths, Baneling hits, and possibly a superior unit composition (i.e. lots of Ultralisks versus mostly Marines, or mostly Zerglings versus a lot of Marauders, Brood Lords if there are no Vikings), Zerg armies are unable to go toe-to-toe with a Terran bioball if the Medivacs are the last units to die.

While it is true that Corruptors cannot attack ground units after they kill the Medivacs, you have to remember that the Terran player has invested extra supply in Medivacs which also cannot attack anything. You can afford to get out 1 Corruptor for every 1-2 Medivacs on the field. It takes 6 Corruptors to 2-shot a Medivac, so this is a good number to shoot for. You may need a few extra Corruptors if there are 10+ Medivacs or Vikings mixed in to the army. Again, if the Terran player has 10+ Medivacs and 5+ Vikings, they are going to have a much smaller bioball on the ground, so you can afford to dedicate more supplies to Corruptors.

Since Corruptors can only hit air units, they will preferentially target Medivacs. You can focus fire down the Medivacs, but even if your micro is poor, the Corruptors will target the Medivacs anyway since there is nothing else they can attack. Once the Medivacs start dying off, the resilience of Marines decreases massively. With no healing support, using Stim significantly weakens a Marine, preventing them from fighting any prolonged engagement.

Corruption can be used as well to boost the Corruptor's damage, though you may be busy microing your other units, so this is not a high priority skill on non-massive units.

The added bonus of killing Medivacs early is that once the Terran loses the fight, they cannot scoop up their remaining units and Ignite Afterburners to safety. A common Terran strategy is to use mass Marine and Medivac, trade Marines with the Zerg army, killing Banelings, Infestors, and Mutalisks in the process. Even if the Zerg comes out slightly ahead, typically a big Zergling reinforcement wave is needed before the Terran's forces are overrun. The Terran then scoops up their remaining units and boosts their Medivacs to safety. Even if the Terran loses a lot of Marines in this type of engagement, the Zerg has to spend gas while the Terran does not. MULEs give the Terran a lot of expendable minerals, while there is no such thing as expendable gas for Zerg (or any race). This is not a fair trade and it eventually wears the Zerg down. If Corruptors are killing Medivacs, the Terran is losing gas each time a Medivac goes down. They also cannot scoop up their straggling units if there are no Medivacs alive left to do so!

If you find that your Corruptors die too quickly and are unable to take down Medivacs, odds are your problem is upgrades. In order for this to work effectively, your air armor upgrades cannot be more than 1 point behind behind the Terran player's ground weapons upgrade. It becomes exponentially more effective if upgrades are equal, and becomes practically unstoppable if you manage to get an upgrade advantage (though this is hard given that Spire is tier 2 and Engineering Bay is tier 1).

The reason for this is that a +0 Marine deals 6 damage per shot, whereas a +3 Marine deals 9 damage per shot. Meanwhile, a Corruptor has 2 default armor. This means a +0 Marine will deal 4 damage per shot to a +0 Corruptor. Given that a Corruptor has 200 HP and Marines attack every .573 seconds (with Stimpack active), this means a Marine with equal upgrades to the Corruptor will take about 29 in-game seconds to kill a Corruptor! This is a lifetime in a Starcraft 2 battle. Given that a Corruptor has double the supply of a Marine, even if you consider two Marines, this is still about 14 seconds of in-game time. The Terran player simply cannot focus on the Corruptors for this long if there are Zerglings, Banelings (or even Hydras and Roaches) on the ground.

Things change significantly when there is an upgrade disparity. +3 Marines will deal 7 damage per shot to a +0 Corruptor. This means that a 0/0 Corruptor will die almost twice as fast to a 3/3 Marine as a +3 Corruptor. A pair of 0/0 Marines takes 14 seconds to kill a +0 Corruptor, whereas a pair of 3/3 Marines only takes 8 seconds to kill a +0 Corruptor! If there is an upgrade disparity of more than 1, it suddenly becomes viable for the Terran player to focus down your Corruptors that are supposed to be sniping Medivacs. Many Zerg players often end up in this exact situation. Terrans going full bio are typically very diligent about getting Infantry Upgrades, whereas most Zerg players are very lazy about getting air upgrades. If you are tight on gas, you do not have to get weapons upgrades to stand a chance as Zerg air. The armor is much, much more important.

Meanwhile, if you manage to actually get ahead in upgrades, a +1 Corruptor takes 19.1 seconds to be taken out by a pair of 0/0 Marines with Stim. A +2 Corruptor takes 28.65 seconds to be taken out by a pair of 0/0 Marines! If you can get to this point, you can easily win the game just by using your practically invulnerable Corruptors to take out any Medivac while your ground units can completely shut down Marine/Marauder without support. Getting to this point though typically requires you to snipe the Engineering Bays. This can be done with Mutalisks or drops though, and if you can kill the Engineering Bays once or twice throughout the course of the game you may set yourself up for this situation.

The point here is that you cannot afford to skip +air armor if you are playing a bio-focused Terran. Marines scale incredibly well with +weapons upgrades, and each point of air armor completely negates this upgrades.

Spreading Creep& Overlords to Stop Drops

Terran players love to drop, especially versus Zerg players. The easiest way to stop this is to see it coming before it gets there. Creep provides vision, so be sure to extend the creep to the very edges of your base, especially at the main, to spot Medivacs a second or two earlier.

It helps to place Overlords in the drop lanes as well, but good Terran players use Vikings to clear these out. Terran players are not clearing out Overlords to get a few free Overlord kills – they are doing it in order to prevent you from seeing their drops from coming. If a Terran player starts sending out a Viking to clear your Overlords, prepare for a drop. Spreading Creep is important because it is not nearly as easy

to clear out as Overlords. However, it also does not provide as much vision, at least early in the game before you can take over large portions of the map.

You may want to consider getting a few Mutalisks out and using them to defend your Overlords if the Terran is really aggressive with drops. Mutalisks are very strong versus Vikings and are fast enough to chase them down. Terran players typically only use 1-3 Vikings to snipe Overlords. They do not want to over-produce Vikings because they are really only good versus Corruptors and Brood Lords.

Once you destroy a Viking or two that is picking off your Overlords, you can safely replace your Overlords in drop lanes. Even if this may seem like a small victory, this will frustrate the Terran player to no end and will throw him off his game. Terran players below Master's league may stop dropping altogether if they feel like they cannot stop your Overlords from getting vision.

How to Spot Full Mech Builds

Terran players have a multitude of options to use against Zerg players, including both bio, mech, air, or bio-mech. You can spot if the Terran is going with a full-on mech build by checking out their Marines. If it is getting to be past the 10 minute mark and there are still 0/0 Marines without Combat Shields (i.e. they have 45 HP instead of 55 HP), the Terran player has no interest in getting a bioball out anytime soon. If there are no combat shields, expect Siege Tanks, Thors, Widow Mines, Hellbats, and possibly air units.

If you see Marines without a single weapon/armor upgrade PLUS no combat shields by the 13:00 mark, prepare for full-on mech or air. We will discuss how to handle mech builds below, and air builds in a few sections down. Before addressing how to counter either of these builds, we should discuss how to deal with Widow Mines

Triggering Widow Mines

Widow Mines can devastate Zerglings and Mutalisks if left unchecked. You always want to trigger them before going in with your main army to make sure you do not lose too many in a handful of explosions.

The cheapest and safest way to trigger Widow Mines is through the use of either Infested Terrans or Locusts. The Infestor can spawn these safely from range, and the Widow Mines will proc on these. You can also spread them over a wide area. Since this ability has a range of 9 and Widow Mines proc within 5 yards, this gives you the ability to proc Widow Mines safely from a range of up to 14. You should always do this before going in for a major attack.

Infested Terrans have the added advantage though of turning the Widow Mine's damage against the Terran player. The reason is that if you throw Infested Terrans into the opponent's army, Widow Mines

will trigger and hit those Infested Terrans, dealing the Widow Mine splash damage to all the Terran units within explosion range.

The Swarm Host's Locust can proc Widow Mines from an either further distance, as free Locusts will trigger Widow Mines. However, if you send in a wave of Locusts first to trigger Widow Mines, that means they will not be there to fight when you want to go in with your army. For example, imagine you had two 100-supply armies, called Zerg Army "A" and Zerg Army "B". Imagine army "A" has 16 supplies invested into Infestors, whereas army "B" has 16 supplies invested into Swarm Hosts.

If army "B" sends in the Locusts from the Swarm Hosts to proc the Widow Mines, loses the Locusts, and then attacks, that army will actually only have an effective supply count of 84 supplies, as the Swarm Hosts are not contributing again until the Spawn Locust timer resets. On the other hand, if the Infestors drop a handful of Infested Terrans to proc the Widow Mines, they still have plenty of energy left and can immediately contribute to the battle by dropping Fungal Growths or more Infested Terrans. Zerg Army "A" has an effective supply count of 100 supplies.

Locusts are better at just whittling down mech armies in general, as Thors, Hellbats, Siege Tanks and Widow Mines are weak versus Swarm Hosts. Rather than trying to use Locusts to proc Widow Mines, consider a constant Locust barrage on the fortified Terran position. It is very annoying for a mech player to stop these assaults, since they have to unsiege all their tanks and unburrow all their Widow Mines as well as leave the defensive confines of their Planetary Fortress(es) if they want to push forward to stop this attack from happening.

If you do not have Infestors or Swarm Hosts, you can use Zerglings or Overlords to trigger mines. Just send in a handful of Zerglings to proc the mines and sacrifice them. It is okay to lose a 25 mineral-cost Zergling if it results in proccing a Widow Mine. What is not okay is when you lose 12+ Zerglings to a single Sentinel Missile because you did not proc the mines before going in for the attack.

It is also worthy to note that Widow Mines take about 2 seconds to proc and land. If you can run Zerglings into the opponent's unit ball, the Widow Mines will proc, follow your Zerglings, and blow up on the opponent's units. Banelings work well for this too, since the Baneling explosion damage hits all enemy units including burrowed Widow Mines. You can also try to guess which Zergling(s) are being targeted by the Sentinel Missile and try to pull those out or split up your Zerglings before the explosion hits. This is very difficult to do but a very effective strategy and commonly used at the pro levels.

If you are maxed out and have a lot of minerals, and do not want to sacrifice units that cost supplies, you can use Overlords. Get together about 10 Overlords and fly them in slightly ahead of your army. They will absorb the Widow Mine hits in addition to distracting your opponent. Your opponent may even try to focus them down thinking that they contain units as part of a doom drop. You just have to make sure you send your army in literally 1-2 second behind the Overlord cloud, as you do not want to lose the Overlords without getting anything out of it given that they cost 100 minerals a piece.

To actually take out Widow Mines, just make sure you bring a handful of Overseers with your army. One is not enough, as you cannot risk the Terran player focusing it down, leaving you defenseless against mines. Once the Widow Mines have safely been procured in one of the many manners described above, you can kill them off quickly with any unit.

Protecting Your Brood Lords

Brood Lords are an excellent unit choice against any ground-heavy Terran army. However, their primary weakness is the Viking. Against a mech-based Terran, Mutalisks and Corruptors are typically all you need to protect your Brood Lords. Corruptors are beefy enough to fly right in and attack the Vikings directly if there is mostly Siege Tanks and Hellbats on the ground. Corruptors can absorb a few Thor shots too so this is not a major concern.

However, Mutalisks and Corruptors alone may not be enough if there are large numbers of Vikings or large numbers of Marines on the field. It is too easy for Vikings to take a few shots from their range of 11 at your Brood Lords, then kite backwards over a Marine/Widow Mine ball, repeating this process until all the Brood Lords are dead. Bio Terrans typically have better upgrades than Zerg Air will, so Mutalisks and even Corruptors can become vulnerable to Marines. Also, if there are enough Vikings out, they will be able to 1-shot Brood Lords which can be very painful as well.

The solution in both these cases (aside from an overall tech switch) is to mix in a few Infestors for Fungal Growth. The goal here is to trap Vikings that are attacking your Brood Lords with a Fungal Growth. You only need 1 good Fungal Growth for your Mutalisks and Corruptors to take out an entire fleet of Vikings. With no Vikings in the sky, Brood Lords will rule over everything the Terran has on the ground.

Punishing the Terran Third/Fourth with Zerglings

When a Terran takes a third (or higher) base in Zerg versus Terran, you need to punish players who get Orbital Commands instead of Planetary Fortresses. If there is no Planetary Fortress, this base suddenly becomes very vulnerable to Zergling attacks. You should be sending a stream of Zerglings into any third (or fourth or fifth) Terran base which has not been turned into a Planetary Fortress. You can then rush down as many SCVs as possible during this time.

Of course, some Terrans will defend their third heavily with Widow Mines and Siege Tanks, which may make it more difficult to harass their Orbital Command. This is fine, as the process of defending this expansion slows down the Terran's macro. Just pay attention to the fourth base though – if that is an Orbital Command as well, this is a major weakness that you must exploit. The Terran cannot defend both bases if neither has a Planetary. If the Terran splits their forces between the expansions, that means each army will be vulnerable to an attack from your full army.

Defeating Mid to Late Game Terran Mech Builds as Zerg

One of the biggest complaints of Zerg players is that it is very hard to beat a Terran player who masses out on mech units, even if they are just Hellbats and Thors. This requires little micro from the Terran player but is devastatingly effective against a Zerg that is still on tier 2 units.

I will admit that this is difficult to stop, however it can be done with the right strategy, unit composition, and upgrade selection, it can be done reliably.

The big problem with running into Hellbat/Thor (and possibly Siege Tanks) is that Hellbats destroy Zerglings, fair decently against Roaches and Hydralisks, and even trade well with Banelings. Thors on the other hand in sufficient number do well against Roaches, Mutalisks, and Banelings, and trade reasonably well with Hydralisks. Zerglings are strong against Thors (if upgrades are the same), but Hellbats are so completely dominant against Zerglings that it more than makes up for this minor Thor weakness.

The end result is that the Zerg player either needs to use their utility units or go up to tier 3 in order to battle this army composition. Ultralisks will shred Hellbats, but are somewhat weak against Thors. Brood Lords on the other hand are strong against everything mech has to offer, but they are such a high tier unit, it is not realistic to get them out before the Terran switches into SkyToss.

So what is a Zerg to do? Let's discuss the best strategies below.

Do Not Use Banelings vs Full Mech Terran if You Are Not Going to Win or Gain a BIG advantage With the Attack

A long title, I know. Before discussing anything else, I strongly recommend not investing into Banelings against a full mech Terran unless you have a major economic advantage. Zerg players love their Mutalisk/Zergling/Baneling combo, but it simply does not work once the mech Terran has a strong economy. Sure, you can go for an early game Roach/Ling/Baneling bust and win games, but once the Terran player gets their economy rolling, you can no longer use Banelings against full mech builds. Of course, if the Terran is mixing in a lot of Marines, feel free to use Banelings. This section is specifically discussing full mech Terran play.

It may be tempting to think Banelings are good against Hellbats since Hellbats are light units, but this is not the case. The reason is Hellbats have 135 HP. It takes 4 Baneling hits to kill 1 Hellbat! Hellbats are also much larger units than Marines, so you are going to hit less Hellbats with a single explosion. Hellbats with +1 weapons will 1-shot Banelings as well, causing them to explode in such a way that their splash radius does not hit most of the Terran army.

The real problem though is that 1 Baneling costs 25 gas and 50 minerals (25 from the evolution, 25 from the Zergling). This is very expensive for a unit that only costs half a supply. A Hellbat on the other hand

only costs 100 minerals and no vespene gas. If you trade 4 Banelings to destroy 1 Hellbat, you have just spent 100 vespene gas and 200 minerals to kill a 100 mineral unit. Even if the Banelings take down some extra Hellbats, you cannot afford to trade gas for minerals with the Terran player.

If the Terran player is using mineral-only units and destroying your units that cost gas, you are in big trouble! The strategy below for beating mech builds relies heavily on gas, so you cannot waste it early on Banelings just to combat Hellbats.

The Right Army Composition for Beating Hellbat/Thor/Tank

Most Zergs run into trouble with mass Hellbat and Thor in the mid-game. The bottom line is that this is strong against all Zerg default ground units. Mass Roaches fair okay versus Hellbats and Thors, but if there are a few Siege Tanks in the mix, this is no longer viable.

The best option here is to get out Mutalisks off of 3 bases in the initial phases of the mid game. These can be used to deflect early mass Hellbat and forces the Terran player to spend some of their gas on Thors. You want your Terran enemy to have to spend as much of their gas as possible, because this prevents them from teching into air as well as slows down their upgrades, the extreme importance of which is discussed below.

Once the Terran player has out 3+ Thors, Mutalisks can no longer engage the Terran army directly. They are not worthless though, as they can be used to shut down Medivac/Hellbat drops, pick off lagging Siege Tanks, and harass the Terran main, and ideally pick off an Armory.

Once the Thor count gets high, you have two options: Brood Lords or Swarm Hosts, and which option you choose should depend on the opponent's production facilities and your level of vespene gas.

Teching Up to Brood Lords to Stop Mech

If you have a 1 (or more) base lead over your opponent **and** your opponent has 2 Starports or less, you can win the game outright by making a tech switch into Brood Lords. This is the superior option to Swarm Hosts, but only if these conditions are met.

Just 6 Brood Lords can handle even a huge mech army, as long as you hide your Brood Lords until you are ready to attack. If the Terran does not have more than 2 Starports, they simply will not have the production capabilities in time to get out enough Vikings to stop this attack, no matter how many minerals they have in the bank. Make a handful of extra Corruptors and use your leftover Mutalisks to defend your Brood Lords. Mutalisks can help pick off Thors (magic box, discussed previously), whereas Corruptors can be used to chase any Vikings away from your Brood Lords.

Once you have cleaned out the opponent's ground army, you can send in a reinforcement wave of Zerglings. The Terran player will likely be frantically working on getting out Vikings, Missile Turrets, and Thors. Hellbat production will be cut in favor of anti-air. This works out great, because you can then send in a wave of Zerglings that will easily destroy Thors and Missile Turrets, as well as SCVs and the entire Terran's base in general. While the Terran may hold off your air attack, the reinforcement wave of Zerglings is the real game-ender.

This only works if you have an extra base over your opponent or when your opponent is being extremely risky in their lack of anti-air. Brood Lords, even in small numbers, cost a lot of gas. This is particularly the case if you spend some gas on Mutalisks plus get out some extra Corruptors to defend against Vikings. This is why it is very important not to waste your gas early in the game on Banelings against full mech builds. You need to save it for the high tier units.

Additionally, if your opponent strangely has out 3+ Starports at this early stage in the game, this transition will not work. If your opponent has this many Starports though, they are practically going to have nothing to stop your Mutalisks. There just is not enough gas to go around for a Terran player on 2 bases for them to invest into an armory, a few Factories for production, Thors, and still have gas leftover to build a handful of Starports. Early Mutalisks force Terran to spend their gas on Thors, which is why I recommend getting them out against Factory play in the first place.

The key is to surprise your opponent with an overwhelming number of air forces before they can get enough Vikings (or infrastructure to produce Vikings). If you already have out about 12 Mutalisks, and you suddenly reinforce this with 6 Brood Lords and 12 Corruptors, a full mech Terran army can quickly lose the game. The key is to go right for the main base with your surprise attack so the Terran cannot get out an extra Starport or two. If you just show up with a few Brood Lords and no air back-up, then the Terran will be able to get out enough Vikings and Thors to push your attack back and the surprise advantage is completely wasted.

Teching to Swarm Hosts to Stop Full Mech

If your initial Mutalisk harass did not go well and you lost too many Mutalisks (and hence vespene), if you lost a Hatchery to a Terran drop, or for some other reason you and the Terran player are on an equal number of bases, you should start getting out Swarm Hosts. This is a much more vespene-efficient manner of combatting mech. Swarm Hosts are "the" counter to all Terran mech. Terran mech is so slow that it is extremely vulnerable to the Swarm Host's Locust, should you micro appropriately.

The trick to using the Swarm Host is to find an appropriate position to engage the Terran player. The best option is typically to entrench yourself where the Terran player would put their third base. You can even add in a few automated defense structures if you can spread the creep with Overlords and a Queen (bring the Queen to the creep generated by the Overlords and plant a CreepTumor). If they

already have a third base, park yourself where the fourth base would go and siege the third base (or natural, depending on map layout) from here.

This works really well because the Terran player needs to get their third (or fourth) base eventually, so they will want to come to the Swarm Hosts. You cannot stop Locusts from dealing at least some damage with mech without at least taking some damage if the Terran is the aggressor. The Terran player has to attack as well, because they are unable to afford not taking their expansion.

You do have to micro your Swarm Hosts, and you want to spread the creep back to your main as quickly as possible. Generally, the best Zerg players will burrow their Swarm Hosts, spawn a wave of Locusts, and should the Terran player give any inclination that they want to attack the Swarm Hosts, the Zerg will unburrow and run them away before the Terran ever gets in range. As soon as the cooldown is off, you can burrow the Swarm Host again, spawn Locusts, and follow the Locusts back in to the position you just fled from. This in-and-out style attack prevents your Swarm Hosts from getting killed. Burrowing your Swarm Hosts among static defenses also gives an extra level of protection.

The only downside to this approach is it is not typically a “game ender” like the Brood Lord tech switch. It is something you can use to get ahead in the game, starving out the Terran while you expand the map. Your goal during this phase is not to win the game, but rather make the Terran spend their gas, to prevent them from expanding, and try to force them to delay their upgrades, either through pressure or sniping the Armory.

If the Terran player is halfway decent, they will transition into SkyTerran in the late game. Swarm Hosts cannot attack air units, so a tech switch into Battlecruiser/Vikings/Ravens/Banshees (or any combination of the 4) is a viable option for the Terran player at this point. You have to be careful not to make too many Swarm Hosts so you do not get surprised by this. A good rule of thumb is to limit yourself to a maximum of 2 Swarm Hosts per Thor. Any more than that and you are setting yourself up to lose to a tech switch.

Why does this work so well? Because SkyTerran costs a lot of Vespene gas! If the Terran is on two bases, there is only a maximum of 10,000 vespene gas available to them, not to mention it takes almost 21 in-game minutes to mine out a fully saturated geyser. Between gas spending on Factories, Tech Labs, Reactors, Armories, Widow Mines, Thors, upgrades and technology, there is only so much gas leftover to build Starports and then invest in SkyTerran. A doom fleet of 10 Battlecruisers and 10 Ravens costs 5,000 gas – a Terran player simply does not have enough gas to start as mech and transition into mass air on just two bases. Even on 3 bases, such an attack would not come until the very late game. It really takes 4 bases for the Terran to effectively switch into SkyTerran. The goal of the Swarm Host attack is to prevent that 3rd or 4th base from coming up.

If you can keep the Terran player off their third base even for just a few minutes, that is all you need to really combat Terran mech or SkyTerran transitions. During this delay time, you need to take your fourth and fifth bases, defending each one with 2 Spine Crawlers and a Spore Crawler to prevent the Terran from clawing their way back into the game with drops. Additionally, you should focus heavily on

upgrades – particularly Ground Missile Attacks, Ground Carapace, and Flyer Carapace. Swarm Hosts, Roaches, and Hydralisks all benefit from the ground upgrades, whereas you need Flyer Upgrades just in case you have to switch into air.

A good army composition to use to deal with mech once you have built this advantage for yourself with the Swarm Host is to supplement your Swarm Hosts with mass Hydralisks, Roaches, and a handful of Vipers. Vipers can abduct Thors and Siege Tanks into your Hydralisk/Roach/Locust ball. With no Siege Tank or Thor support, Hellbats are worthless against Locusts and Hydralisks (with the +range and +speed upgrade, of course). The Hydralisks will also add an extra layer of defense against the small number of Banshees or Battlecruisers. Vipers can also use Blinding Cloud on Siege Tanks, giving your ground units another layer of support.

Do not over produce Vipers against Mech. They cost 3 supplies each. Players too frequently get out 5+ Vipers thinking that they need a lot of Abducts. Unfortunately, if you have invested 15+ supplies into Vipers, that is 15+ supplies worth of Hydralisks and Roaches that will be missing from your army. Instead, you need to rely on just 2-4 Vipers, using Consume to keep their energy up. Place a few Evolution Chambers down near the battle lines and drain them to keep your energy up.

Remember you do not have to win the game outright in one big push with this strategy. Each Thor is 200 vespene gas and each tank is 125 Vespene gas. If the Terran player is only on 3 bases, their gas will be a very limiting resource. If you snag 5 Thors, you just destroyed 1000 of their very limited vespene gas. Snag their high value units a few times in a row and the Terran will be weak enough to engage directly.

The Zerg vs Terran Upgrade Problem

One of the most important aspects of the Zerg vs Terran dynamic is that Terran players are almost always ahead of the Zerg player in terms of upgrades. The reason for this is that Zerg players almost always use all types of their air and ground units in a game, whereas Terran players typically only have to focus on 2-3 upgrades.

For example, at a bare minimum, a Zerg player will use Zerglings and Mutalisks against a Terran player in practically every match-up. This means they need to upgrade melee weapons, ground carapace, flyer attacks, and flyer carapace to keep up with the Terran. A Terran player going full bio on the other hand only needs to focus on Infantry weapons and armor. A Terran player going full mech only has to focus on Vehicle Weapons and Vehicle/Ship armor (armor upgrades are combined for the Terran in Heart of the Swarm). A switch from mech into full Sky Terran only adds Ship Weapons to the required upgrades, as they will already have the armor upgrades from their mech opener.

As a result, Zergs tend to have to invest about twice that of Terran players in order to stay on par with upgrades. It is not so much that Zerg players cannot afford this extra investment (they can because they should have an extra base over the Terran) but rather that this extra resource investment seems to put

up a barrier that makes Zergs think of upgrades as not a priority. Meanwhile, since it is easy for Terran players to upgrade, Terran players typically go out of their way to get upgrades early. The end result is that Terran players are almost always ahead of their Zerg counterparts in the upgrades department.

The manifestation of this problem depends on the unit choice of the Terran player. The Zerg's response to each depends on which types of upgrades the Terran player is pursuing.

Bio & SkyTerran

When dealing with Bio & SkyTerran, an upgrade advantage for the Terran player is very difficult to overcome as a Zerg. However, if upgrades are equal, this is not a strong advantage. Marines and Battlecruisers are in the same boat when it comes to upgrades. Both units have a fast attack with low damage that becomes much stronger with each upgrade point. However, this is completely mitigated by equal armor upgrades on the other side. A +0 Marine does 6 damage (before base armor) to a +0 enemy unit, and a +3 Marine still does 6 damage to a +3 enemy unit.

The same goes for armor upgrades. You do not want your weapons to fall behind enemy armor, because bio and SkyTerran scale well with these upgrades against the Zerg units that perform well against them. Marines and Marauders with a +1 armor advantage over the Zergling's attack take significantly reduced damage. This is amplified by Medivac support, as lower enemy DPS means it takes longer to kill the targeted unit which translates into extra time for each unit to be healed. Bio units with +2 armor and Medivac support are practically immune against Zerglings with no weapon upgrades.

The SkyTerran Upgrade Problem

Zerg units do fine against both Bio and SkyTerran if the upgrades are equal. The problem is that Zerg players running into a heavy Terran bio army tend to focus solely on Melee Weapons and Ground Carapace, whereas Zerg players running into a heavy mech army tend to focus on Missile Weapons and Ground Carapace. Flyer upgrades and the ground weapon for the unit type they are not using are a side thought. Even if the Zerg player is diligent about getting them, this is done on 1 Spire. Meanwhile, Terran players with an interest in SkyTerran almost always go for two Armories to pump out their upgrades faster.

Zerg players run into a big problem with 3/3 Battlecruisers appear and their Corruptors are 1/1 (or even worse, 0/0) and their Hydralisks are 0/3. A 3/3 Battlecruiser with Yamato Cannon will actually win outright versus three 1/1 Corruptors. Given that Corruptors are the Zerg's counter to massive air units, this is a big problem when the Terran can use massive air units that actually destroy the Corruptors. A +3 armor Battlecruiser will also take very limited damage against a +0 weapons Hydralisk. If the Terran has an upgrade advantage, there is no way to efficiently combat Battlecruisers.

If the Zerg falls behind in upgrades here, they are not going to be able to stop SkyTerran. The solution here of course is simple – keep your upgrades on pace with the Terran player. Get Flyer Carapace upgrades over attack upgrades if you suspect a transition into SkyToss. You should be getting these upgrades anyway as a few Corruptors works well against Medivacs.

The Mech Upgrade Problem vs Zerg

If you thought the disparity between Zerg and Terran upgrades could not be any worse based on that last section, guess again. The problem is actually *worse* against Mech.

The reason for this is the way mech units scale with attack upgrades. While Marines and Battlecruisers gain +1 damage from each point of Weapon Upgrade, mech units gain more.

For example, each time a Thor attacks ground units, it shoots 2 attacks that deal 30 damage a piece (60 total damage). With +1 Weapons, this is increased to 33 damage per shot (66 total). With +3 weapons, this is 39 damage a shot (78 damage per attack). The Hellbat gains +2 to its regular attack and +3 to its light damage attack.

Why is this important?

- **Thors** – A +0 weapons Thor needs 3 shots to kill 1 Roach. A +3 Thor will kill a Roach in just 2 hits, **regardless of Roach armor upgrades.**
- **Siege Tanks** – A Siege Tank with +0 Weapons needs 3 shots to kill 1 Hydralisk. A Siege Tank with +3 weapons only needs 2 shots to kill 1 Hydralisk, **regardless of Hydralisk armor upgrades.**
- **Hellbats** – A Hellbat with +0 Weapons needs 2 shots to kill 1 Zergling. They need 3 shots to kill a Locust. A Hellbat with +3 Weapons will 1 shot a Zergling and 2-shot a Locust, **regardless of Zergling or Locust Upgrades.**

Once the Terran player is at 3/3, Terran mech becomes much stronger, **even if the Zerg player is at 3/3 as well.** Thors suddenly become 50% more effective versus Roaches. Siege Tanks become 50% more effective versus Hydralisks. Hellbats become twice as effective versus Zerglings and 50% more effective versus Locusts.

As soon as 3/3 finishes for Terran mech, you can no longer engage the Terran army directly with ground units.

Roaches fair well against Thors until the Thors get +3 weapons, especially given the low gas cost of the Roach versus that of the Thor. Once the Thor can two-shot a Roach, 3 Roaches to 1 Thor no longer even a close fight – the Thors win. Zerglings can be used to snipe tanks and Thors, but once +3 weapons is out for the Hellbats, Zerglings will get 1-shot by Hellbats, making them ineffective even when trying to ignore the Hellbats. Even Swarm Hosts become a lot less effective when Hellbats kill Locusts in two hits.

With the splash damage, the Locusts will only get a shot or two off before dying, and that is assuming the Siege Tanks do not kill them off first.

In order to handle this discrepancy, the primary tactic you need to employ is doing what you can to stop the Terran's upgrades in addition to trying to get your own upgrades out. You still need to keep up with your upgrades (especially flyer armor, as Thor anti-air attacks are mitigated notably by Flyer Armor plus this protects you from a SkyTerran transition), but it is not as important as it is when dealing with bio or Battlecruisers. The reason for this is that a +2 weapons Thor still takes 3 shots to kill a +0 armor Roach. Meanwhile, a +3 weapons Thor will 2 shot a +3 armor Roach. The effectiveness of either unit is not changed by the Roach's upgrades in this scenario.

How might a Zerg player stop a Terran from getting upgrades? There are three primary tactics you can use, discussed below.

Applying Pressure

One of the best ways to keep a Terran player's mech upgrades from getting too high is to apply pressure. Use Roaches in the first 8 minutes of play, Mutalisks until about 13 minutes, then Swarm Hosts or Brood Lords. These units cannot easily be stopped without the Terran player spending some gas. If the Terran player has to get a lot of Thors or Tanks, that is less gas they have to dedicate towards an extra Armory and upgrades.

If you do not let up the pressure, the Terran will take a long time to get out 3/3. If they do get out 3/3, then they will not have enough Thors to handle a large number of Mutalisks.

Sniping Armories

The ideal scenario in delaying Terran upgrades is actually killing off the Terran player's Armories (or Armory). Lower ranked Terrans will laugh this off as it is happening, thinking that you are trying to disrupt Thor and Hellbat production. In reality, this is done to force the cancel (or loss) of the upgrade, costing the Terran valuable time.

If you can kill off an Armory, this delays the Terran's upgrade progress significantly. The Armory itself takes 65 seconds to build. There will be some downtime where the Terran player chases your Mutalisks away and sends the SCV to the right spot to rebuild the structure, so you can consider this to be a delay of about 80 seconds. Furthermore, level 1 weapons and armor each take 160 seconds to build. If you can catch those near completion (or even halfway), that is more wasted time for the Terran player.

You can easily set back a Terran player's upgrades by 3-4 minutes by killing off an Armory. This has the added bonus of setting them back 100 vespene gas which we have already established as a limiting factor for pursuing upgrades.

The easiest way to snipe an Armory is via Mutalisks. It takes 12 Mutalisks without +1 Weapons about 10 seconds to kill an Armory. This is faster than most Terran players will be able to respond. With 18 Mutalisks, the time invested drops to 7 seconds. Armories tend to be very easy to snipe as well since Terran players typically put them on the outskirts of their bases. You can fly in, kill the Armory and then fly out. It is worth losing 2 Mutalisks to take out an Armory.

If you can destroy the Armories two times in a game, you can get a major upgrade advantage over the Terran player and roll through them with an air-based army. Brood Lords, Corruptors, and Mutalisks cannot be stopped by a Terran player if the upgrade advantage for the Zerg disparity reaches two levels (i.e. 0/0 Vikings/Thors will always lose to 2/2 Mutalisks/Corruptors/Brood Lords).

Contaminate

Perhaps the easiest and most effective way to slow down Terran upgrades is through the Contaminate ability. This is the overlooked Overseer ability that prevents the targeted structure from researching or constructing units for 30 seconds. This means that if used on an Armory, upgrades will be halted for 30 seconds. This works well when used on Engineering Bays as well.

You will want to have about 5 Overseers total to keep Contaminate up on two Armories for an extended period of time. Fly into the enemy's base, drop Contaminate, then fly away and park the Overseers in a safe spot.

If the Terran player eventually responds by getting Vikings, this will put a relative end to your Overseer harass. If there are only a few Vikings you can use Mutalisks to protect your Overseers to keep the harass going. If the Terran player sends his units out of position to try to attack you, you can use the distraction to run in with your Mutalisks to try to snipe the Armory.

Stopping SkyTerran in the Late Game

In the worst case mech Terran scenario, you could not stop the Terran from securing their fourth base. Once this happens, the transition into SkyTerran is inevitable. Maybe the Terran did not open with mech, but instead played a very defensive style or bio and is able to go for SkyTerran on just 3 bases. Regardless, mass Battlecruisers and Ravens with a sprinkling of Vikings or Banshees is the name of the game and something Zerg players find very difficult to stop.

Mass Hydralisks alone do not perform well against SkyTerran, since Battlecruisers perform fairly against them, and Seeker Missiles are strong against Hydralisks. Mass Corruptors are strong against Battlecruisers, but are weak against the Raven's Point Defense Drone (PDD) as the Corruptor has a slow attack speed. Corruptors also cannot deal damage to ground units, and SkyTerrans often dump extra minerals into Marines or Hellbats, which will then be able to attack your base freely if you have nothing but Corruptors to defend yourself.

There are three keys to beating SkyTerran in the late game: upgrades, Vipers, and static defense.

- **Upgrades:** As discussed in the previous sections, you need to keep your Flyer Carapace at least equal to the ship weapons of the Terran player in order to have a chance against SkyTerran.
- **Vipers:** Use the Vipers for their Abduct ability. You can use this to pull Battlecruisers over your automated defense. You can also use this to pull Battlecruisers out of range of the PDDs.
- **Static Defense:** Spread the creep to at least mid-field. Plant approximately 10 Spore Crawlers and 10 Spine Crawlers spread out over this area, across the center of the map. The Terran player will have to fly past or destroy this in order to get across to your bases. If they try to fly around it, it means that there will be nowhere for ground units to walk. Corruptors perform well against Battlecruisers if there are no ground units for support. If the enemy tries to destroy your static defense, you can use your Hydralisks and Corruptors to attack the ground units as your Spore Crawlers contribute extra damage and health, giving you an advantage in the fight.

Your army composition should consist of Hydralisks, Corruptors, and Vipers. You only want to get about 4 Vipers total. This is enough to Abduct 8 Battlecruisers and more than enough for this strategy. Any more than that and you will be cutting into your supply count.

You need to make up for the fact that you have less supplies dedicated towards offensive units due to having Queens and Vipers. Spore Crawlers will fill this need nicely. Take this fortified position in the center of the map. Mass your Hydralisks, Corruptors, extra Queens, and Vipers at this location. From here, you can siege the closest Terran base. You can add a couple Swarm Hosts to the mix, supported by the static defense, to heighten the effectiveness of this strategy.

The Terran player will be forced to defend or even attack if you use Swarm Hosts. As soon as the Battlecruisers come within range, use the Viper to Abduct a few of them into your forces. You may need to use 2 Abducts in a row to pull the Battlecruiser about 15-18 units to get it in a very vulnerable spot. If the Terran player attacks, you can pull their units right over top of your static defense, forcing them to engage your automated defense. Battlecruisers and Ravens are good, but they are not good enough to beat a full Zerg army that also has 10 Spore Crawlers and 10 Spine Crawlers as support.

At the end of the mayhem, you can quickly remacro Hydralisks and send them in and take out several Terran bases, winning the game. If the Terran stops building air units after you wipe their fleet and goes

back to the ground, morph a handful of your Corruptors into Brood Lords. You can perform this evolution over top of your static defense, which will defend the evolving Corruptors while keeping the Brood Lords close to the front line.

What you cannot do is think is just mass a bunch of Corruptors and attack the SkyTerran army. Odds are you will get blown up by Seeker Missiles and Yamato Cannons and just lose all of your units. Even if you win the engagement through overwhelming Corruptor numbers, you then would be stuck with a big chunk of units that cannot attack ground units. Using some Hydralisks and automated defense protects you against ground units.

Spotting Marines Without Combat Shields or Stim

One common development in Terran play across all ranks in Heart of the Swarm is that Terran players are delaying their research of Combat Shields (and to an extent, Stimpack) in order to divert more resources towards teching up to Factory and Starport sooner. Terran players who move quickly up to Starport tech typically choose to research Barracks upgrades on just one Tech Lab and they typically get Stimpack over Combat Shields.

This presents an interesting window of vulnerability for Zerg players. Marines without Combat Shields are extremely vulnerable to Roaches, with or without stim. If Marines with 45 base HP use stim, this cuts their HP to 35. This allows a +1 weapons Roach to take a Marine down in 2 shots! Given that Roaches have a huge amount of HP as well as a bit of native armor, the Roach completely shreds this low-level Marine in a +1 attack timing attack.

Marines without Combat Shields and Medivac support can even be picked off by Mutalisks with ease. If you are harassing with a healthy 8 Mutalisks and you see the Terran player sending a handful of Marines over to defend, do not automatically assume it is time to get out of there. If the Terran player has not yet researched Combat Shields and has 0/0 Marines, Mutalisks can kill them off with ease and go back to harassing the mineral line and picking off newly produced units.

One way to push this advantage even further is to delay Stimpack and Combat Shields from researching. If you have Mutalisks, you can use the Mutalisks to pick off the Tech Lab that is researching Combat Shields or Stimpack. Stimpack in particular is a fairly lengthy upgrade, so the window of opportunity for spotting the tech lab and killing it is actually quite large.

An alternative solution would be to use drops or even a Nydus Worm to get Roaches inside the main. Even if the Terran player fends this off, if you can get some worker kills and pick off the Tech Lab before you are cleared out, this is a big win for you as a Zerg.

Zerg vs Zerg

Introduction

In the first few years of Starcraft 2, Zerg versus Zerg has become a much more stable match-up in Heart of the Swarm. Unless you are playing on Klontas Mire TE, the maps are large enough that you can go for more economically-oriented builds without risking losing the game to an early Zergling rush.

Now, there are multiple viable combinations in Zerg versus Zerg. In the early game, Zerglings and Banelings are still very popular, but many of the maps have conveniently located choke points that can be blocked off by 2 Evolution Chambers, a Spine Crawler, and a Queen or two, preventing Zergling or Baneling run-bys. Zergling and Baneling attacks can also be thwarted by Roaches, but this requires the Roaching Zerg to deflect the Banelings and Zerglings which typically come earlier than Roaches.

In the mid-game, there are two unit routes that nearly all players work into their army: Mutalisks or Infestors. Mutalisks have the advantage of being very fast, regenerating quickly, stopping Brood Lords and Swarm Hosts, and be relatively strong against most Zerg units. Mutalisks are also great for map control. It is practically impossible for the enemy player to take an expansion if you have an advantage in Mutalisk count. The downside to the Mutalisk is that they can be trapped by Infestors and are weak against Spore Crawlers.

Infestors are a higher skill unit but ultimately slightly stronger than Mutalisks when paired with a ground army. You can win the game outright if you trap a pack of Mutalisks with Fungal Growth and either chain Fungal Growth or use Hydralisks to take out the Mutalisks.

Both are great options, though Mutalisks are a bit more expensive. Your best bet may be to opt for mass Mutalisks/Zerglings if you have an economic advantage and use Hydralisks/Infestors to get back into the game if you are behind.

Short Map Map Strategy

While Klontas Mire TE was removed from the ladder map pool, I am keeping this section in the guide in case another map with a very short rush distance is ever added to the pool. Klontas Mire TE had a very short rush distance across the narrow bridge at the top. Also, since players could only spawn in the top left or right corner of the map, the enemy knew exactly where you were. Since Zerg players cannot wall off their bases early in the game, this made the Zergling rush very effective.

For this reason, you may want to consider opening with a 10 Pool on future maps that are very close by ground and have just 2 spawn locations. This simply means getting up to 10 Drones, building a Spawning Pool, getting an Overlord, going up to 10 Drones, then getting out 6-8 Zerglings as soon as the Spawning Pool finishes. You can then send them in on the offense.

This is not a cheesy build at all. The reason is that a 10 pool is the only way to reliably protect yourself against a 6Pool. If your opponent tries to 6 Pool, your Zerglings will finish right about the time your opponent's Zerglings make their way to your base. You will have the economic advantage as well as a Queen advantage and the opponent's attack will fail, giving you a nice lead heading out of the early game.

If your opponent went for a similar build, this is fine as well. If you microed better than your opponent and killed some of his Zerglings, you can add on a Banelings Nest or more Zerglings and try to end the game.

The only time this build may slightly backfire is if your opponent went for a 13/14 Pool. They will be able to deflect your attack and have a slight economic lead. Fortunately, this is okay. All you have to do is show your Zerglings off in your opponent's base but do not actually attack. Your goal is to make the opponent stop Drone production in order to get out Zerglings. When your opponent cuts Drone production and gets out Zerglings, just make Drones at home. You only need to force them to make 1 round of Zerglings instead of Drones to catch back up in the game, even if you inflict no real damage.

As an added bonus, if your opponent fast expands with a Hatchery first, you practically get a free win. Your Zerglings can force the cancel or destroy their expansion, wasting your opponent's resources. You can then kill off a sizable amount of Drones with your initial Zergling force before their Spawning Pool finishes, ultimately overwhelming them with Zergling reinforcements. Even if you are unable to end the game, you should be able to expand out of this build and be in a big lead going into the mid game.

Using Roaches in the Early Game

Roaches are an excellent tier-1 unit that ultimately trumps both Zerglings and Banelings. If you really struggle with the micro wars that are Zergling/Baneling armies versus other Zergling/Baneling armies, opening with Roaches can be a great way to stop that cold. For a similar resource investment, a Roach army will absolutely shred a Zergling and Baneling army.

The reason that Zerglings and Banelings continue to predominate in the early game is that there are a few downsides to using Roaches. The primary downside is that Roaches are very slow and do not offer map control. They are very vulnerable to run-bys where the enemy Zerg player simply avoids your Roaches and runs into your mineral line to kill off your Drones. In order to prevent this from happening, Zerg players can use Evolution Chambers and a Spine Crawler to create a "wall" at the entrance to their natural expansion. The hole in the wall that your Roaches use to pass should be blocked by a Queen or two on "Hold Position".

However, the walling strategy does not solve the map control problem. If you are essentially turtled in on two bases, a pro-level Zerg will take a fast third (or even fourth) base and transition into Mutalisks with their superior income. Fortunately, unless you are a Master's League (or higher) player, your

opponent's macro just will not be that good where you have to worry about this scenario. If you want to try Roach openers in Zerg vs Zerg and are not already ranked in high Master's league, you do not really have to worry about temporarily losing map control in the early game.

Additionally, you can use automated defense to secure your third base, even if you do not have map control. What you can do is spread the creep out to where your third base should be, build a few Spine and Spore crawlers, then when the creep is where it should be, uproot the crawlers and plant them around where you want to build your third Hatchery. With the area secure, you can finally plant down your Hatchery. This will not be delayed very much considering you can use 2-3 waves of Larva to fully saturate this third base in very little time.

The final weakness of Roaches is that they cannot hit air units. Mutalisks are extremely popular in ZvZ, so you do not want to get surprised by ~8 Mutalisks in the early game when all you have is Roaches. The trick to surviving such an attack is to just send all your Roaches in on the offense. The resources necessary to create 8 Mutalisks is about the equivalent of 16 Roaches (Mutalisks cost more gas, but the Roaches will take more larva, both valuable in their own way in the early-mid game).

If you are surprised by Mutalisks, just send all 16 Roaches on offense. The Zerg player will have no choice but to pull their Mutalisks back in order to try to stop your Roaches. Uncontested, 16 Roaches will rip through a Zerg base much faster than 8 Mutalisks can destroy your base. Even at optimal efficiency, it takes 1 Mutalisk about 17 seconds to kill a single Roach (that is including bounce damage as if it was all dealt to a single target). Given you should have twice the amount of Roaches as Mutalisks, and that uptime will not be 100%, it will take about 40 seconds for the enemy's Mutalisks to take out your Roaches. In those 40 seconds, the Roaches should more than earn their cost in Drone, Queen, Zergling, and tech structure kills. Killing off the Spire is an excellent choice here since Spires are slow to build, are expensive, and required to get Mutalisks. Nothing will force a Mutalisk Zerg to pull back faster than destroying their Spire – and even then the Zerg player will not be able to stop you from killing it!

During this reprieve from the Mutalisks, you will have about 1 minute to get up anti-Mutalisk forces. This could be 1-2 Spore Crawlers in each mineral line. With Queen support, this is typically enough against early game Mutalisks forces. You may want to add another Spore Crawler or two in the late game if the enemy's Mutalisk pack gets very large. Additionally, Mutalisks of your own or Hydralisks are also a good choice.

While the Roach is susceptible to the Mutalisk, it does have the added bonus of sharing upgrades with the Hydralisk. A +1/1 timing attack works very well against Zerglings/Banelings (and even Mutalisks since it takes so long for them to kill Roaches), and then those upgrades transfer right over when you switch into Hydralisk/Roach/Infestor in the late game.

The Roach is also strong against the Mutalisk since you can sacrifice Roaches to deny the enemy Zerg's third base. You can send out a pack of Roaches and just try to rush down the third base once the Hatchery gets built. You can keep denying this. You can extend your staying power significantly with the Burrow and/or Tunneling Claws upgrade. It takes Mutalisks forever to kill Roaches, so you can keep

losing a Roach here or there to continually force the cancellation on the third base while you secure your own third (and get up a few Spore/Spine crawlers).

This does not make the Roach opener necessarily better than Zergling/Baneling/Mutalisks. If you plan to tech into Hydralisk/Infestor, then Roaches may be the better opener due to sharing upgrades. If you plan to ultimately tech into Ultralisks, then a Zergling opener may be better due to sharing upgrades. Alternatively, map choice can influence your pick. Maps that feature narrow chokes where it is hard to surround units will strongly favor Roaches. Large maps with open third bases are more vulnerable to Zerglings. Zergling rush-downs of the third base are devastating on maps with an open third and are hard to stop.

The Importance of the Spine Crawler in the Early Game

You must get 1 Spine Crawler at the entrance to your natural expansion in Zerg vs Zerg match-ups. Preferably, this will be either at an artificial wall you have created out of Evolution Chambers and Queens at the entrance to your natural expansion. On open maps where walls cannot be easily formed, place one Spine Crawler near one or both of the vespene geysers at your natural expansion, then use tech structures or Evolution Pits to prevent back-door access to the mineral line.

Spine Crawlers are incredibly effective versus Zerglings and Banelings for the cost investment, so there is no reason not to get them. Unless you are truly a very high level pro, the small cost investment is more than worth it and will not slow you down in the slightest. In fact, based on the principles of this book, I would argue that even if your Spine Crawlers never kill a single enemy unit, the security you get from placing them frees up mental resources that allow you to more confidently and clearly focus on other aspects of your game. Just getting the structures will pay mental dividends, speeding up macro and micro elsewhere in the game.

Not only do you need to get a Spine Crawler, but you need to know how to use it against Banelings and Zerglings. With proper micro, a handful of your own Zerglings, a Spine Crawler, and a Queen can take out a much larger pack of enemy Zerglings and Banelings. The strategy is to use your Zerglings to just run away from the enemy Zerglings and Banelings, avoiding confrontation with the enemy's units until your Spine Crawler and Queen kill off any Banelings. Once the Banelings are down, you can engage their Zerglings with your own. With a Spine Crawler and a Queen as support, you can defeat a much larger Zergling army. Should the Zerg player try to attack your Spine Crawler or Queen, stop running with your Zerglings and engage their Zerglings with your own. Queens and Spine Crawlers have high HP and take a while for Zerglings to kill, during which point your Zerglings will be doing a large amount of DPS.

Baiting Banelings

In the early game, Zergling/Baneling is a powerful combo. You can easily lose the game if you lose a lot of Zerglings to an enemy Baneling blast. In the early game, with no Centrifugal Hooks (+Baneling movement speed), Zerglings are much faster than Banelings and as a result easily avoided. Each time a Baneling heads towards your units, you need to send 1 Zergling to attack it. Either the Baneling will detonate on your Zergling (a good trade for you) or it will run away. If it runs away, keep attacking it until it explodes or until the enemy Baneling retreats to the safety of its Zerglings. Do not lose your Zergling by getting pulled into the enemy's Zerglings. Instead, retreat back to your main army and repeat this dance. Avoid the enemy's Banelings with your main Zergling ball. Keep repeating this process. The opponent will likely slip up and lose Banelings to detonation. Even if they prevent Banelings from detonating accidentally, eventually they will start to lose Banelings to your Zerglings just because your Zerglings will kill them. If the opponent goes on the offense with the bulk of their Zerglings, try to use your own Banelings to get a big detonation, avoiding single Zerglings and focusing on hitting the main pack. Whoever does this best will win the engagement.

This just requires a lot of practice to get good at. One good way to learn how to do this is to watch a few Zerg vs Zerg pro-level replays to see how they control their Zerglings and Banelings before you play any ladder games.

Of course, there is always the option of "opting out" of these micro battles by using Roaches as discussed in a previous section. With that said, if your micro is better than the average opponent in your league, you may want to embrace these micro battles.

The Strength of the Infestor

Even after the nerfs, Infestors are very good in ZvZ if you are decent at aiming Fungal Growth. Fungal Growth absolutely destroys Hydralisks and Mutalisks if you can land it on them. Hydralisks are weak against Fungal Growth due to simply having low HP. Mutalisks are weak to Fungal Growth not just because of the damage but because it traps them, preventing them from fleeing while you engage with cheaper units like Hydralisks, Queens, or even Infested Terrans.

Fungal Growth also works well on Roaches or Zerglings, but it is not quite as effective. Fungal Growth does a lot of damage to Zerglings, but Zerglings are so fast it is hard to get a good Fungal Growth off (unless you have forced the Zerglings into a choke). Additionally, Zerglings are cheap so taking out a bunch with Fungal Growth is not exactly a huge victory. Roaches have more health than Hydralisks and Zerglings, so Roaches do not suffer very much from a single Fungal Growth. You will need to hit 12+ Roaches with a single Fungal Growth to really get a pay-off. Ideally you can chain Fungal Growths, locking down the Roaches or killing the Zerglings. The main reason though to use Fungal Growth on Roaches is to prevent them from retreating and so that Hydralisks can outrange them. With the range upgrade, Hydralisks have a range of 6 while Roaches have a range of 4. This allows the Hydralisk to

safely get a few extra shots off on a Roach hit by Fungal Growth, wildly shifting the advantage in a fight towards the player who used Fungal Growth.

The primary weakness of the Infestor in ZvZ is not another caster but actually the Ultralisk. Ultralisks are immune to Fungal Growth and Neural Parasite. Ultralisks also take virtually no damage from Infested Terrans due to the Ultralisk's high armor. Infestors simply cannot stop the Ultralisk. Brood Lords are decent against Infestors too, though mass numbers of Infested Terrans can do okay against Brood Lords, at least until you can get some other units out. However, with +2 or +3 Flyer Carapace, even Infested Terrans do not do much against Brood Lords.

Ultralisks in ZvZ – Strategies and Counters

Even with the proliferation of Mutalisks in ZvZ play, 3/3 Ultralisks are one of the best units to get access to in Zerg vs Zerg battles. Ultralisks simply are “the” ground superiority unit of the Zerg army and are not easily stopped once they are fully upgraded. Supply for supply, Ultralisks will destroy every ground unit. Roaches fair okay versus Ultralisks on a cost (but not supply) basis, but Fungal Growth shifts this back into favor of the Ultralisk.

Picking Support Units for the Ultralisk

Ultralisks work well with Infestor support. While Ultralisks are fast enough to catch Hydralisks and Roaches, Ultralisks will have much more uptime on these ranged units if they are rooted with Fungal Growth. Ultralisks have enough HP and damage to burn through Locusts and are fast enough to then attack or chase down the vulnerable Swarm Hosts. Also, if the enemy has a bunch of Mutalisks, when they clump up to focus fire down an Ultralisk, they are very vulnerable to Fungal Growth into more Fungal Growth or Infested Terrans.

The Viper's Blinding Cloud ability also provides great Ultralisk support against Hydralisk/Roach armies. Ultralisks are melee units, so they are not negatively affected by Blinding Cloud in any way. Your Ultralisks will then get in a few free hits while the Zerg player pulls his units out of the cloud. Theoretically you could trap enemy units in the cloud with Fungal Growth resulting in complete domination of the Hydralisk/Roach player, though this would require excellent micro.

Ultralisks cost a lot of vespene gas, so you will have extra minerals leftover. If you have extra supply cap space, use this for Zerglings. A good strategy is to attack or distract the enemy Zerg's main forces with your Ultralisks and Infestors while you secretly send in a pack of Zerglings to important targets on the map like their latest expansion. You can even sneak into the main base if you find the enemy's army be out of position. Even if you lose the Zerglings, as long as you inflicted damage it was a good strategy.

Infestors and Ultralisks cost so much gas that you will be able to throw away a ton of Zerglings in this strategy. If you keep denying expansions or destroying tech, you will win out eventually.

Finally, Queens make an excellent support unit for the Ultralisk thanks to their Transfuse ability. This provides a nice chunk of healing for the Ultralisk, and a Queen with full energy can Transfuse an Ultralisk 4 times (500 total healing). The only thing you have to watch out for is that the Queens do not block the Ultralisks when it comes to actually attacking. Keep the Ultralisks and Queens on two separate control groups so you can control them independently to prevent this from happening.

Countering the Ultralisk

Stopping the Ultralisk is a bit more complicated than using it successfully. The first thing that should come to mind is that you can use Mutalisks or Brood Lords, as the Ultralisk cannot hit air units. However, Mutalisks take forever to kill Ultralisks (especially if the Ultralisks have an armor upgrade advantage over your flyer weapons), and you may find yourself in a “base race” situation where even if you kill off your enemy’s Ultralisks, you lose too many bases and tech structures to stop the next wave of reinforcing units. It can take three +0/0 Mutalisks literally over a full minute to beat a 3/3 Ultralisk with Chitinous Plating. The amount of damage dealt during this time could cost you the game.

Brood Lords do more damage, but they are very slow and cannot hit air units. A good Zerg player will simply split their units or otherwise avoid your Brood Lords. Ultralisks and Zerglings are much faster than Brood Lords, so the Ultralisk-using Zerg can just avoid them. By avoiding the Brood Lords initially, the Ultralisk-using Zerg has enough time to mix in a couple Corruptors to protect their Ultralisks versus even a large number of Brood Lords.

If you have extra minerals and do not want to transition out of air, air builds can still work against mass Ultralisks. You just need a sizable number of Spine Crawlers (about 1 for every 2 Ultralisks) at each expansion. This is a large mineral investment but you should have a lot of leftover minerals if you are going for air units. If the enemy tries to ignore the Spine Crawlers, they will provide a nice DPS boost against the Ultralisks. If the enemy tries to destroy the Spine Crawlers, this will give you a lot of extra time to use your Mutalisks to burn down the Ultralisks. Even if they kill a bunch of Spine Crawlers, any time you can trade a mineral-only unit or structure (i.e. the Spine Crawler) for a very gas-expensive unit (the Ultralisk), you are in a winning situation.

The next obvious answer would be to make Ultralisks of your own. This can work, but requires an economic advantage to be reliable. If you have a similarly-sized economy to your opponent, you are relying on a better engagement or engagement angle to win the game. Spine Crawlers to support your Ultralisks helps, since Spine Crawlers do not cost gas. It can be hard to gain map control though if you go for this option. I would prefer to only use this option.

One solution that may not be very apparent but actually is perhaps the most effective strategy is the use of the Viper in conjunction with mass Hydralisks, Roaches, and possibly Swarm Hosts or static defense. Despite their various immunities, Ultralisks are not immune to the Viper's Abduct ability. By Abducting Ultralisks to the back of your army one at a time, you put them in a position where all your Roaches and Hydralisks can hit them at the same time, literally melting an Ultralisk instantly each time.

This abduction strategy works best in the late game when you have some static defense to fall back to. You can push out with your Roach/Hydra army, use Abduct to grab an Ultralisk, and you will either kill it or the enemy will try to attack you with their full army. If they try to attack you, quickly pull your army back to the confines of your static defenses. If they keep pushing, you get to engage the enemy with help from your static defense. If they do not keep pushing, use your Vipers to grab a few Ultralisks to destroy. Make sure you do not over produce Vipers. No more than 3 in order to execute this strategy successfully.

Keep repeating this abduction process. Sometimes, you will get 4-5 Ultralisks in a short window at which point you should have enough of a supply advantage to where you can engage their army directly. Alternatively, if you just keep getting 1-3 Ultralisks per engagement, keep it up. You will eventually bleed their resources dry. Each Ultralisk is a 300 mineral/200 vespene investment, so each time you snipe one, you will get further and further ahead in the game.

General Strategies

Below, you will find a list of general strategies that all races can use to their advantage that have not yet been covered or deserve to be repeated.

The Move Drop

One of the most important skills in this general strategies section is learning how to perform a moving drop. This is the technique that allows your Medivacs, Overlords, and Warp Prisms to drop units as they are moving. Dropping your units while moving is ideal for dropping units into enemy mineral lines, as you can drop your units over the entire mineral line without having to stop moving.

It helps that this trick is easy to perform. All you have to do is select “Unload All” (“D” by default), then click on the actual transport itself rather than on the ground. If you select Unload All then click on your ship, it will start unloading its units as it is moving. Hit “S” for “Stop” if you want to cancel this command. If you have multiple ships and want them all to move drop, you need to repeat this process for each transport.

For Terran players, picking up units like Hellbats and then flying them over fleeing workers is a great way to use this skill. For Zerg players, picking up Banelings and flying them over top of a bio-based Terran army is an excellent tactic. Protoss players can use this same strategy to spread out the delivery of Zealots into a mineral line, making it harder for the enemy’s workers to flee.

Zooming in to Scout Observers

Observers can hide in your base for a long period of time, and without detection, they are very hard to spot. An Observer slightly blurs the ground it hovers over, but good players will try to hide their Observers over map textures that do not readily show blur (i.e. dark spots and shadows).

One way you can quickly confirm whether or not an Observer is present at a particular location by zooming in the camera over the suspected blur. You can do this by pressing the “Page Down” key or using the scroll wheel (if you have a wheel mouse). When you are in this zoomed in position, the blur is so much easier to see. You can zoom back out by pressing “Page Up” or using the mouse wheel.

This is a fast way to confirm whether or not an Observer is at a specific spot before wasting a Scanner Sweep or taking the time to make or move a detector and your army over to this location.

Protoss Builds Guide

Below, you will find 3 Protoss builds that you can copy and practice in accordance with the training section mentioned earlier in this book. For best results, print these out (click “Print” and then select the specific pages the charts appear on for the build you want to practice). If you do not have a printer, copy the builds to a sheet of paper with a pen.

Protoss vs Protoss Build

The Protoss vs Protoss build covered on the next page is a very aggressive opener that can be used to control the pace of many Protoss versus Protoss games. The idea is that with early aggression and an early Mothership Core, you can easily defend 4-Gates, prevent Dark Templar rushes, and get an easy win against early expansion builds. Meanwhile, we will work towards secretly getting an Oracle out while continuing to apply pressure at the front door of the opponent’s base. While the Protoss player will be working hard to stop your initial attack, the Oracle will come in from the side to destroy any Probes, Zealots, and Sentries, allowing your primary forces to safely get up the ramp.

Even if your attack does not end the game, you can safely expand out of your pressure and use your Mothership Core to help defend against much larger enemy forces. Extreme care must be taken not to lose your Mothership Core or waste its energy. You need the Mothership Core to provide vision of the high ground and to take out (or at least chase away) any Sentries your opponent may have out. If the opponent eventually defends your attack, you need a Mothership Core with a lot of energy in order to easily defend your natural expansion.

Step	Time	Unit/Structure	Supply	NotesPvP Build
1	0:00	Probe	7/10	Probe/build may be delayed by 1 sec due to starting lag
2	0:17	Probe	8/10	
3	0:35	Probe	9/10	
4	0:50	Pylon	9/10	Place near Nexus. Use a "Sim City" base layout.
5	0:57	Probe	10/10	
6	1:15	Probe	11/18	Chrono Boost the Nexus
7	1:27	Probe	12/18	
8	1:39	Probe	13/18	Chrono Boost the Nexus
9	1:41	Gateway	13/18	
10	1:51	Probe	14/18	
11	2:03	Probe	15/18	Rally Probe #14 to Assimilator
12	2:05	Assimilator	15/18	
13	2:13	Assimilator	15/18	Probes return to mineral harvesting after warping
14	2:20	Probe	16/18	Chrono Boost the Nexus
15	2:33	Probe	17/18	Probe #16 to harvest gas, plus 3 other total Probes.
16	2:34	Pylon	17/18	There will be 2 Probes on each gas for 4 total.
17	2:44	Probe	18/18	
18	2:55	Cybernetics Core	18/18	
19	3:01	Probe	19/26	
20	3:08	Probe	20/26	
21	3:21	Gateway	20/26	
22	3:35	Probe	21/26	
23	3:45	Warp Gate Tech	21/26	
24	3:45	Stalker	23/26	
25	3:52	Probe	24/26	Move an additional Probe to harvest gas (5 Probes total)
26	3:58	Pylon	24/26	Chrono Boost the Cybernetics Core
27	4:08	Mothership Core	26/26	
28	4:18	n/a	26/26	Chrono Boost the Cybernetics Core
29	4:27	Stalker	28/34	
30	4:29	Stalker	30/34	
31	4:38	Probe	31/34	Chrono Boost the Cybernetics Core
32	4:40	n/a	31/34	Send the Probe out with the Mothership Core to get
33	4:55	Probe	32/34	Into position to make a proxy Pylon.
34	4:59	Stargate	32/34	
35	5:13	Probe	33/34	Chrono Boost the Cybernetics Core
36	5:23	Pylon	33/34	Place Pylon in a forward position.
37	5:34	Pylon	33/34	Poke enemy with Stalkers while your Pylons go up.
38	5:52	n/a	33/34	Convert Gateways into Warp Gates
39	6:04	Oracle	36/50	Continue to harass enemy with Stalkers and M. Core
40	6:13	Stalker x2	40/50	Warp Stalkers to Proxy Pylon
41	6:32	Probe	41/50	
42	6:49	Nexus	41/50	Send Oracle in to attack. If there are no Stalkers, use
				the Oracle to attack the Zealots and Sentries. This will
				allow you to push up into the Protoss base freely.

Protoss vs Terran Build

Terran players have the capacity to be particularly annoying in Heart of the Swarm due to the Widow Mine. The Widow Mine is so obnoxious because you need detection in order to stop them. Additionally, the Widow Mine is able to be produced very early in the game, much earlier than any other race can get out cloaked units.

I have found the best way to maintain control of the game as a Protoss player without having to alter your build based on whether or not your Terran opponent gets out Widow Mines is to go for a very aggressive opener. The build recommended below is by far the most aggressive build in this guide, but it is highly effective and can easily transition into the mid-game if you fail to win outright.

Try to inflict as much damage as possible with the initial timing attack. Once the Terran chases you away with enough units or Widow Mines, fall back and expand. You should be able to get out some detection before the Terran player can sneak some Widow Mines into your base. Do not worry about a proxy Factory; if the Terran player does not focus all their production on defending their main base from your attack, they will assuredly lose against this build.

The build ends with setting you up to fall back into macro mode should your initial attack fail to win the game. As long as you deal some damage and slow down the Terran tech and thin out the worker count, you will be in a great position heading into the mid-game.

Step	Time	Unit/Structure	Supply	Notes	PvT Build
1	0:01	Probe	7/10		
2	0:18	Probe	8/10		
3	0:35	Probe	9/10	Rally 9 th Probe entrance of main to build Pylon at 0:56	
4	0:52	Probe	10/10	Supply block intentional	
5	0:56	Pylon	10/10	Near entrance to main. Send Probe back to mine.	
6	1:22	Gateway	10/10		
7	1:34	Assimilator	10/18		
8	1:41	Probe	11/18	Chrono Boost Nexus	
9	1:52	Probe	12/18		
10	2:06	Probe	13/18		
11	2:10	n/a	13/18	Chrono Boost Nexus	
12	2:19	Probe	14/18		
13	2:30	Cybernetics Core	14/18		
14	2:32	Probe	15/18		
15	2:46	Zealot	17/18	Probes cut briefly	
16	3:00	Pylon	17/18		
17	3:05	Probe	18/18		
18	3:25	Mothership Core	20/26	Chrono Boost Nexus	
19	3:32	Stalker	22/26	Chrono Boost Gateway, rally the Zealot to the Terran	
20	3:50	Probe	23/26	Chrono Gateway, move Mothership Core to the Terran	
21	4:01	Stalker	25/26	Rally Stalker to the Terran	
22	4:03	Pylon	25/26		
23	4:08	Probe	26/26		
24	4:30	n/a	26/34		
25	4:32	Probe	27/34		
26	4:34	Warp Gate Tech	27/34	Attack the Terran with Stalker + Zealot + M. Core	
27	4:49	Probe	28/34		
28	5:08	Probe	29/34	Second Stalker arrives. If your enemy pulls SCVs,	
29	5:10	Nexus	29/34	kite enemy SCVs with your Stalkers – do not let them	
30	5:27	Probe	30/34	get off free hits.	
31	5:29	Stalker	32/34	Chrono Boost Gateway	
32	5:42	Assimilator	32/34		

Protoss vs Zerg Build

The Protoss vs Zerg build in this guide is much longer than the other two Protoss builds, but also will result in a win in practically every game in any league lower than Diamond. This is a Heart of the Swarm variation of the ever popular and effective “Immortal Sentry All In”, using the Mothership Core and +1 Weapons as part of the timing attack.

If your timings are perfect, there is no way a lower-ranked Zerg opponent is going to be able to hold off this timing attack. However, once you begin to climb the ranks, you may not win all of your games outright with this attack. Even if you do not end the game here, you can still inflict significant damage before falling back and working on getting out higher tier units.

The goal here is to get out several Immortals and a large number of Sentries and go in for a major timing attack with +1 weapons. While you are attacking, you can warp in wave after wave of Zealots to reinforce your attack. You want to get the Zealots last because getting the Sentries out early gives the Sentries time to build up a lot of energy. Your strategy is to use Force Fields to prevent Zerglings from surrounding your units and to cut off reinforcements from one Zerg base to the next. You can put the bulk of your army at the third base for example then cut off reinforcements from the main and natural with Force Fields while you destroy the Zerg’s third plus all the Drones that are mining there.

Step	Time	Units/Structure	Supply	Notes	PvZ Build
1	0:00	Probe	7/10		
2	0:17	Probe	8/10		
3	0:34	Probe	9/10		
4	0:45	Pylon	9/10	Brief Probe lapse	
5	0:54	Probe	10/10		
6	1:11	Probe	11/18	Chrono Boost Nexus	
7	1:22	Probe	12/18		
8	1:35	Probe	13/18	Chrono Boost Nexus	
9	1:46	Probe	14/18	Send Probe that spawns to natural expansion	
10	1:59	Probe	15/18		
11	2:18	Nexus	15/18	Brief Probe production cut	
12	2:24	Probe	16/18		
13	2:38	Forge	16/18	Brief Probe production cut	
14	2:44	Probe	17/18		
15	2:54	Pylon	17/18	Place near ramp to natural	
16	3:01	Probe	18/18		
17	3:20	Gateway	18/26	May need to reverse timings of Forge and Gateway.	
18	3:27	Photon Cannon	18/26	Place cannon behind Gateway/Pylon.	
19	3:30	Probe	19/26	Chrono Boost Main Nexus	
20	3:37	Assimilator	19/26		
21	3:41	Probe	20/26		
22	3:47	Assimilator	20/26		
23	3:53	Probe	21/26	Chrono Boost Main Nexus	
24	3:58	Probe	22/36	Chrono Boost 2nd Nexus	
25	4:05	Probe	23/36	Train Probe at main Nexus	
26	4:07	n/a	23/36	Move Probes to Assimilator 1 (3/3)	
27	4:10	Probe	24/36	Train Probe at natural Nexus	
28	4:18	n/a	24/36	Move Probes to Assimilator 2 (3/3)	
29	4:19	Probe	25/36	Train Probe at main Nexus	
30	4:31	Cybnertics Core	25/36		
31	4:33	Probe x2	27/36		
32	4:51	Probe x2	29/36	Chrono Boost both Nexuses	
33	4:54	Pylon	29/36		
34	5:01	Probe x2	31/36		
35	5:15	Probe x2	33/36		
36	5:23	Sentry	35/44		
37	5:23	Warp Gate Tech	35/44		
38	5:30	Probe x2	37/44	Chrono Boost both Nexuses	
39	5:37	Robotics Facility	37/44		
40	5:41	Probe x2	39/44		
41	5:50	Assimilator	39/44		
42	5:55	Probe x2	41/44		
43	6:02	Sentry	43/44		
44	6:08	Pylon	42/44	Lost 1 supply due to losing scouting Probe	

Step	Time	Units/Structure	Supply	Notes	PvZ Build
45	6:12	Probe x2	44/44		
46	6:20	Assimilator	44/44	Send 3 Probes to Assimilator built in Step #41	
47	6:33	Probe x2	46/52		
48	6:36	Pylon	46/52		
49	6:41	Immortal	49/52	Lost 1 supply due to losing a second scouting Probe	
50	6:45	Sentry	51/52		
51	6:50	Probe	52/52	Chrono Boost Robotics Facility	
52	6:53	Pylon	52/52	Very brief supply block.	
53	7:01	Probe	53/60		
54	7:01	Mothership Core	55/60		
55	7:12	Pylon	55/60		
56	7:18	Probe	56/68	Probe production cut.	
57	7:27	Immortal	60/68		
58	7:35	Gateway x3	60/76		
59	7:40	+1 Weapons	60/76		
60	7:47	Pylon	60/76		
61	8:05	Gateway x4	60/76		
62	8:05	Observer	61/76	Chrono Boost Robotics Facility	
63	8:25	Immortal	65/84	Chrono Boost Robotics Facility	
64	8:25	Sentry	67/84		
65	8:30	Pylon	67/84		
66	8:42	Pylon	67/84		
67	8:53	Sentry x3	63/92	Chrono Boost Robotics Facility	
68	8:57	Pylon	73/92		
69	8:58	Sentry	75/92		
70	8:59	Pylon	75/92		
71	9:09	Immortal	79/100	Chrono Boost Robotics Facility	
72	9:10	n/a	79/100	Move out and attack your opponent.	
73	n/a	Zealots x8	n/a	Warp rounds of 8 Zealots on your 8 Gateways in as a reinforcement throughout your attack. Bank gas for a transition into higher tech should you not win the game with this timing.	

Terran Builds Guide

Of all the races, Terran players are most easily able to stick to exact build timings in the charts below no matter what the opponent does to try and stop you. Terrans have the ability to control the flow of the early and mid-game better than any other race due to the defense provided by Bunkers, Widow Mines, and Siege Tanks along with the map control provided by the Reaper, Hellion, and Widow Mine. This allows the Terran to plan for a 10:00 timing attack and hit that timer without much interference from the opponent.

Terran vs Protoss Build

Without High Templar with Psionic Storm and energy or Colossi with Extended Thermal Lances, Protoss players are very susceptible to the classic Marine, Marauder, and Medivac combo. The timing attack below focuses on getting out a powerful MMM attack just before the Protoss player is going to be able to get out enough Colossus or High Templar with Psionic Storm to make a difference. Even if there is a Colossus or two out on the field, these will not have Extended Thermal Lances yet, so you can snipe them with your Marauders.

Note that there is a brief window of vulnerability to proxy Oracle attacks. You need to be mindful of any Oracles that fly in before your Missile Turrets go up and be quick to pull your Marines to stop this harass. If you are fast, you will barely take any damage from such an attack. If you are slow, you can easily lose many workers and ultimately the game. With practice, stopping Oracles will become much easier.

When you reach the end of the build, move in to attack with all of your units. How you engage the opponent depends on what the opponent has as part of their army. You may want to drop some units into the main while you attack the front. You may want to avoid ramps altogether by using your Medivacs to transport units around. Dropping your full army into the Protoss main base can work too.

While you are attacking, queue up as many Medivacs, Marines, and Marauders as you can possibly build and rally them to your troops on the front line. You can cut SCV production at the end of the build, using your resources entirely to build new units. Save some Orbital Command energy for Scanner Sweep energy in case the opponent warps in Dark Templar.

You need to inflict as much damage as possible with this attack, but you do not have to win the game. If the Protoss is on 3 bases, you need to kill at least 1 base though in order to come out ahead. If you have to fall back from here, grab a third base and start working in either Vikings (if there is Colossi) or Ghosts (if there are Archons/High Templar). Also make sure you build a second Engineering Bay so you can catch up on +Infantry Armor and Weapons upgrades, since only +1 Weapons is worked into this build. If there are neither you should have no problem winning the game outright.

Step	Time	Unit/Structure	Supply	Notes	TvP Build
1	0:01	SCV	7/11		
2	0:18	SCV	8/11		
3	0:35	SCV	9/11		
4	0:52	SCV	10/11	Rally produced SCV to entrance to make S. Depot	
5	0:58	Supply Depot	10/11		
6	1:09	SCV	11/11		
7	1:28	SCV	12/19	~2 second intentional supply block.	
8	1:45	SCV	13/19		
9	2:02	SCV	14/19		
10	2:16	Command Center	14/19		
11	2:21	SCV	15/19	Send this SCV to scout.	
12	2:38	SCV	16/19		
13	2:45	Barracks	16/19		
14	2:55	SCV	17/19		
15	3:07	Barracks	17/19		
16	3:14	SCV	18/19		
17	3:31	SCV	19/19		
18	3:58	Orbital Command x2	19/30		
19	3:58	Marine	20/30		
20	4:14	Barracks	20/30		
21	4:15	Marine	21/30		
22	4:21	Marine	22/30		
23	4:26	Refinery x2	22/30	Supply lost due to scouting SCV dying	
24	4:28	SCV	22/30	Drop MULEs	
25	4:40	SCV	23/30		
26	4:40	Marine	24/30	You may need to delay SCV production a second	
27	4:46	Marine	25/30	or two in order to get these Marines out. Marines	
28	4:47	SCV	26/30	have preference here to protect you from Oracles.	
29	4:53	Supply Depot	26/30		
30	4:56	SCV	27/30	Move SCVs to newly completed Refineries	
31	5:06	SCV	28/30		
32	5:11	Marine	29/30		
33	5:12	Tech Lab	29/30		
34	5:13	SCV	30/30		
35	5:20	Bunker	30/30	Built at entrance to natural expansion – protects	
36	5:23	SCV	31/38	against 4-gates and 2-Gate + Mothership Core	
37	5:28	Marine	32/38		
38	5:30	SCV	33/38		
39	5:38	Marine x2	35/38		
40	5:40	SCV	36/38		
41	5:40	Stimpack Research	36/38		
42	5:45	Supply Depot	36/38		
43	5:48	SCV	38/38		
44	5:57	SCV	38/38	Drop MULEs	

Steps	Time	Units/Structure	Supply	Notes	TvP Build
45	5:59	Supply Depot	38/38		
46	6:08	Engineering Bay	38/38		
47	6:15	Marine x3	41/46		
48	6:15	SCV	42/46		
49	6:17	SCV	43/46		
50	6:25	Factory	43/46		
51	6:32	SCV	44/54		
52	6:32	Refinery	44/54		
53	6:35	SCV	45/54		
54	6:41	Reactor x2	45/54		
55	6:49	SCV	46/54		
56	6:50	Missile Turret	46/54	Build in main base mineral line	
57	6:52	SCV	47/54		
58	6:54	Marauder	49/54		
59	7:00	Supply Depot	49/54	Move SCVs to gas at newly completed Refinery	
60	7:06	Supply Depot	49/54		
61	7:06	SCV	50/54		
62	7:09	SCV	51/54		
63	7:14	Missile Turret	51/54	Place in natural expansion mineral line	
64	7:23	SCV	52/54		
65	7:25	Marauder	54/54	Drop MULEs	
66	7:28	Starport	54/54		
67	7:29	SCV	55/62		
68	7:31	Reactor	55/62	Add on to Factory	
69	7:39	Marine x4	59/70		
70	7:41	SCV	60/70		
71	7:46	+1 Infantry Weap	60/70		
72	7:50	Supply Depot	60/70		
73	7:54	SCV	61/70		
74	7:57	Marauder	63/70		
75	7:59	SCV	64/70		
76	8:03	Marine x2	66/70		
77	8:06	Marine x2	68/70		
78	8:12	Supply Depot	68/70	Swap Factory and Starport to change add ons.	
79	8:14	SCV	69/70	Lift off Factory and float towards Protoss main.	
80	8:27	Marine x2	71/78		
81	8:30	Combat Shields	71/78		
82	8:32	SCV x2	73/78		
83	8:36	Medivac x2	77/78		
84	8:42	Marine x2	79/86		
85	8:44	Marauder	71/86		
86	8:47	Supply Depot	81/94		
87	8:52	SCV	82/94		
88	8:52	Marine x2	84/94	Drop MULEs.	

Step	Time	Units/Structure	Supply	Notes	TvP Build
89	8:58	SCV	85/94		
90	8:58	Supply Depot	85/94		
91	9:06	Marine x2	87/94		
92	9:11	Supply Depot	87/94		
93	9:14	SCV	88/94		
94	9:14	Marauder	90/94		
95	9:18	Marine x2	92/102		
96	9:22	Medivac x2	96/102		
97	9:23	SCV	97/102		
98	9:31	SCV	98/110		
99	9:31	Supply Depot	98/110		
100	9:33	Marine x2	100/ 110		
101	9:35	n/a	100/ 110	Attack the opponent.	

Terran vs Terran Build

Terran vs Terran requires the most aggression out of all the Terran match-ups due to the prevalence of early drops and/or Banshees. The build we will be working on is a single-base timing that involves getting out an extremely fast set of 2 Medivacs and 4 Hellbats and then dropping them in the opponent's base. This build then involves constantly producing more Hellbats and Medivacs and continuing with the drop.

The beauty of this build is that it is more than just a Hellbat drop. Not only can you kill a lot of workers with this build just like with any Hellbat drop, but this timing hits so early that your 4 Hellbats and 2 Medivacs will actually be very difficult for your opponent to stop even when confronted directly.

The effectiveness of this build has barely been altered by the slight nerf to Hellbats that causes them to not deal bonus damage to light units before getting Infernal Preigniter. The reason for this is that the whole purpose of this opener is not to try to rush down SCVs but rather actually outright kill your opponent's army. The drop hits early enough in the game that there will not be any more than 1 Siege Tank on the map. Hellbats with Medivac support can easily take down unupgraded Marines, Marauders, and Hellions. Widow Mines can be avoided and detected with Scanner Sweep.

This build also involves constantly reinforcing your drop with more dual-pronged drops. Your first drop should hit together, keeping your 4 Hellbats and 2 Medivacs as one army. As mentioned earlier, this will be difficult for the opponent to stop. Try to keep these units alive as long as possible, focusing on the enemy's army rather than killing workers. While your initial units are jousting in the main and killing whatever they can, your second set of Medivacs can drop in the opponent's natural expansion (should one exist). If there is no natural expansion, drop your units in the main to reinforce your initial attack. Even if your first set of drops gets cleaned up by your opponent, you will begin to wear your opponent's army and forces down, especially if you kill off some SCVs and reduce their ability to train reinforcements.

There are only 3 things that are strong against this build: Banshees, Missile Turrets, and Bunkers. If a Banshee comes out, start training a pair of Vikings instead of a new pair of Medivacs. Keep your Hellbats out as long as possible to inflict damage, but then scoop up weak Hellbats in your Medivac. Use your Medivac to fly around and drop your Hellbat(s) on the enemy's workers. Banshees cannot hit air units so there is no way for your opponent to attack the Medivacs. Your Hellbats should have been able to kill any Marines on the ground. If your opponent has Vikings and Banshees then your timing was much slower than the build listed on the next page.

You need to keep your Medivacs out of range of any Missile Turrets. Use your Hellbats to kill Missile Turrets (they can kill turrets surprisingly fast) as something of a priority (use your judgment) so that your Medivacs have more freedom to move around. Bunkers are also not a good target to attack, but they also cannot move. Just ignore them and use your Hellbats to attack units and structures not in range of the Bunker. Once you have destroyed your opponent's base and economy, you can then kill off any remaining Bunkers.

The end of the build works in a transition into a Command Center and further upgrades. From here, you are positioned to tech into a more appropriate Viking/Siege Tank/Hellbat (plus support units) army. If you are about to win you can keep producing Hellbats and Medivacs to lock up your victory.

Step	Time	Unit/Structure	Supply	Notes	TvT Build
1	0:01	SCV	7/11		
2	0:18	SCV	8/11		
3	0:35	SCV	9/11		
4	0:52	SCV	10/11	Send newly created SCV to make Supply Depot	
5	0:58	Supply Depot	10/11	Place Depot at entrance to base (while this does make	
6	1:09	SCV	11/11	one more vulnerable to Banshees and tanks, it helps	
7	1:28	Refinery	11/11	deny scouting info, which is more important here.	
8	1:28	SCV	12/19	Brief supply block for 1-2 seconds.	
9	1:45	SCV	13/19		
10	1:53	Barracks	13/19		
11	2:00	n/a	13/19	Move 2 SCVs to gas so Refinery is 3/3 on harvesters.	
12	2:02	SCV	14/19	Send SCV out to scout. Look for proxies.	
13	2:19	SCV	15/19		
14	2:35	SCV	16/19		
15	2:58	Orbital Command	16/19	SCVs delayed for 2-3 seconds.	
16	3:03	Factory	16/19	Same SCV as Barracks. Try to hide in Factory in main.	
17	3:06	Marine	17/19	Kill enemy scout with this unit.	
18	3:23	Refinery	16/19	Supply count drops by 1 as scouting SCV is killed.	
19	3:35	SCV	17/19	Drop MULE. Send SCV to entrance for Supply Depot.	
20	3:39	Supply Depot	17/19	Use to wall off main entrance. Denies scouting.	
21	3:52	SCV	18/19		
22	3:53	n/a	18/19	Refinery #2 finishes, move SCVs to gas.	
23	4:09	Starport	18/19	Use same SCV that made Factory.	
24	4:12	SCV	19/27	SCV production may be cut for a few seconds	
25	4:24	Armory	19/27	Hide this. Do not let your opponent see your Factory,	
26	4:29	SCV	20/27	Starport, and Armory all in 1 Scanner Sweep.	
27	4:38	Supply Depot	20/27	Completes the wall at entrance to your main base.	
28	4:46	SCV	21/27	Lift off Factory and fly it towards opponent's base.	
29	4:49	Reactor	21/27	Add on to the Factory	
30	5:03	SCV	22/27	Drop MULE	
31	5:03	Reactor	22/27	Add on to the Starport	
32	5:20	SCV	23/35	Send SCV to scout	
33	5:35	+1 Vehicle Weap.	23/35		
34	5:37	SCV	24/35		
35	5:40	Hellbat x2	28/35		
36	5:45	Supply Depot	27/35	Lose scouting SCV	
37	5:58	Medivac x2	31/35		
38	6:10	Hellbat x2	35/35		
39	6:19	Supply Depot	35/43		
40	6:40	Hellbat x2	39/43	Load 4 Hellbats into 2 Medivacs & move out to attack.	
41	6:44	Medivac	41/51	Drop MULE	
42	6:50	Medivac	43/51		
43	6:53	SCV	44/51		
44	7:04	Supply Depot	44/51		

Step	Time	Unit/Structure	Supply	Notes	TvT Build
45	7:17	Hellbat x2	48/51		
46	7:20	SCV			
47	7:20-7:50	N/A	49/51	Your first drop will arrive around here. Control it well over the next 30 seconds. Supply counts will no longer be accurate, as the number of Hellbats and Medivacs your opponent kills will vary from game to game.	
48	7:50	n/a	n/a	Load up second set of drops and send towards opponent's base.	
49	7:52	Medivac x2	n/a		
50	7:52	Hellbat x2	n/a		
51	7:57	SCV	n/a	Drop MULE.	
52	8:20	Command Center	n/a		
53	8:27	Hellbat x2	n/a		
54	8:45	Vehicle Weap. +2	n/a		
55	8:45	SCV	n/a		
56	9:00	n/a	n/a	Reinforce attack with all remaining units and try to end the game.	
57	n/a	n/a	n/a	Your opponent's economy should be crippled even if they hold off the attack. Use your advantage to expand and fully saturate your natural expansion. Tech into mass Siege Tanks/Vikings/Banshees/Hellbats and win with a follow-up attack in a few minutes.	

Terran vs Zerg Build

The Terran vs Zerg build recommended below is definitely the longest and most involved of the Terran builds. The idea is to start out with a Hellbat drop to inflict enough damage to delay the Zerg's economy and tech. This delay will leave the Zerg susceptible to a follow up attack with Hellbats and Thors. As a result, it is a two-part timing attack, where the opening harass creates the window of vulnerability that allows the second attack to be so effective.

Zerg players are very susceptible to this timing attack because in the Zerg player needs Tier 3 (Brood Lords, Vipers, Ultralisks/Infestors, etc.) in order to stop Hellbat/Thor. The initial Hellbat drops are designed to prevent the Zerg from getting access to these high tier units by the time your second assault of Hellbats and Thors arrives.

You may be thinking, "Why perform the Hellbat drop at all? Why not tech straight to Thors and Hellbats and then attack in a single timing?". The reason for this is that the limiting resource here for the Terran player is vespene gas whereas limiting resource for the Zerg player is **time**. Thors, Factories, and upgrades cost a lot of gas, so the Terran player needs to bank up vespene gas to fund this attack. The Zerg player needs to get out a Hive plus Greater Spire then morph Brood Lords from Corruptors. Alternatively, the Zerg player would need Vipers. All of these options require a lot of time. As a result, this timing is much more effective if the Terran player can delay the Zerg player's tech without spending too much gas. This can be done most easily with Hellbats.

The timing of the drop itself is somewhat late. It is not necessary for the drop to inflict major damage, although many times it will. Even if you just trade with the Zerg player, you are trading minerals (which you will have extra of anyway) while increasing the amount of time it takes for the Zerg player to get out tier 3 units. All the while, you are banking gas which you can roll into a round of Thors.

Note that your supply counts and build in the late game may change slightly from game to game depending on how many Hellbats you lost during your drops. This build assumes you lose most of your units with each drop. If your units stay alive, you will be doing massive amounts of damage and likely win the game outright, so it is best to plan on losing the units as part of the build.

Step	Time	Unit/Structure	Supply	Notes	TvZ Build
1	0:01	SCV	7/11		
2	0:18	SCV	8/11		
3	0:35	SCV	9/11		
4	0:52	SCV	10/11	Rally 9 th SCV to build Supply Depot at entrance	
5	0:58	Supply Depot	10/11		
6	1:09	SCV	11/11		
7	1:28	SCV	12/19	SCV delayed for a bit while S. Depot finishes	
8	1:33	Barracks	12/19	Same SCV that made S. Depot	
9	1:45	SCV	13/19		
10	2:02	SCV	14/19		
11	2:19	SCV	15/19		
12	2:39	Orbital Command	15/19		
13	2:40	Marine	16/19	Send SCV out to build Command Center.	
14	3:05	Command Center	16/19	Safer to build CC in base, faster to build at expac -	
15	3:15	SCV	17/19	use your judgement on placement. This build	
16	3:19	Supply Depot	17/19	assumes you are building at natural.	
17	3:23	Marine	18/19	Drop MULE	
18	3:32	SCV	19/19		
19	3:42	Refinery x2	19/19		
20	3:49	SCV	20/27		
21	3:52	Marine	21/27	Send a Marine out to scout	
22	4:05	SCV	22/27		
23	4:16	Marine	23/27		
24	4:22	SCV	24/27		
25	4:39	SCV	25/27		
26	4:44	Factory	24/27	Supply drops by 1 as scouting Marine is killed	
27	4:45	Orbital Command	24/38		
28	4:50	Bunker	24/38	Build at entrance to natural expansion	
29	4:57	SCV	25/38		
30	4:57	Reactor	25/38	Add on for your Barracks	
31	5:13	SCV	26/39		
32	5:21	SCV	27/38	Drop MULE	
33	5:30	SCV	28/38		
34	5:38	Supply Depot x2	28/38	Build near Bunker to create building wall	
35	5:40	SCV	29/38		
36	5:47	SCV	30/38		
37	5:51	Armory	30/38		
38	5:57	Starport	30/38		
39	5:57	SCV	31/38		
40	6:01	Hellion x2	35/38		
41	6:08	SCV	36/54		
42	6:14	SCV	37/54	Drop MULE	
43	6:25	SCV	38/54		
44	6:31	SCV	39/54		

Step	Time	Unit/Structure	Supply	Notes	TvZ Build
45	6:42	SCV	40/54		
46	6:47	Medivac	42/54	Drop MULE.	
47	6:48	SCV	42/54	Supply count drops by 1 due to losing scout.	
48	6:54	Supply Depot	42/54	Build as part of natural ramp wall	
49	6:58	Hellbat x2	46/54	Use initial 2 Hellions for map control	
50	6:58	SCV	47/54		
51	6:59	+1 Vehicle Weap.	47/54		
52	7:04	SCV	48/54		
53	7:16	SCV	49/54		
54	7:21	SCV	50/54		
55	7:28	Hellbat x2	54/62	Move out with Medivac filled with 2x Hellbat	
56	7:29	Medivac	56/62		
57	7:34	SCV	57/62		
58	7:38	SCV	58/62	Drop MULE	
59	7:44	Supply Depot	58/62	Build inside main base, lift off and move to 3 rd later	
60	7:51	SCV	59/62		
61	7:55	SCV	60/62		
62	7:56	Command Center	60/62		
63	8:00	Hellbat	62/62	Brief supply block – OK because you need to control	
64	8:01	Factory	62/62	the drop during this time.	
65	8:04	Supply Depot	62/62	If the Zerg has a 3 rd base, attack Drones with your	
66	8:15	SCV x2	64/70	2 Hellions at the third while your Hellbats drop in	
67	8:15	Medivac	66/70	the Zerg's main.	
68	8:15	Hellbat	68/70		
69	8:30	Hellbat	68/70	Lost 1x Hellbat, -2 supplies	
70	8:31	n/a	62/70	Drop #2 arrives. Control this. Lost 4 supply of units..	
71	8:44	SCV x2	64/78		
72	8:45	Hellbat	66/78		
73	8:55	Refinery x2	66/78		
74	8:56	Medivac	68/78		
75	8:49	Supply Depot	68/78		
76	9:00	Hellbat	70/78	Move out with next drop.	
77	9:01	SCV x2	72/78		
78	9:11	Tech Lab	72/78	Add on to the newest Factory.	
79	9:11	Factory	72/78	Drop MULE	
80	9:15	Hellbat	74/78		
81	9:18	SCV x2	76/78	Control drops.	
82	9:35	SCV x2	72/86	Lost 6 supplies of units.	
83	9:39	Hellbat x2	76/86		
84	9:45	Hellbat	78/86		
85	9:51	SCV x2	80/86	Drop MULE	
86	10:00	Factory	80/86		
87	10:02	Supply Depot	80/86		
88	10:08	Siege Tank	81/86	Lost another 2 supplies worth of units.	

Step	Time	Unit/Structure	Supply	Notes	TvZ Build
89	10:09	SCV x2	83/86		
90	10:10	Medivac	85/86		
91	10:15	Orbital Command	83/97	Lost another 2 supplies worth of units.	
92	10:19	Engineering Bay	83/97		
93	10:31	SCV x2	85/97	Drop MULE	
94	10:40	Hellbat x2	89/97		
95	10:45	Tech Lab	89/97		
96	10:48	SCV x2	91/105		
97	10:51	Medivac	93/105		
98	10:57	Thor	99/105		
99	11:02	Refinery x2	99/105	Take 3 rd base – lift off your new Orbital Command	
100	11:03	Tech Lab	99/105	Add on to Factory	
101	11:03	Supply Depot x2	99/105		
102	11:05	+2 Vehicle Weap	99/105		
103	Final	N/A	N/A	Continue to train Thors and Hellbats and rally them to attack the front door. If you lost all your Hellbat drops or are going up against a larger number of Mutalisks, you may have to wait until you get a few Thors out. Secure your third expansion during this time.	

Zerg Builds Guide

Of all the races, the builds recommended in the Zerg section are the longest on average. Even the more aggressive Zerg timing attacks involve getting a fast expansion, which stretches out the length of all the builds. Fortunately, Zerg openings are all quite similar to one another. As a result, after you learn your first Zerg build with pro timings, learning subsequent openers is much easier since they are so similar.

Zerg vs Protoss Build

The Zerg vs Protoss match-up requires the Zerg player to be very flexible, as the Protoss player is hard to attack early in the game. Later in the game, perhaps more than any other match-up, it is important to consider the opponent's army composition. Being fast and efficient will go a long way, but you will start to hit a wall around the Platinum league where you have to be more cognizant of the units your opponent is building.

The first thing to understand is that the matches almost always last until at least the 8:00 mark before anything major happens. The reason for this delay is that there is nothing the Zerg player can do about the Protoss Forge Fast Expand build aside from working on their own economy in response. The other thing to understand is that Queens, a handful of Zerglings, and some automated defensive structures can handle any attack that comes earlier than 8:00 (the point at which a Protoss player may have 2 Immortals or 3+ Phoenix). As a result, aside from the low-ranked leagues, there is very little action in the first 8 minutes of ZvP.

The second thing you should know is that Protoss Gateway units are quite weak against the Hydralisk, whereas Colossi with Extended Thermal Lances and High Templar with Psionic Storm are very strong against the Hydralisk. Additionally, Corruptors are strong against Colossi, whereas Roaches are decent against High Templar and Archons on a cost (but not supply) basis. What I mean by this is you can get up to 200/200 on Roaches and Hydralisks for a much smaller resource investment than a Protoss player can get up to 200/200 supplies, and a 200/200 Roach army fares well against a 120/200 Protoss army that mixes in Archons and High Templar.

Since Zerg players can get a sizable number of Hydralisks and Corruptors out before the Protoss player can get a sizable number of Colossi or High Templar out, and Roach/Hydra fairs well against Tier 1/Tier 2 Protoss armies, there is a timing window when the Protoss player will be weak to large numbers of Roach/Hydra (and possibly Corruptors or Vipers). Our build below involves getting up to a quick 3 bases, getting out a sizable Hydralisk backbone, scouting out the opponent, then following up with a big wave of Roaches, Zerglings, Corruptors, and/or Hydralisks, depending on the enemy's army composition.

Step	Time	Unit/Structure	Supply	Notes	PvZ Build
1	0:01	Drone	7/10	Send Overlord to scout	
2	0:16	Drone	8/10		
3	0:29	Drone	9/10		
4	0:46	Overlord	9/10		
5	0:55	Drone	10/18		
6	1:11	Drone x2	12/18	Send Overlord to scout	
7	1:17	Drone	13/18		
8	1:31	Drone	14/18		
9	1:46	Drone	15/18		
10	1:57	Spawning Pool	14/18		
11	2:02	Drone	15/18		
12	2:17	Drone	16/18		
13	2:39	Hatchery	15/18	Might be up a few sec earlier if no delay	
14	2:46	Overlord	15/18	from enemy's Probe	
15	3:02	Queen	17/18		
16	3:04	Zerglings	18/18		
17	3:11	Drone	19/26		
18	3:17	Drone	20/26		
19	3:31	Drone	21/26		
20	3:49	Drone	22/26		
21	3:52	Queen	24/26	Inject Larva ASAP and send Queen to natural	
22	4:03	Extractor	23/26		
23	4:07	Overlord	23/26		
24	4:16	Drone	24/28		
25	4:20	Drone	25/28		
26	4:33	Drone	26/36	Move Drones to gas.	
27	4:40	Drone x5	31/36	Inject Larva at both bases.	
28	4:51	Overlord	31/36		
29	4:53	Zerglings	32/36		
30	4:58	Queen (at main)	34/36	Move Queen from main to natural.	
31	5:05	Overlord	34/36		
32	5:07	Zerglings	35/36		
33	5:21	Zerglings	36/44		
34	5:24	Drone x4	40/44	Inject Larva and drop Creep Tumors.	
35	5:30	Drone x3	43/52		
36	5:35	Metabolic Boost	43/52		
37	5:42	Overlord	43/52		
38	5:47	Drone x2	45/52		
39	5:54	Drone x2	47/52		
40	6:10	Hatchery	46/62	At 3 rd . Inject Larva / drop Creep Tumors	
41	6:20	Zergling x4	50/60		
42	6:28	Drone x2	50/60	Lost 2 pairs of scouting Zerglings, had to replace	
43	6:30	Extractor	49/60		

Step	Time	Unit/Structure	Supply	Notes	PvZ Build
44	6:33	Drone	50/60		
45	6:35	Roach Warren	49/60		
46	6:38	Drone x2	51/60		
47	6:45	Drone x2	53/60	Send a Queen to the third base.	
48	6:48	Drone	54/60		
49	6:51	Drone	55/60		
50	7:00	Overlord	55/60		
51	7:04	Drone	54/60	Lost 2 pairs of Zerglings that were out scouting	
52	7:09	Extractor x2	52/60	Move Drones to gas.	
53	7:15	Lair	52/60		
54	7:15	Drone x5	57/60		
55	7:24	Overlord x2	57/68		
56	7:25	Drone	58/68		
57	7:29	Drone	59/68		
58	7:36	Drone x2	61/68	Send a Queen to the third base.	
59	7:40	n/a	61/68	Inject Larva and drop/spread Creep Tumors	
60	7:42	Drone	62/68		
61	7:43	Evolution Chamber	61/68		
62	7:47	Drone	62/84		
63	7:55	Zerglings	68/86		
64	8:07	Drone x4	72/86		
65	8:12	Overlord x2	72/86		
66	8:15	Drone	73/86	Assume 1 Overlord lost to Phoenix or scouting	
67	8:22	Spore Crawler x3	70/78	Place 1 Crawler in each mineral line; inject larva	
68	8:26	Drone x2	72/78	and spread creep.	
69	8:37	Hydralisk Den	71/78		
70	8:41	+1 Missile Weapons	71/86		
71	8:43	Drone x4	75/86		
72	8:47	Drone x2	77/86		
73	8:51	Drone x2	79/86		
74	8:58	Overlord x2	79/86		
75	9:05	Overlord x2	79/86		
76	9:23	Hydralisk x6	91/110		
77	9:27	Extractor x2	89/110		
78	9:28	Hydralisk	91/110		
79	9:34	Hydralisk	93/118		
80	9:38	Hydralisk	95/118		
81	9:43	Drone x4	99/118		
82	9:46	Hydralisk	101/118		
83	9:47	Hydralisk	103/118		
84	9:55	Hydralisk x2	107/118		
85	10:04	Drone x4	105/118	Lost 3 Hydralisks in a skirmish, hence -6 supply	
86	10:12	Hydralisk x3	111/118		
87	10:19	Drone x5	116/118		

Step	Time	Unit/Structure	Supply	Notes	ZvP Build
88	10:24	Drone x2	118/118		
89	10:27	Grooved Spines	118/118		
90	10:31	Drone x2	116/118	Lost 2x Hydralisks in skirmish, hence -4 supply	
91	10:40	Hydralisk	118/118		
92	10:50	Spire	116/118		
93	Final	n/a	n/a	<p>Your next action should be to make a wave of Overlords and quickly get an idea of the army composition of your opponent. If there are only Gateway units, air units, and/or Immortals, you can make a big wave of Zerglings and go in for the attack right here. If there are Archons or High Templar, make a big wave of Roaches and go in at around 180/200 supplies. If there are Colossi, hold off for a minute and make a wave of 3 Corruptors per Colossus and then go in for the attack. You do need to attack quickly though – the opponent should not have time to get out Carriers, or High Templar plus Colossi. They should have to get just one of the other. If you stick to the timings, the opponent also will not have nearly as large of an army as yourself. Consider destroying the Protoss third and containing the enemy on two bases or performing “doom drop” if your opponent has a lot of Sentries and is being defensive.</p>	

Zerg vs Terran Build

This Zerg vs Terran build is by far the most aggressive of the Zerg openers. It is a variation of the classic two-base Baneling bust, where Zerg players get out a powerful wave of Roaches and Banelings in order to attack the Terran player early in the game before the Terran has time to get out the Marine trifecta of Stimpack, Combat Shields, and Medivac support. Without these 3 aids, Marines are very susceptible to both Banelings and Roaches. This leaves us with a good timing window to attack the Terran in the early game.

If you can get the timings down to a similar speed to the build order mentioned here, this will work well no matter how your opponent opens. Even if they try to play somewhat defensive, the speed at which you get out your units should be able to inflict major damage in all but the Master's and beyond league.

If you are already a Master's level player, this is still a good build to know as it is very effective when your opponent goes for a Macro Orbital Command. If the Terran player gets their 3rd Command Center early in the game, they are very vulnerable to this style of attack no matter how good they are. At the very top tiers of play, you might only want to commit to this build once you scout the presence of this 3rd Command Center before the 7:00 mark.

The key to making this attack work is to control your Banelings well. You only get a handful of them with this build, so you cannot waste them. In particular, a few Banelings need to be saved to break down the initial wall/bunker, while the remaining Banelings need to be used to take down clusters of workers. The Terran player can easily have 35+ SCVs by this stage of the game. If they send their SCVs on offense, the SCVs can actually take down your Roaches. When the SCVs cluster up in this manner, you need a couple of Banelings on hand so you can take the SCVs down instantly.

Step	Time	Unit/Structure	Supply	Notes	ZvT Build
1	0:01	Drone	7/10	Send Overlord out to scout	
2	0:16	Drone	8/10		
3	0:29	Drone	9/10	Drones temporarily cut to save for Overlord	
4	0:47	Overlord	9/10		
5	0:55	Drone	10/10		
6	1:12	Drone x2	12/18		
7	1:19	Drone	13/18	Send out a scouting Drone	
8	1:34	Drone	14/18		
9	1:48	Drone	15/18		
10	2:10	Hatchery	14/18		
11	2:14	Drone	15/18	Rally this Drone to form Spawning Pool in Step #13	
12	2:21	Drone	16/18		
13	2:43	Spawning Pool	15/18		
14	2:46	Drone	16/18		
15	2:51	Drone	17/18		
16	3:02	Drone	18/18		
17	3:18	Overlord	18/18	Banking resources for Queens	
18	3:49	Queen	20/26		
19	3:49	Zerglings x2	22/28		
20	3:50	Queen	24/28		
21	3:54	Zerglings	25/28	Zerglings & Queens chase away Reapers/Bunkers	
22	4:02	Overlord	25/28		
23	4:11	Drone	26/28		
24	4:17	Drone	27/28		
25	4:33	Drone	28/36		
26	4:39	Drone	29/36		
27	4:41	Queen x2	33/36	Inject Larva	
28	4:51	Overlord	33/36		
29	4:53	Drone x2	35/36		
30	5:00	Extractor x2	33/36		
31	5:08	Drone x2	35/36		
32	5:20	Drone	36/44		
33	5:25	n/a	36/44	Inject Larva & Drop Creep Tumors	
34	5:26	Drone x5	41/44		
35	5:28	Drone	42/44		
36	5:32	Drone	43/44	Move Drones to gas.	
37	5:42	Drone	44/44		
38	5:43	Overlord	44/44		
39	5:58	Roach Warren	43/44		
40	5:59	Metabolic Boost	43/44		
41	6:07	Drone	44/44		
42	6:10	Drone x3	47/52		
43	6:18	Baneling Nest	46/52	Inject Larva / Drop & Spread Creep Tumors	
44	6:24	Overlord	46/52		

Step	Time	Unit/Structure	Supply	Notes	ZvT Build
45	6:42	Overlord x3	46/52		
46	7:00	n/a	46/60	Inject Larva / Drop & Spread Creep Tumors	
47	7:05	Roach x7	60/60		
48	7:13	Roach x2	64/84		
49	7:20	Zergling x4	68/84		
50	7:26	Roach	70/84		
51	7:30	Overlord	70/84		
52	7:40	Overlord	70/84	Inject Larve / Drop & Spread Creep Tumors	
53	7:45	n/a	70/84		
54	7:50	Zergling x6	76/84		
55	8:05	Zergling x2	78/92		
56	8:13	Zergling x5	83/100		
57	8:18	Zergling	84/100		
58	8:22	Baneling x9	84/100	Use Zerglings that are close to enemy base but in a safe/hidden spot for this. Inject Larva / Drop & Spread Creep Tumors while waiting.	
59	8:40	Overlord	84/100		
60	8:48	n/a	84/100	Banelings finish morphing, Roaches in position – go in for the attack.	
61	8:50	Zergling x2	86/100	Rally these to main.	
62	9:00+	n/a	n/a	If your attack looks like you can win the game, use your next rounds of Larva on Roaches and Zerglings and rally those units to the Terran's base. If you inflict some damage but the Terran eventually holds your attack, grab an additional expansion, throw down a double Evolution Chamber, and start working on high tier units & upgrades for a late attack. If you inflict a lot of damage, moving quickly into Brood Lords can be a very effective strategy. Most Terrans will scramble to get out Siege Tanks / Missile Turrets / Widow Mines / Marines thinking you are about to follow up with more Roaches and Banelings or possibly Mutalisks. These units are all very susceptible to the Brood Lord. The last thing a Terran player is going to do when confronted by a Baneling/Roach bust is to get out Vikings.	

Zerg vs Zerg Build

Zerg vs Zerg used to be a very volatile match-up in Wings of Liberty, but build experimentation and unit changes have lead players to adopt builds involving relatively early expansions rather than the 1-base timing attacks that typify other mirror match-ups.

In particular, most Zerg vs Zerg games have 2 common threads: relatively early aggression with Zerglings & Banelings (and possibly Roaches) followed by a transition into Infestors or Mutalisk-based armies. In the late game, all sorts of units may be used. Ultralisks are particularly strong in Zerg versus Zerg simply because no Zerg unit can DPS them down quickly.

The only exception to this dynamic is on the Klontas Mire TE map. This map has such a short rush distance that you can run into a lot of trouble if you get a Hatchery before a Spawning Pool. For this reason, the build recommended on the following pages will involve a Spawning Pool before Hatchery. This allows you to use this build successfully on any map.

Our strategy will be to opt for a very tight Roach timing attack and using automated defense to deflect any attempts by your opponent to rush to Mutalisks. Getting the timings down on this build will allow you to get out a set of very early Roaches that can inflict major damage. This timing will allow you to win most ZvZs outright without ever going into the late game until you reach the Diamond league. From here, it is still a viable opener, but you may need to work on transitions into higher tier units if you only inflict damage without actually gaining a large enough advantage to win the game.

Step	Time	Unit/Structure	Supply	Notes	ZvZ Build
1	0:00	Drone	7/10	Send Overlord in to scout	
2	0:16	Drone	8/10		
3	0:24	Drone	9/10		
4	0:47	Overlord	9/10		
5	0:54	Drone	10/10		
6	1:12	Drone x2	12/18		
7	1:18	Drone	13/18		
8	1:33	Drone	14/18		
9	1:48	Drone	15/18		
10	1:55	Spawning Pool	14/18		
11	2:02	Drone	15/18		
12	2:17	Drone	16/18		
13	2:20	n/a	16/18	Send Drone over to natural expansion	
14	2:40	Hatchery	15/18	Build natural expansion.	
15	2:45	Overlord	15/18		
16	2:58	Extractor	14/18		
17	3:01	Queen	16/18		
18	3:08	Drone	17/18		
19	3:14	Drone	18/18		
20	3:18	Drone	19/26		
21	3:30	n/a	19/26	Move 3 Drones to gas.	
22	3:33	Drone	20/26		
23	3:49	Drone	21/26		
24	3:52	Queen	23/26	Inject Larva, move 1 st Queen over to natural expac.	
25	4:03	Overlord	23/26		
26	4:18	Drone	24/26		
27	4:23	Metabolic Boost	24/26	Sacrifice Overlord to scout Zerg.	
28	4:24	Drone	25/28		
29	4:33	Overlord	25/28		
30	4:39	Drone x3	28/28	Inject Larva x2	
31	4:47	Overlord	28/28		
32	4:55	Baneling Nest	27/28		
33	4:56	Drone	28/28		
34	5:00	Drone	29/36		
35	5:02	Zerglings	30/36		
36	5:10	Drone x2	32/36		
37	5:20	Drone	33/34	Inject Larva x2	
38	5:25	Drone x3	36/44		
39	5:28	Drone	37/44		
40	5:32	Zerglings	38/44		
41	5:35	Drone	39/44		
42	5:38	Drone	40/44		
43	5:41	Drone	41/44		
44	5:47	Overlord	41/44		

Step	Time	Unit/Structure	Supply	Notes	ZvZ Build
45	6:05	Drone x3	44/44	Inject Larva x2	
46	6:13	Drone x4	48/52		
47	6:19	Roach Warren	46/52	Lost a pair of Zerglings, -1 supply	
48	6:19	Extractor	45/52		
49	6:26	Zerglings x5	50/52		
50	6:35	Overlord	50/52		
51	6:39	Extractor	49/52		
52	6:46	Overlord	49/52		
53	6:51	Zerglings x2	51/52		
54	6:59	Overlord x2	51/60		
55	7:07	Baneling x2	51/60		
56	7:16	Roach x7	65/58		
57	7:21	Roach	67/68		
58	7:26	Lair	67/84		
59	7:32	Zerglings x2	69/84		
60	7:43	Overlord	69/84		
61	7:47	Drone x2	73/84		
62	8:00	Zerglings x7	80/84		
63	8:05	Baneling x5	80/84		
64	Final	n/a	n/a		

Blank Build Order Practice Sheets

There may come a time where one of the builds above does not work or you have already mastered all the builds above, have climbed the ranks, and now are looking to improve your arsenal even more. Perhaps you saw a really cool build order when watching a pro tournament. Perhaps a balance changed has made one of the builds in this book obsolete.

Whatever the reason you have for copying a new pro build order, on the following pages you will find a list of blank charts. I recommend printing these out (or making similar charts by hand), loading up a Starcraft 2 replay, and then writing the builds down by hand as you watch them unfold. I find that this is faster than tabbing back and forth between a game of Starcraft 2 and entering these digitally.\

Step	Time	Unit/Structure	Supply	Notes
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Step	Time	Unit/Structure	Supply	Notes
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Step	Time	Unit/Structure	Supply	Notes
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Hotkey Practice Sheets

There are three sets of charts on the following pages (2 for each race). You only need memorize the hotkeys for the race(s) you plan on playing competitively. The first chart contains a list of all the units and structures for your particular race and their associated hotkeys. Practice with this chart first, looking at it a few minutes at a time, several times per day, over a several day period. This is all the time that you need to invest to move on to the next step.

The second chart is just a blank chart consisting of a list of all the units and structures of that particular race. The drill with this chart will be to come up with a short sentence for each of the hotkeys associated with that particular unit as well as the hotkeys and locations of any upgrade associated with that unit. For example, for the “Marine”, you would say to yourself, “The Marine is trained at the Barracks with the hotkey ‘A’. It has the Stimpack ability which can be activated with hotkey ‘T’.” Note that I am not including +weapon/armor/shield upgrade hotkeys in the units section (only the structures section), but if you want to give yourself an extra challenge you can by mentally rehearsing upgrades in the same manner.

The third chart is the “answer key” to the second chart. Whenever you do not remember all the hotkeys associated with each unit, you can check this key to verify your answers.

Note: The rationale behind doing both of these drills to memorize hotkeys is discussed in the theoretical portion of the book and will not be rehashed here.

Protoss Hotkeys Practice Chart #1 - Units

Unit Name	Production Hotkey	Ability Hotkeys
Probe	"E" – Trained at Nexus	"G" – Gather Minerals "B" – Warp in Basic Structure "V" – Warp in Advanced Structure
Mothership Core	"M" – Trained at Nexus	"F" – Photon Overcharge "R" – Mass Recall "T" – Time Warp "U" – Upgrade to Mothership
Zealot	"Z" – Trained at Gateway	"C" – Charge
Sentry	"E" – Trained at Gateway	"F" – Force Field "G" – Guardian Shield "C" – Hallucination "N" – Hallucinated Archon "L" – Hallucinated Oracle "R" – Hallucinated Warp Prism Note other Sentry Hallucinations are their normal production key.
Stalker	"S" – Trained at Gateway	"B" – Blink
Dark Templar	"D" – Trained at Gateway	"C" – Archon Warp
High Templar	"T" – Trained at Gateway	"F" – Feedback "T" – Psionic Storm "C" – Archon Warp
Immortal	"I" – Trained at Robotics Facility	
Colossus	"C" – Trained at Robotics Facility	
Warp Prism	"A" – Trained at Robotics Facility	"E" – Convert into Phasing Mode "L" – Load Units "D" – Unload All Units
Observer	"B" – Trained at Robotics Facility	
Phoenix	"X" – Trained at Stargate	"G" – Graviton Beam
Void Ray	"V" – Trained at Stargate	"E" – Prismatic Alignment
Oracle	"E" – Trained at Stargate	"R" – Revelation "T" – Envision "C" – Activate Pulsar Beam "D" – Deactivate Pulsar Beam
Tempest	"T" – Trained at Stargate	
Carrier	"C" – Trained at Stargate	"I" – Build Interceptors
Mothership	"U" – Upgraded from Mothership Core	"T" – Time Warp "R" – Mass Recall

Protoss Hotkeys Practice Chart #1 - Structures

Structure Name	Production Hotkey	Research & Training Hotkeys
Nexus	"N" – Warped in by Probe	"E" – Train Probe "M" – Train Mothership Core "C" – Chrono Boost
Pylon	"E" – Warped in by Probe	
Assimilator	"A" – Warped in by Probe	
Gateway	"G" – Warped in by Probe	"G" – Convert into Warp Gate "Z" – Train Zealot "E" – Train Sentry "S" – Train Stalker "T" – Train High Templar "D" – Train Dark Templar
Cybernetics Core	"Y" – Warped in by Probe	"G" – Research Warp Gate Tech "E" – Research Air Weapons "A" – Research Air Armor
Warp Gate	"G" – Transformed from Gateway	"M" – Transform into Warp Gate "Z" – Warp Zealot "E" – Warp Sentry "S" – Warp Stalker "T" – Warp High Templar "D" – Warp Dark Templar
Forge	"F" – Warped in by Probe	"G" – Upgrade Ground Weapons "A" – Upgrade Ground Armor "S" – Upgrade Protoss Shields
Photon Cannon	"C" – Warped in by Probe	
Twilight Council	"C" – Warped in by Probe	"C" – Charge "B" – Blink
Stargate	"S" – Warped in by Probe	"X" – Train Phoenix "E" – Train Oracle "V" – Train Void Ray "T" – Train Tempest "C" – Train Carrier
Robotics Facility	"R" – Warped in by Probe	"B" – Train Observer "A" – Train Warp Prism "I" – Train Immortal "C" – Train Colossus
Templar Archives	"T" – Warped in by Probe	"T" – Research Psionic Storm
Dark Shrine	"D" – Warped in by Probe	
Fleet Beacon	"F" – Warped in by Probe	"R" – Research Anion-Pulse Crystals "G" – Research Graviton Catapult
Robotics Bay	"B" – Warped in by Probe	"B" – Research Gravitic Boosters "G" – Research Gravitic Drive "E" – Research Extended Thermal Lances

Protoss Hotkeys Practice Chart #2 – Units (blank)

Unit Name	Hotkeys
Probe	
Mothership Core	
Zealot	
Sentry	
Stalker	
Dark Templar	
High Templar	
Immortal	
Colossus	
Warp Prism	
Observer	
Phoenix	
Void Ray	
Oracle	
Tempest	
Carrier	

The blank chart allows you to perform this exercise on the computer if you do not have a printer to print out the charts. If you can print out the charts, just print out the chart with the answers and fold the paper in half so that the front “half” has the unit/structure names and the back half has the answers. This will save some ink and paper.

Protoss Hotkeys Practice Chart #2 – Units (answers)

Unit Name	Ability Hotkeys
Probe	The Probe is trained at the Nexus with hotkey “E”. It can use Gather Minerals (“G”), Warp in Basic Structure (“B”), and Warp in Advanced Structure (“V”).
Mothership Core	The Mothership Core is trained at the Nexus with hotkey “M”. It has the Time Warp (hotkey “T”), Mass Recall (hotkey “R”), and Photon Overcharge (hotkey “F”) abilities. It can morph into a Mothership with hotkey “U”.
Zealot	The Zealot is trained at the Warp Gate or Gateway with Hotkey “Z”. Its Charge ability can be researched at the Twilight Council with hotkey “C”. This ability can be cast with hotkey “C” as well.
Sentry	The Sentry is trained at the Warp Gate or Gateway with hotkey “E”. Its abilities are Force Field (“F”), Guardian Shield (“G”), and Hallucination (“H”).
Stalker	The Stalker is trained at the Warp Gate or Gateway with hotkey “S”. Its only ability is Blink, which is researched at the Twilight Council. Both the research and the ability use hotkey “B”.
Dark Templar	The Dark Templar is trained at the Warp Gate or Gateway with hotkey “D”. Its only ability is Archon Warp with hotkey “C”.
High Templar	The High Templar is trained at the Warp Gate or Gateway with hotkey “T”. Its abilities are Feedback (“F”), Psionic Storm (“T”), and Archon Warp (“C”). Psionic Storm is researched at the Templar Archives with hotkey “T”.
Immortal	The Immortal is trained at the Robotics Facility with hotkey “I”.
Colossus	The Colossus is trained at the Robotics Facility with hotkey “C”. Its Extended Thermal Lances upgrade can be researched at the Robotics Bay with hotkey “E”.
Warp Prism	The Warp Prism is trained at the Robotics Facility with hotkey “A”. It can convert into Phasing Mode with hotkey “E”. It uses “L” and “D” to load and unload units.
Observer	The Observer is trained at the Robotics Facility with hotkey “B”. Its Gravitic Boosters upgrade can be researched at the Robotics Bay with hotkey “B”.
Phoenix	The Warp Prism can be trained at the Stargate with hotkey “X”. It has the Graviton Beam ability which can be used with hotkey “G”. Its Anion Pulse-Crystals upgrade can be researched at the Fleet Beacon with hotkey “R”.
Void Ray	The Void Ray can be trained at the Stargate with hotkey “V”. Its Prismatic Alignment ability can be activated with hotkey “E”.
Oracle	The Oracle can be trained at the Stargate with hotkey “E”. Its abilities are Revelation (hotkey “R”), Envision (hotkey “T”), Activate Pulsar Beam (hotkey “C”), and Deactivate Pulsar Beam (hotkey “D”).

Tempest	The Tempest can be trained at the Stargate with hotkey "T".
Carrier	The Carrier can be trained at the Stargate with hotkey "T". It has the ability to build more Interceptors (hotkey "I"). Its Graviton Catapult upgrade can be researched at the Fleet Beacon with hotkey "G".
Mothership	The Mothership can be upgraded from the Mothership Core with hotkey "U". It has the Time Warp (hotkey "T") and Mass Recall abilities (hotkey "R").

Protoss Hotkeys Practice Chart #2 – Structures (blank)

Structure Name	
Nexus	
Pylon	
Assimilator	
Gateway	
Cybernetics Core	
Warp Gate	
Forge	
Photon Cannon	
Twilight Council	
Stargate	
Robotics Facility	
Templar Archives	
Dark Shrine	
Fleet Beacon	
Robotics Bay	

Protoss Hotkeys Practice Chart #2 – Structures (with answers)

Structure Name	
Nexus	The Nexus can be built by a Probe with “N”. It has the ability to train Probes (hotkey “E”) and the Mothership Core (hotkey “M”). It can Chrono Boost as well (hotkey “C”).
Pylon	The Pylon can be built by a Probe with “E”.
Assimilator	The Assimilator can be built by a Probe with “A”.
Gateway	The Gateway can be built by a Probe with “G”. It can convert into a Warp Gate with hotkey “G”. It can train the Zealot (hotkey “Z”), Sentry (hotkey “E”), Stalker (hotkey “S”), High Templar (hotkey “T”), and Dark Templar (hotkey “D”).
Cybernetics Core	The Cybernetics Core can be built by a Probe with “Y”. It can research Warp Gate Tech (hotkey “G”), Air Weapons (hotkey “E”), and Air Armor (hotkey “A”).
Warp Gate	The Warp Gate is transformed from the Gateway via hotkey “G”. It can transform back into a Gateway with hotkey “M”. The Warp Gate can warp in the Zealot (hotkey “Z”), Sentry (hotkey “E”), Stalker (hotkey “S”), High Templar (hotkey “T”), and Dark Templar (hotkey “D”).
Forge	The Forge can be built by a Probe with hotkey “F”. It can research ground weapons upgrades (hotkey “G”), ground armor (hotkey “A”), and Protoss shields (hotkey “S”).
Photon Cannon	The Photon Cannon can be built by a Probe with “C”.
Twilight Council	The Twilight Council can be built by a Probe with “C”. It can research the Charge ability with hotkey “C” and Blink with hotkey “B”.
Stargate	The Stargate can be built by a Probe with “S”. It can train the Phoenix (hotkey “X”), Oracle (hotkey “E”), Void Ray (hotkey “V”), Tempest (hotkey “T”), and Carrier (hotkey “C”).
Robotics Facility	The Robotics Facility can be built by a Probe with “R”. It can train the Observer (hotkey “B”), the Warp Prism (hotkey “A”), the Immortal (hotkey “I”), and the Colossus (hotkey “C”).
Templar Archives	The Templar Archives can be built by a Probe with “T”. It can research Psionic Storm with hotkey “T”.
Dark Shrine	The Dark Shrine can be built by a Probe with “D”.
Fleet Beacon	The Fleet Beacon can be built by a Probe with “F”. It can research Anion-Pulse Crystals with hotkey “R” and Graviton Catapult with hotkey “G”.
Robotics Bay	The Robotics Bay can be built by a Probe with “B”. It can research Gravitic Boosters with hotkey “B”, Gravitic Drive with hotkey “G”, and Extended Thermal Lances with hotkey “E”.

Terran Hotkeys Practice Chart #1 - Units

Unit Name	Production Hotkey	Ability Hotkeys
SCV	"S" – Trained at Command Center	"G" – Gather Minerals "B" – Build Basic Structure "V" – Build Advanced Structure "R" – Repair "T" – Halt Construction
Marine	"A" – Trained at Barracks	"T" – Stimpack
Reaper	"R" – Trained at Barracks	
Marauder	"D" – Trained at Barracks	"T" – Stimpack
Ghost	"G" – Trained at Barracks	"N" – Tactical Nuke Strike "F" – Hold Fire (Ghost goes into a non-reactive attack mode) "R" – Snipe "E" – EMP "C" – Cloak
Hellion	"E" – Trained at Factory	"D" – Hellbat Mode
Widow Mine	"D" – Trained at Factory	"E" – Activate Mine "D" – Deactivate Mine
Siege Tank	"S" – Trained at Factory	"E" – Siege Mode "D" – Tank Mode
Hellbat	"R" – Trained at Factory	"E" – Hellion Mode
Thor	"T" – Trained at Factory	"E" – High Impact Payload "D" – Explosive Payload
Viking	"V" – Trained at Starport	"D" – Assault Mode "E" – Fighter Mode
Medivac	"D" – Trained at Starport	"E" – Heal "B" – Ignite Afterburners "L" – Load "D" – Unload All
Raven	"R" – Trained at Starport	"T" – Build Auto-Turret "D" – Build Point Defense Drone "R" – Seeker Missile
Banshee	"E" – Trained at Starport	"C" – Cloak
Battlecruiser	"B" – Trained at Starport	"Y" – Yamato Cannon

Terran Hotkeys Practice Chart #1 - Structures

Structure Name	Production Hotkey	Research & Training Hotkeys
Command Center	"C" – Built by SCV	"S" – Train SCV "B" – Upgrade to Orbital Command "P" – Upgrade to Planetary Fortress "O" – Load "L" – Land / Lift Off
Supply Depot	"S" – Built by SCV	"R" – Lower / Raise
Refinery	"R" – Built by SCV	
Barracks	"B" – Built by SCV	"A" – Marine "R" – Reaper "D" – Marauder "G" – Ghost "X" – Tech Lab "C" – Reactor
Barracks Tech Lab	"X" – Built onto Barracks	"C" – Research Combat Shields "T" – Research Stimpack "G" – Research Concussive Shells
Engineering Bay	"E" – Built by SCV	"E" – Infantry Weapons "A" – Infantry Armor "H" – Hi-Sec Auto Tracking "N" – Neosteel Frame "B" – Upgrade Structure Armor
Bunker	"U" – Built by SCV	"L" – Load "D" – Unload All "V" – Salvage
Missile Turret	"T" – Built by SCV	
Sensor Tower	"N" – Built by SCV	
Factory	"F" – Built by SCV	"E" – Hellion "D" – Widow Mine "S" – Siege Tank "R" – Hellbat "T" – Thor "X" – Tech Lab "C" – Reactor
Factory Tech Lab	"X" – Built onto Factory	"I" – Infernal Pre-Igniter "C" – Drilling Claws "T" – Transformation Servos
Starport	"S" – Built by SCV	"V" – Viking "D" – Medivac "R" – Raven "E" – Banshee "B" – Battlecruiser "X" – Tech Lab / "C" – Reactor

Starport Tech Lab	"X" – Built onto Starport	"A" – Caduceus Reactor "D" – Durable Materials "T" – Corvid Reactor "C" – Research Cloaking Field
Ghost Academy	"G" – Built by SCV	"C" – Research Personal Cloaking "M" – Research Moebius Reactor "N" – Arm Silo with Nuke
Armory	"A" – Built by SCV	"E" – Upgrade Vehicle Weapons "V" – Upgrade Vehicle/Ship Plating "S" – Upgrade Ship Weapons
Fusion Core	"C" – Built by SCV	"R" – Research Weapon Refit "B" – Research Behemoth Reactor
Orbital Command	"B" – Upgraded from Command Center	"S" – Train SCV "E" – Calldown: MULE "X" – Calldown: Extra Supplies "C" – Scanner Sweep
Planetary Fortress	"P" – Upgraded from Command Center	"S" – Train SCV "O" – Load
Reactor	"C" – Built onto Barracks/Factory/Starport	

Terran Hotkeys Practice Chart #2 – Units (blank)

Unit Name	
SCV	
Marine	
Reaper	
Marauder	
Ghost	
Hellion	
Widow Mine	
Siege Tank	
Hellbat	
Thor	
Viking	
Medivac	
Raven	
Banshee	
Battlecruiser	

The blank chart allows you to perform this exercise on the computer if you do not have a printer to print out the charts. If you can print out the charts, just print out the chart with the answers and fold the paper in half so that the front “half” has the unit/structure names and the back half has the answers. This will save some ink and paper.

Terran Hotkeys Practice Chart #2 – Units (answers)

Unit Name	Production & Ability Hotkeys
SCV	The SCV is trained at the Command Center with hotkey “S”. It can be commanded with “G” to gather minerals, “B” to build basic structures, “V” for advanced structures, “R” to repair, and “T” to halt construction.
Marine	The Marine is trained at the Barracks with hotkey “A”. It has the Stimpack ability which can be used with hotkey “T”.
Reaper	The Reaper is trained at the Barracks with hotkey “R”.
Marauder	The Marauder is trained at the Barracks with hotkey “D”. It has the Stimpack ability with hotkey “T”.
Ghost	The Ghost is trained at the Barracks with hotkey “G”. It has the Tactical Nuke Strike ability with hotkey “N”, Hold Fire with hotkey “F”, Snipe with hotkey “R”, EMP with hotkey “E”, and Cloak with hotkey “C”.
Hellion	The Hellion is trained at the Factory with hotkey “E”. It can go into Hellbat mode with hotkey “D”.
Widow Mine	The Widow Mine is trained at the Factory with hotkey “D”. Activating the mine uses hotkey “E” and deactivating the mine uses hotkey “D”.
Siege Tank	The Siege Tank is trained at the Factory with hotkey “S”. It can go into Siege Mode with hotkey “E” and Tank Mode with hotkey “D”.
Hellbat	The Hellbat is trained at the Factory with hotkey “R”. It can enter Hellion mode with hotkey “E”.
Thor	The Thor is trained at the Factory with hotkey “T”. It can enter High Impact Payload mode with hotkey “E” and Explosive Payload mode with hotkey “D”.
Viking	The Viking is trained at the Starport with hotkey “V”. It can enter Assault Mode with hotkey “D” and Fighter Mode with hotkey “E”.
Medivac	The Medivac is trained at the Starport with hotkey “D”. It can use the “Heal” ability with hotkey “E”, Ignite Afterburners with hotkey “B”, load units with hotkey “L”, and Unload All with hotkey “D”.
Raven	The Raven is trained at the Starport with hotkey “R”. It can use Auto Turret with hotkey “T”, Point Defense Drone with hotkey “D”, and Seeker Missile with hotkey “R”.
Banshee	The Banshee is trained at the Starport with hotkey “E”. It can use Cloak with hotkey “C”.
Battlecruiser	The Battlecruiser is trained at the Starport with hotkey “B”. It can use Yamato Cannon with hotkey “Y”.

Terran Hotkeys Practice Chart #2 – Structures (blank)

Structure Name	
Command Center	
Supply Depot	
Refinery	
Barracks	
Barracks Tech Lab	
Engineering Bay	
Bunker	
Missile Turret	
Sensor Tower	
Factory	
Factory Tech Lab	
Starport	
Starport Tech Lab	
Ghost Academy	
Armory	
Fusion Core	
Orbital Command	
Planetary Fortress	
Reactor	

Terran Hotkeys Practice Chart #2 – Structures (with answers)

Structure Name	Production, Research & Training Hotkeys
Command Center	The Command Center can be built by an SCV with hotkey "C". It can train SCVs with hotkey "S", upgrade to an Orbital Command with hotkey "B", upgrade to a Planetary Fortress with hotkey "P", Load SCVs with hotkey "O", and Lift Off and Land with hotkey "L".
Supply Depot	The Supply Depot can be built by an SCV with hotkey "S". It can be lowered and raised with hotkey "R".
Refinery	The Refinery can be built by an SCV with hotkey "R".
Barracks	The Barracks can be built by an SCV with hotkey "B". It can train the Marine with hotkey "A", the Reaper with hotkey "R", the Marauder with hotkey "D", and the Ghost with hotkey "G". It can add on a Tech Lab with hotkey "X" and a Reactor with hotkey "C".
Barracks Tech Lab	The Tech Lab can be added onto the Barracks with hotkey "X". It can research Combat Shields with hotkey "C", Stimpack with hotkey "T", and Concussive Shells with hotkey "G".
Engineering Bay	The Engineering Bay can be built by an SCV with hotkey "E". It can research Infantry Weapons with hotkey "E", Infantry Armory with hotkey "A", Hi-Sec Auto Tracking with hotkey "H", Neosteel Frame with hotkey "N", and Upgrade Structure Armor with hotkey "B".
Bunker	The Bunker can be built by an SCV with hotkey "U". It can Load units with hotkey "L", Unload All with hotkey "D", and be Salvaged with hotkey "V".
Missile Turret	The Missile Turret can be built by an SCV with hotkey "T".
Sensor Tower	The Sensor Tower can be built by an SCV with hotkey "N".
Factory	The Factory can be built by an SCV with hotkey "F". It can produce the Hellion with hotkey "E", Widow Mine with hotkey "D", Siege Tank with hotkey "S", Hellbat with hotkey "R", and Thor with hotkey "T". It can add on a Tech Lab with hotkey "X" and a Reactor with hotkey "C".
Factory Tech Lab	The Tech Lab can be added onto the Factory with hotkey "X". It can research Infernal Pre-Igniter with hotkey "I", Drilling Claws with hotkey "C", and Transformation Servos with hotkey "T".
Starport	The Starport can be built by an SCV with hotkey "S". It can produce the Viking with hotkey "V", the Medivac with hotkey "D", the Raven with hotkey "R", the Banshee with hotkey "E", and the Battlecruiser with hotkey "B". It can add on a Tech Lab with hotkey "X" and a Reactor with hotkey "C".
Starport Tech Lab	The Tech Lab can be added onto the Starport with hotkey "X". It can research Caduceus Reactor with hotkey "A", Durable Materials with hotkey "D", Corvid Reactor with hotkey "T", and Cloaking Field with hotkey "C".

Ghost Academy	The Ghost Academy can be built by an SCV with hotkey "G". It can research Personal Cloaking with hotkey "C" and Moebius Reactor with hotkey "M". It can be armed with a nuke with hotkey "N".
Armory	The Armory can be built by an SCV with hotkey "A". It can research Vehicle Weapons with hotkey "E", Ship Weapons with hotkey "S", and Vehicle/Ship Plating with hotkey "V".
Fusion Core	The Fusion Core can be built by an SCV with hotkey "C". It can research Weapon Refit with hotkey "R" and Behemoth Reactor with hotkey "B".
Orbital Command	The Orbital Command can be upgraded from the Command Center with hotkey "B". It can train SCVs with hotkey "S", Calldown MULEs with hotkey "E", Calldown Extra Supplies with hotkey "X" and use Scanner Sweep with hotkey "C".
Planetary Fortress	The Planetary Fortress can be upgraded from the Command Center with hotkey "P". It can train SCVs with hotkey "S" and Load SCVs with hotkey "O".
Reactor	The Reactor can be built onto the Barracks, Factory, or Starport with hotkey "C".

Zerg Hotkeys Practice Chart #1 - Units

Unit Name	Production Hotkey	Ability Hotkeys
Drone	"E" – Morphed from Larva	"G" – Gather Minerals "B" – Morph Basic Structure "V" – Morph Advanced Structure "R" – Burrow/Unburrow
Overlord	"V" – Morphed from Larva	"V" – Morph to Overseer "G" – Generate Creep "L" – Load Units "D" – Unload All
Queen	"Q" – Birthed at Hatchery	"C" – Spawn Creep Tumor "V" – Inject Larva "T" – Transfusion "R" – Burrow/Unburrow
Zergling	"Z" – Morphed from Larva	"E" – Morph Baneling "R" – Burrow/Unburrow
Baneling	"E" – Morphed from Zergling	"X" – Explode "F" – Enable Structure Attack "R" – Burrow/Unburrow
Roach	"R" – Morphed from Larva	"R" – Burrow/Unburrow
Hydralisk	"H" – Morphed from Larva	"R" – Burrow/Unburrow
Mutalisk	"T" – Morphed from Larva	
Corruptor	"C" – Morphed from Larva	"C" – Corruption "B" – Morph to Brood Lord
Swarm Host	"A" – Morphed from Larva	"C" – Spawn Locust "R" – Burrow/Unburrow
Infestor	"F" – Morphed from Larva	"T" – Infested Terran "F" – Fungal Growth "E" – Neural Parasite "R" – Burrow/Unburrow
Viper	"E" – Morphed from Larva	"C" – Consume "D" – Abduct "B" – Blinding Cloud
Ultralisk	"U" – Morphed from Larva	"R" – Burrow/Unburrow
Brood Lord	"B" – Morphed from Corruptor	
Overseer	"V" – Morphed from Overlord	"C" – Spawn Changeling "E" – Contaminate
Creep Tumor	"C" – Spawned by Queen	"C" – Spawn Creep Tumor

Zerg Hotkeys Practice Chart #1 - Structures

Structure Name	Production Hotkey	Research & Training Hotkeys
Hatchery	"H" – Morphed from Drone	"S" – Select Larva "Q" – Birth Queen "B" – Evolve Burrow "P" – Research Pneumatized Carapace "G" – Set Worker Rally Point "L" – Evolve into Lair
Lair	"L" – Evolved from Hatchery	"S" – Select Larva "Q" – Birth Queen "B" – Evolve Burrow "P" – Research Pneumatized Carapace "E" – Evolve Ventral Sacs "G" – Set Worker Rally Point "H" – Evolve into Hive
Hive	"H" – Evolved from Lair	"S" – Select Larva "Q" – Birth Queen "B" – Evolve Burrow "P" – Research Pneumatized Carapace "E" – Evolve Ventral Sacs "G" – Set Worker Rally Point
Extractor	"E" – Morphed from Drone	
Spawning Pool	"S" – Morphed from Drone	"M" – Metabolic Boost "A" – Adrenal Glands
Evolution Chamber	"V" – Morphed from Drone	"M" – Melee Attacks "A" – Missile Attacks "C" – Ground Carapace
Roach Warren	"R" – Morphed from Drone	"G" – Glial Reconstitution "T" – Tunneling Claws
Baneling Nest	"B" – Morphed from Drone	"C" – Centrifugal Hooks
Spine Crawler	"C" – Morphed from Drone	
Spore Crawler	"A" – Morphed from Drone	
Hydralisk Den	"H" – Morphed from Drone	"G" – Grooved Spines "A" – Muscular Augments
Infestation Pit	"I" – Morphed from Drone	"G" – Pathogen Glands "E" – Neural Parasite "L" – Enduring Locusts
Spire	"S" – Morphed from Drone	"A" – Flyer Attacks "C" – Flyer Carapace "G" – Mutate into Greater Spire
Greater Spire	"G" – Mutated from Spire	"A" – Flyer Attacks "C" – Flyer Carapace
Nydus Network	"N" – Morphed from Drone	"N" – Birth Nydus Worm
Nydus Worm	"N" – Birthed from Nydus Network	"L" – Load / "D" – Unload All
Ultralisk Cavern	"U" – Morphed from Drone	"C" – Evolve Chitinous Plating

Zerg Hotkeys Practice Chart #2 – Units (blank)

Unit Name	Production & Ability Hotkeys
Drone	
Overlord	
Queen	
Zergling	
Baneling	
Roach	
Hydralisk	
Mutalisk	
Corruptor	
Swarm Host	
Infestor	
Viper	
Ultralisk	
Brood Lord	
Overseer	
Creep Tumor	

The blank chart allows you to perform this exercise on the computer if you do not have a printer to print out the charts. If you can print out the charts, just print out the chart with the answers and fold the paper in half so that the front “half” has the unit/structure names and the back half has the answers. This will save some ink and paper.

Zerg Hotkeys Practice Chart #2 – Units (answers)

Unit Name	Production & Ability Hotkeys
Drone	The Drone is morphed from Larva with hotkey “E”. The Drone can gather minerals with hotkey “G”, morph into basic structures with hotkey “B”, morph into advanced structures with hotkey “V” and burrow/unburrow with hotkey R.
Overlord	The Overlord is morphed from Larva with hotkey “V”. It can generate creep with hotkey “G”, Load with hotkey “L”, and Unload All with hotkey “D”.
Queen	The Queen is birthed from the Hatchery/Lair/Hive with hotkey “Q”. It can Spawn Creep Tumor with hotkey “C”, Inject Larva with hotkey “V”, use Transfusion with hotkey “T”, and burrow/unburrow with hotkey “R”.
Zergling	The Zergling is morphed from Larva with hotkey “Z”. It can mutate into a Baneling with hotkey “E” and burrow/unburrow with “R”.
Baneling	The Baneling is mutated from the Zergling with hotkey “E”. It can be commanded to explode via hotkey “X” and commanded to attack structures with hotkey “F”. It can burrow/unburrow with hotkey “R”.
Roach	The Roach is morphed from Larva with hotkey “R”. It can burrow/unburrow with hotkey “R”.
Hydralisk	The Hydralisk is morphed from Larva with hotkey “H”. It can burrow/unburrow with hotkey “R”.
Mutalisk	The Mutalisk is morphed from Larva with hotkey “T”.
Corruptor	The Corruptor is morphed from Larva with hotkey “C”. It can cast Corruption with hotkey “C” and mutate into a Brood Lord with hotkey “B”.
Swarm Host	The Swarm Host is morphed from Larva with hotkey “A”. It can cast the Spawn Locust ability with hotkey “C”. It can burrow/unburrow with hotkey “R”.
Infestor	The Infestor is morphed from Larva with hotkey “F”. It can spawn Infested Terrans with hotkey “T”, cast Fungal Growth with hotkey “F”, cast Neural Parasite with hotkey “E”, and burrow/unburrow with hotkey “R”.
Viper	The Viper is morphed from Larva with hotkey “E”. It can cast the Consume ability with hotkey “C”, Abduct with hotkey “D”, and Blinding Cloud with hotkey “B”.
Ultralisk	The Ultralisk is morphed from Larva with hotkey “U”. It can burrow/unburrow with hotkey “R”.
Brood Lord	The Brood Lord is mutated from the Corruptor with hotkey “B”.
Overseer	The Overseer is mutated from the Overlord with hotkey “V”. It can use Spawn Changeling with hotkey “C” and Contaminate with hotkey “E”.
Creep Tumor	The Creep Tumor is spawned by the Queen with hotkey “C”. Creep Tumors can also spawn 1 new Creep Tumor with hotkey “C”.

Zerg Hotkeys Practice Chart #2 – Structures (blank)

Structure Name	
Hatchery	
Lair	
Hive	
Extractor	
Spawning Pool	
Evolution Chamber	
Roach Warren	
Baneling Nest	
Spine Crawler	
Spore Crawler	
Hydralisk Den	
Infestation Pit	
Spire	
Greater Spire	
Nydus Network	
Nydus Worm	
Ultralisk Cavern	

Zerg Hotkeys Practice Chart #2 – Structures (with answers)

Structure Name	Production, Research & Training Hotkeys
Hatchery	The Hatchery is morphed from a Drone with hotkey "H". It can Select Larva with hotkey "S", Birth Queen with hotkey "Q", Evolve Burrow with hotkey "B", research Pneumatized Carapace with hotkey "P", Set Worker Rally Point with hotkey "G", and evolve into a Lair with hotkey "L".
Lair	The Lair is evolved from the Hatchery with hotkey "L". It can Select Larva with hotkey "S", Birth Queen with hotkey "Q", Evolve Burrow with hotkey "B", research Pneumatized Carapace with hotkey "P", evolve Ventral Sacs with hotkey "E", Set Worker Rally Point with hotkey "G", and evolve into a Hive with hotkey "H".
Hive	The Hive is evolved from the Lair with hotkey "H". It can Select Larva with hotkey "S", Birth Queen with hotkey "Q", Evolve Burrow with hotkey "B", research Pneumatized Carapace with hotkey "P", research Pneumatized Carapace with hotkey "P", evolve Ventral Sacs with hotkey "E", and Set Worker Rally Point with hotkey "G".
Extractor	The Extractor is morphed from a Drone with hotkey "E".
Spawning Pool	The Spawning Pool is morphed from a Drone with hotkey "S". It can research Metabolic Boost with hotkey "M" and Adrenal Glands with hotkey "A".
Evolution Chamber	The Evolution Chamber is morphed from a Drone with hotkey "V". It can research Upgrade Melee Attacks with hotkey "M", Upgrade Missile Attacks with hotkey "A", and Upgrade Ground Carapace with hotkey "C".
Roach Warren	The Roach Warren is morphed from a Drone with hotkey "R". It can research Glial Reconstitution with hotkey "G" and Tunneling Claws with hotkey "T".
Baneling Nest	The Baneling Nest is morphed from a Drone with hotkey "B". It can research Centrifugal Hooks with hotkey "C".
Spine Crawler	The Spine Crawler is morphed from a Drone with hotkey "C".
Spore Crawler	The Spore Crawler is morphed from a Drone with hotkey "A".
Hydralisk Den	The Hydralisk Den is morphed from a Drone with hotkey "H". It can research Grooved Spines with hotkey "G" and Muscular Augments with hotkey "A".
Infestation Pit	The Infestation Pit is morphed from a Drone with hotkey "I". It can research Pathogen Glands with hotkey "G", Neural Parasite with hotkey "E", and Enduring Locusts with hotkey "L".
Spire	The Spire is morphed from a Drone with hotkey "S". It can research Flyer Attacks with hotkey "A", Flyer Carapace with hotkey "C", and evolve into a Greater Spire with hotkey "G".
Greater Spire	The Greater Spire is evolved from the Spire with hotkey "G". It can research Flyer Attacks with hotkey "A" and Flyer Carapace with hotkey "C".

Nydus Network	The Nydus Network is morphed from a Drone with hotkey "N". It can birth a Nydus Worm with hotkey "N", load units with hotkey "L", and unload units with hotkey "D".
Nydus Worm	The Nydus Worm is birthed by the Nydus Network with hotkey "N". It can load units with hotkey "L" and unload units with hotkey "D".
Ultralisk Cavern	The Ultralisk Cavern is morphed from a Drone with hotkey "U". It can research Evolve Chitinous Plating with hotkey "C".

Sample Practice Regimens

You now have all the information, charts, and drills you need to start practicing with The Osiris Method. Below, you will find three sample practice regimens – one for players with only a little playtime (10 hours a week), a moderate amount of playtime (15 hours a week) or a lot of playtime (20 hours a week).

If you have extra playtime beyond 20 hours, simply increase the amount of time you perform each activity proportionally. Let's say for example you are on winter break from college and have 40 hours of week to play Starcraft 2 for the next month. Here, you would simply double the amount of time spent on each of the recommended drills. If you had 30 hours a week, you would increase the amount of time spent on each of the recommended drills by 50%.

Even if you are in the low playtime group, do not fret, as you can still get very highly ranked in Starcraft 2 while following The Osiris Method with just 10 hours of playtime a week. Within just a few weeks, you will start to see significant improvements in your rank. By the week 10, you should be able to master the 3 builds and practice them in enough games to achieve a very respectable rank in Starcraft 2.

Of course, if you dedicate more time to playing Starcraft 2 and practicing The Osiris Method, you can rank up even faster and ultimately reach even higher ranks on the Starcraft 2 ladder!

Note: Practice sessions do not have to be done all at once but rather performed over the course of the week. If you have zero time to play during the week but 5 hours to play on Saturday and Sunday, you can still follow the 10 hours per week plan. Of course, these are sample programs as well. Some people may have no time to play one week, then 30 hours to play the next week. Just follow through the practice programs in order and you will be fine no matter how you split up the hours.

Sample Practice Regimen 1 – 10 Hours a Week

Week 1: Hotkey Mastery & Build #1 Practice

- **First 2 Hours:** Print out the Hotkey sheets in the Osiris Method associated with the race you want to master. Perform the practice exercises until you memorize all the hotkeys.
- **Next 8 Hours:** Choose one of the three builds for your race and practice it for the rest of your Week 1 practice time. This will be all in a private games against the computer with regular pausing.

Week 2: Build #1 Practice

- **First 7 Hours:** Over the next 7 hours, continue to practice build #1 in private games against the computer. By the end of this practice time, you should be able to memorize this build entirely (or at least come very close).
- **Next 3 Hours:** Practice this build in unranked 1v1 games, no matter what the opponent's race. The goal here is not to win games but to practice your build without any pausing under a slightly stressful situation. Use the replay to compare what you did vs the build order chart after each game.

Week 3: Build #1 Practice & Learning Build #2

- **8 Hours:** Print or copy down a build from another race match-up. Start practicing this in private games against the computer in accordance with The Osiris Method for the first 8 hours of this week.
- **2 Hours:** Practice Build #1 in unranked 1v1 games just to keep it fresh.

Week 4: Build #1 Practice & Build #2 Mastery

- **7 Hours:** Continue to practice this in private games against the computer in accordance with The Osiris Method.
- **3 Hours:** Continue to Practice Build #1 in unranked 1v1 games just to keep it fresh.

Week 5: Build #1 and #2 Practice & Learning Build #3

- **6 Hours:** Print or copy down Build #3 from the builds section of The Osiris Method. Work on memorizing this in private games against the computer.
- **4 Hours:** Continue to practice Build #1 in unranked 1v1 games just to keep it fresh. Practice Build #2 in unranked 1v1 games as well. Each time you get the appropriate race match-up for Build #1 or Build #2, make sure you practice the right one. For the match-ups that take place against the race you are working on for Build #3, just alternate between Build #1 and #2 for now. If you want to be a jerk for your own benefit, you could always just leave the game whenever you get the race for the build you have not learned yet.

Week 6: Build #1 and #2 Practice & Learning Build #3

- **6 Hours:** Continue to practice Build #3 in private games against the computer
- **4 Hours:** Continue to practice Build #1 in unranked 1v1 games just to keep it fresh. Practice Build #2 in unranked 1v1 games as well. Each time you get the appropriate race match-up for Build #1 or Build #2, make sure you practice the right one. For the match-ups that take place against the race you are working on for Build #3, just alternate between Build #1 and #2 for now. If you want to be a jerk for your own benefit, you could always just leave the game whenever you get the race for the build you have not learned yet.

Week 7: Build #1 and #2 Practice & Build #3 Mastery

- **4 Hours:** Continue to practice Build #3 in private games against the computer.
- **6 Hours:** Practice all 3 builds in unranked 1v1 games. Since you now know 1 build for each race, use the appropriate build for the match-up you get.

Week 8: Ranked Play, Replays, & Refreshers

- **1 Hour:** Spend 1 hour total refreshing each build in private games against the computer to make sure your timings are on track with the recommended build.
- **7 Hours:** Time for ranked play! Spend 7 hours on the ranked ladder and get in as many games as you possibly can during this time. If it is a fresh ladder season, do not be surprised if you win all of your placement matches!
- **1 Hour:** Spend 1 hour reviewing your ladder match-ups in the replay
- **1 Hour:** Spend 1 hour watching professional level replays or shoutcasts of replays featuring your race. Analyze the professional's strategies in accordance with the strategies in this book.

Week 9 – Ranked Play & Replays

- **7 Hours:** Spend 7 hours on the ranked 1v1 ladder and get in as many games as you possibly can during this time.
- **1.5 Hours:** Spend 1.5 hours reviewing your ladder match-ups in the replay
- **1.5 Hours:** Spend 1.5 hour watching professional level replays or shoutcasts of replays featuring your race. Analyze the professional's strategies in accordance with the strategies in this book.

Week 10 (and beyond): Ranked Play, Replays, & Strategy

- **6.5 Hours:** Spend 6.5 hours on the ranked 1v1 ladder and get in as many games as you possibly can during this time.
- **1.5 Hours:** Spend 1.5 hours reviewing the replays of your ladder match-ups.
- **1.5 Hours:** Spend 1.5 hours watching professional level replays or shoutcasts.
- **30 Minutes:** Spend 30 minutes going over the match-up/race-specific strategy section of this book.

Repeat Week 10's schedule for the rest of the ladder season. If you need to learn a new build due to patch changes, you need to dedicate about 5 hours to that particular build a week for a couple weeks to be able to add it into your rotation. It is going to be hard to master more than 3 total builds within a single season playing just 10 hours or less a week though.

Sample Practice Regimen 2 – 15 Hours a Week

Week 1: Hotkey Mastery & Build #1 Practice

- **First 2 Hours:** Print out the Hotkey sheets in the Osiris Method associated with the race you want to master. Perform the practice exercises until you memorize all the hotkeys.
- **Next 13 Hours:** Choose one of the three builds for your race and practice it for the rest of your Week 1 practice time. This will be all in private games against the computer with regular pausing.

Week 2: Build #1 Mastery & Live Practice

- **First 10 Hours:** Over the next 10 hours, continue to practice build #1 in private games against the computer. By the end of this practice time, you should be able to memorize this build entirely.
- **Next 5 Hours:** Practice this build in unranked 1v1 games, no matter what the opponent's race. The goal here is not to win games but to practice your build without any pausing under a slightly stressful situation. Use the replay to compare what you did vs the build order chart after each game.

Week 3: Build #1 Live Practice & Learning Build #2

- **13 Hours:** Print or copy down a build from another one of your race match-ups. Start practicing this in private games against the computer in accordance with The Osiris Method for the first 13 hours of this week.
- **2 Hours:** Practice Build #1 in unranked 1v1 games just to keep it fresh.

Week 4: Build #2 Mastery& Build #1 and #2 Practice

- **7 Hours:** Continue to practice Build #2 in private games against the computer in accordance with The Osiris Method.
- **8 Hours:** Practice Build #1 and Build #2 in unranked 1v1 games. Use the appropriate build if the opponent's race matches up to the build. When you run into the third race, just pick one of your two builds at random or alternatively just leave the game.

Week 5: Build #1 and #2 Practice & Learning Build #3

- **11 Hours:** Print or copy down Build #3 from the builds section of The Osiris Method. Work on memorizing this in private games against the computer.
- **4 Hours:** Continue to practice Build #1 in unranked 1v1 games just to keep it fresh. Practice Build #2 in unranked games as well. Use the appropriate build if the opponent's race matches up to the build. When you run into the third race, just pick one of your two builds at random or alternatively just leave the game.

Week 6: Build #3 Mastery & All Builds Practice

- **9 Hours:** Continue to practice Build #3 in private games against the computer. You should be able to master this build by the end of this practice time.
- **1 Hour:** Spend 1 hour rehearsing Build #1 and #2 in private games against the computer. Review the timings and make sure everything is perfect.
- **5 Hours:** Spend the next 5 hours playing unranked 1v1 games, using all 3 builds against the appropriate race match-ups.

Week 7 and beyond: Live Ladder Games, Replays, & Study

- **10 Hours:** Play ranked 1v1 ladder games.
- **2 Hours:** Spend 2 hours a week watching your own replays from your ladder games.
- **2 Hours:** Spend 2 hours a week watching professional level replays or shoutcasts.
- **1 Hour:** Spend 1 hour reviewing the race-specific strategy section of this guide for your particular race. Once you have read through this section several times and know and understand the strategies, spend 1 hour a week reading or watching strategy updates. One option would be to watch something like Day[9]TV, read the TeamLiquid forums, follow the stream of a pro gamer, or read another reputable strategy website.

Repeat Week 7's practice schedule for the rest of the ladder season. If you need to learn a new build due to patch changes, you need to dedicate about 5 hours to that particular build a week for a couple weeks to be able to add it into your rotation. It is going to be hard to master more than 4-5 total builds within a single season playing just 15 hours or less a week though.

Sample Practice Regimen 3 – 20+ Hours a Week

Week 1: Hotkey Mastery & Build #1 Practice

- **First 2 Hours:** Print out the Hotkey sheets in the Osiris Method associated with the race you want to master. Perform the practice exercises until you memorize all the hotkeys.
- **Next 18 Hours:** Choose one of the three builds for your race and practice it for the rest of your Week 1 practice time. This will be all in private games against the computer with regular pausing. It will not be very fun to practice a build for this long, but you will have it down to a science by the time you are done.

Week 2: Build #1 Mastery, Build #1 Live Practice, Build #2 Practice

- **First 5 Hours:** Over the next 5 hours, continue to practice build #1. By the end of this practice time, you should be able to memorize this build entirely.
- **Next 7 Hours:** Practice this build in unranked 1v1 games, no matter what the opponent's race. The goal here is not to win games but to practice your build without any pausing under a slightly stressful situation. Use the replay to compare what you did vs the build order chart after each game.
- **Final 8 Hours:** Print out or copy a second build for another race match-up from The Osiris Method. Begin practicing it in private games against the computer.

Week 3: Build #2 Mastery, Live Practice Build #1 and #2, Build #3 Practice

- **12 Hours:** Continue to practice Build #2 in private games against the computer.
- **4 Hours:** Practice Build #1 and #2 in unranked 1v1 match-ups.
- **4 Hours:** Print out your third build and begin practicing it in private games against the computer.

Week 4: Build #3 Mastery & Build #1 and #2 Practice

- **16 Hours:** Continue to practice Build #3 in private games against the computer in accordance with The Osiris Method.
- **4 Hours:** Practice Build #1 and Build #2 in unranked 1v1 games. Use the appropriate build if the opponent's race matches up to the build. When you run into the third race, just pick one of your two builds at random or alternatively just leave the game.

Week 5: Practice, Ladder Games, and Replays

- **2 Hours:** Spend the first two hours of Week 5 refreshing your 3 builds in private games against the computer. Compare your timings your printed/copied build sheets and adjust accordingly.
- **6 Hours:** Spend 6 hours in unranked 1v1 match-ups practicing your builds. Do not use your builds at random; match the appropriate build to your opponent's race.
- **8 Hours:** Finally, you are ready to play ladder games. Spend 8 hours this week playing 1v1 ladder match-ups.
- **2 Hours:** Spend 2 hours reviewing your own replays from your ladder match-ups and analyzing these replays in accordance with The Osiris Method.
- **2 Hours:** Spend 2 hours watching pro-level replays or shoutcasts, following along with the questions in The Osiris Method.

Week 6 and beyond: Ladder Games, Replays, and Strategy

- **13 Hours:** Spend 13 hours per week playing 1v1 ranked ladder games.
- **3 Hour:** Spend 3 hours per week analyzing your replays from your ladder matches in accordance with the practice drills found in the Osiris Method book.
- **2 Hours:** Spend 2 hours per week watching pro-level replays and shoutcasts.
- **2 Hours:** Spend 2 hours per week studying Starcraft 2 strategy. The strategy sections of this book are a good start, but you will eventually finish all the material in this book. Other good strategy sites include the TeamLiquid forums as well as Day[9]TV's channel.

Repeat Week 6s practice schedule for the rest of the ladder season. If you need to learn a new build due to patch changes, you need to dedicate about 10 hours to that particular for 2 weeks in order to be able to work it into your rotation. If you have 20+ hours per week to play Starcraft 2 and are already highly ranked and want to rank higher, you will want to begin adding in multiple pro level builds in order to have different builds for different maps. Big, defensive maps can afford more economical builds, whereas smaller, less protected terrain boosts the effectiveness of more aggressive builds.

Conclusion

You now have the knowledge it takes to become a great Starcraft 2 player. You have all the charts and practice materials you need. The next step is simply following through with the program. The Osiris Method program only stops working when you get lazy about following the program. If you start laddering without fully mastering the timings of top-level builds, you are going to lose games. If you no longer watch your own replays as well as pro replays, you will stop improving. The same goes for watching replays but not watching them as an active participant – mindlessly watching replays without paying close attention and asking yourself the important questions is a waste of time.

Be sure to check the member's area on www.osirismethod.com regular updates. Also, visit www.osirissc2guide.com for free strategies and updates. Over the coming months, I hope to add extra builds here that you can learn and use in accordance with the practice program in The Osiris Method.

Lastly, tell your friends about the guide! The more copies the guide sells, the more time I can dedicate towards improving the quality of the book, adding new strategies & builds, and creating new practice materials. I have some great ideas for Use Map Settings custom training maps, so look for those in the future as well!

Reference List

1. Pashler, H. Dual Task Interference in Simple Tasks. *Psychological Bulletin*. 1994. Volume 116(2), p. 220-244. Available as of May 2013 for free download at:
http://www.pashler.com/Articles/Pashler_PB1994.pdf
2. Moran, Melanie. Training Can Improve Multitasking Ability. 2009 Interview for *Phys.Org*. Available as of May 2013 as an article: phys.org/news170015185.html
3. Chase, William & Simon, Herbit. Perception in Chess. 1973. *Cognitive Psychology*. Vol (4), p. 55-81.

While only two studies and an interview with researchers were referenced specifically from this book, there are literally thousands of studies that have confirmed the main tenets of The Osiris Method, namely that our Prefrontal Cortex cannot efficiently perform two tasks at once. This is known as Dual Task Interference. Additionally, our perceived ability to multitask is not true multitasking but rather our Prefrontal Cortex shifting its full attention rapidly between two (or more) tasks rather than simultaneously giving some attention to each of the tasks. This rapid shift in attention when “multitasking” can significantly hinder learning and reduce performance.

If you are interested in the topic and looking for more science on skill acquisition, learning, skill, and talent, several good books on the topic have already been written. While these books do not cover Starcraft 2, they do expand upon the science mentioned in The Osiris Method significantly:

- *Your Brain at Work* by David Rock
- *Talent Is Overrated* by Geoff Calvin
- *The Talent Code* by Daniel Coyle*

I have also read that *The Talent Code* by Daniel Coyle is a great resource in a similar vein of thought, but I have not read it yet so I cannot vouch for it – it is on my “to read” list though!

Contact

If you need any help or have any questions or comments, you can contact me at osirisguide [at] gmail.com. Just replace the [at] with @ and send away and I will get back to you as soon as possible.