



htpc Beginner

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Ultimate Guide to

Raspberry Pi OpenELEC Media Center



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PREFACE

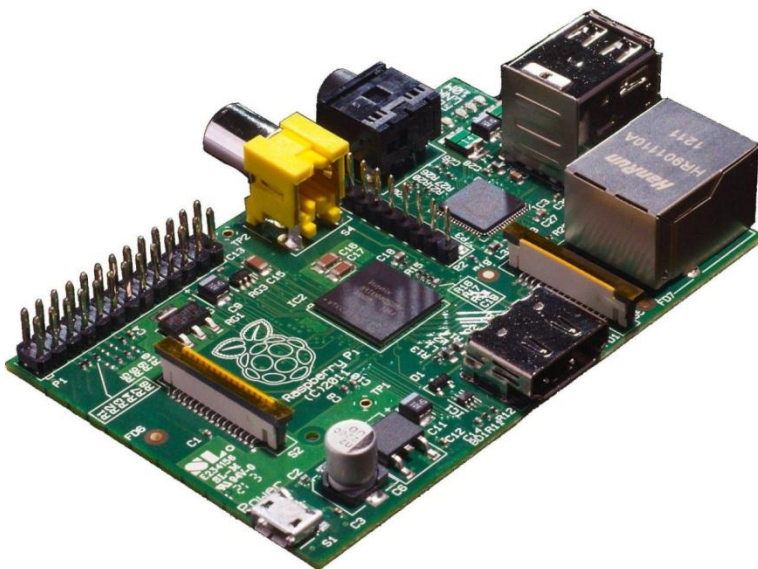
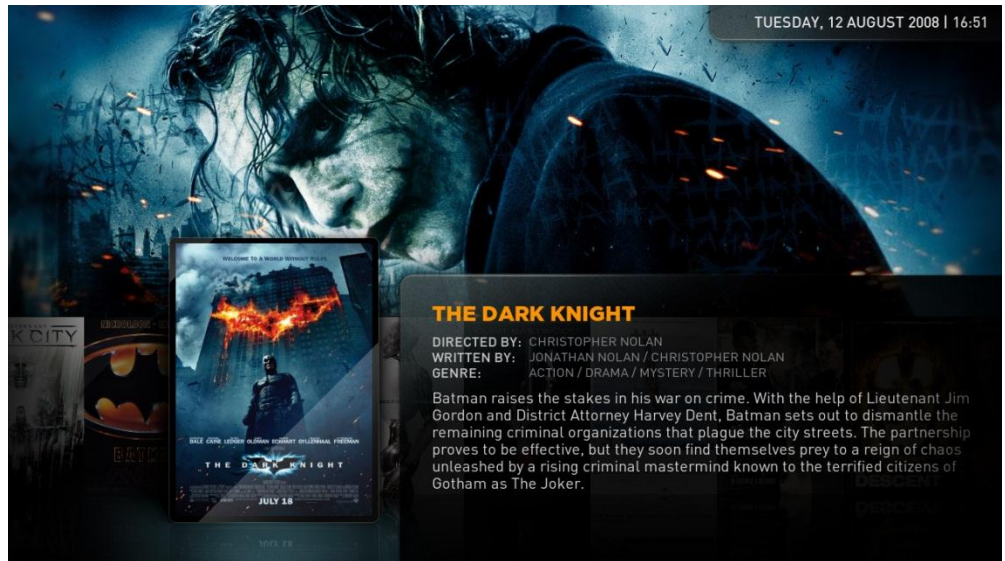
XBMC

XBMC is a free and open source media player developed by the XBMC

Foundation. It is a multi-platform media that allows

you to play movies, TV shows, music, and other media from local disk, remote server, or from the internet. It is a popular alternative to Windows Media Center for a HTPC (Home Theater PC). XBMC is highly customizable and extensible (with addons) and runs on several platforms including Windows, Linux, Mac, iOS, and Android. Home theater enthusiasts may unanimously agree that XBMC is the best

media center software available today. The best part: it's free!



Raspberry Pi

While originally developed for the Xbox, XBMC later was expanded and ported run on several devices. Until few of years back, a full PC was

needed run XBMC. Along came the Raspberry Pi Foundation with their \$25 (Revision A) credit-card sized boards, which they called “Raspberry Pi”. Several XBMC developers joined forces to make XBMC work on Raspberry pi.

The result:

- A dedicated always-on HD media center
- Extremely small form factor
- Ultra-low energy consumption (~3W)
- Less maintenance compared to a full-scale HTPC
- Complete operation through remote control
- Last but not the least significantly cheaper compared to a full-scale HTPC

Who is this book for?

Most HTPC newbies do not want to maintain a full-scale HTPC. Nor do they want to spend big bucks to buy one. A typical home user also does not want to run other services and wants to just turn on the TV and start watching their movies or TV shows. If you are one of them then this book is perfect for you. If not, don't worry this book still provides you access to some of the advanced features that will supercharge your Raspberry Pi XBMC media center.

What is in this book?

Buying the hardware is relatively simple. Buying a Raspberry Pi with accessories is even simpler. Comparatively, installing all HTPC software and having them integrate seamlessly to manage and play your media library. This book is all you

will need to know all accessories that need to be purchased. More importantly, this book will focus more on the software installation part, which can be challenging to folks who are not familiar with Linux or commandline environment.

Disclaimer

The author has made every effort to ensure that the information contained in this book is true and accurate. However, it is impossible to cover all possible scenarios in any situation or topic. This book is a collection of ideas that have generally worked for many and should be used as a guide only. We do not guarantee the results of scripts or methods presented in this book. Readers are urged to do their due diligence, investigate, and learn prior to following any methods listed in this book. The author is available to offer any help or suggestions through www.htpcbeginner.com but cannot be held responsible for any unexpected results.

ABOUT THE AUTHOR

Anand Subramanian, the founder and editor of `htpcBeginner`, has a doctorate degree in Food Science. He is a self-learned computer enthusiast and a part-time blogger. He has been dabbling with web designing, Flash, JavaScript, PHP, and MySQL since 2001 and has launched / maintained several websites. His first impression of Linux (Knoppix): “complex and unattractive”. His opinion has since changed and he became a near-full-time Linux user since Ubuntu 8.10 Intrepid Ibex.



Anand stepped into servers in the Ubuntu 9.04 Jaunty Jackalope era. He is a fan of running 24/7, low-cost, and energy-efficient home servers and HTPCs, serving files, playing media, and backing up files. He has been blogging since 2010 on Linux, Ubuntu, Home/Media/File Servers, WordPress, XBMC, and related HOW-TOs. Between spending time with his wife, playing with his dog, and working full-time as Food Scientist, he continues to find at least some time to continue his passion.

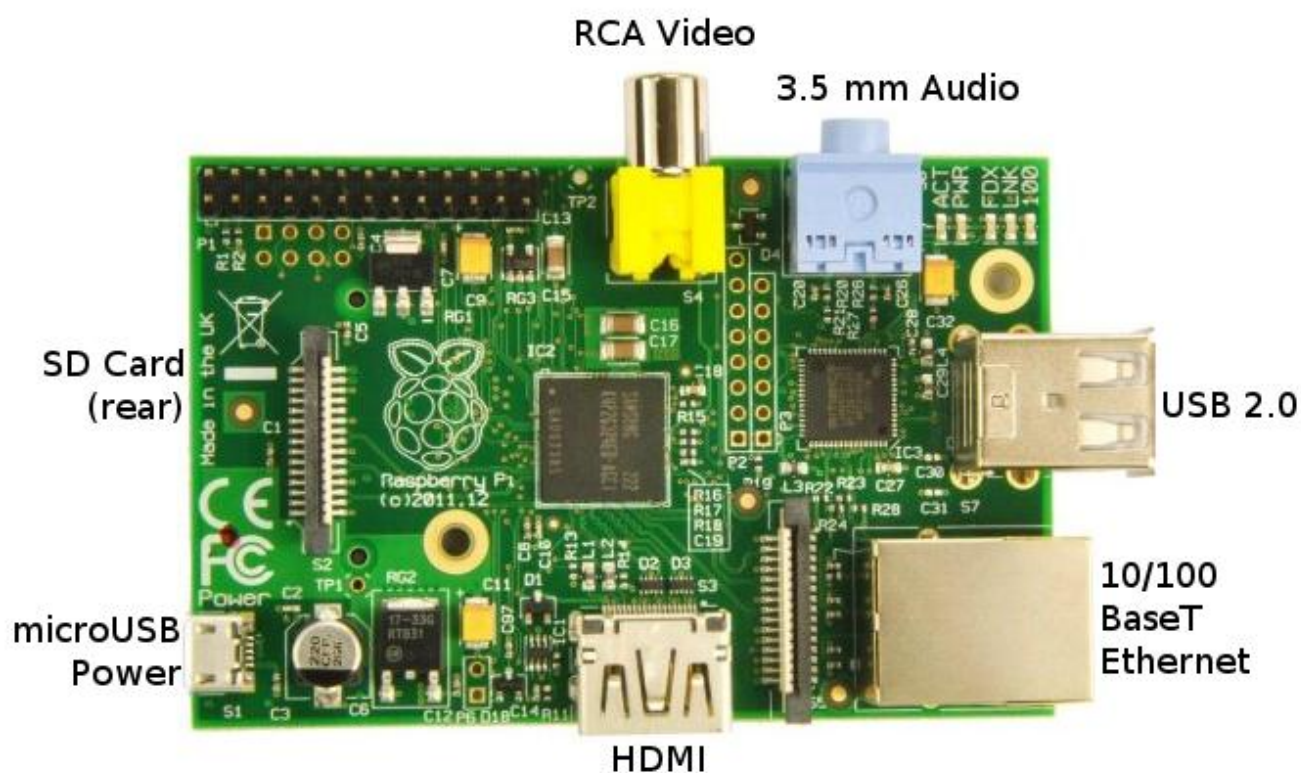
Anand is available through [Google+](#) and [Twitter](#).

Write for `htpcBeginner`

If you are interested in becoming a guest author for `htpcBeginner` please see the [Write for `htpcBeginner`](#) section of the website. It is a great way to get your knowledge out there, improve your blogging skills, interact with other HTPC enthusiasts, and earn some money.

CHAPTER 1: HARDWARE FOR RASPBERRY PI MEDIA CENTER

First, let us look at 7 Raspberry Pi accessories you may need to build a low-power HTPC. The objective is to be able to play media from a locally attached USB disk or a home server over network, on Raspberry Pi running XBMC. Raspberry Pi, the \$35 credit-card sized PC/board, has all the necessary outputs to accomplish this, including a HDMI port and 2 USB ports. The picture below shows a schematic of the locations of various ports on the Raspberry Pi board. Now let us look at what Raspberry Pi accessories you may need to build a good media center.



Raspberry Pi (Model B)

Raspberry Pi Accessories for Media Center

At the time of writing this book, almost all of the [media center software available for Raspberry Pi](#) were based on XBMC. No matter which operating system you decide to use, the Raspberry Pi accessories listed below may be needed. Note that these are just recommendations based on research and trials. You may find other accessories that fit your need better. The key is to make sure that the Linux drivers offer full support for these Raspberry Pi accessories and their hardware. A good reference guide to see all compatible hardware is available [here](#).

1. Audio and Video



Audio and video are integral part of any media center. The Model B Raspberry Pi supports both analog (RCA video and 3.5 mm audio) and digital formats (HDMI). Needless to say, if you want digital HD audio and video then HDMI is your only choice. Plus, you also reduce the number of cables running between devices. You can normally find great cables with latest standards for just a few dollars.

Recommendation: [Visit this page](#) for recommendations on compatible accessories.

If you for some reason you have trouble getting audio to work over HDMI, then head over to the [Raspberry Pi forum](#) and browse through threads on this topic like [this one](#).

2. USB Wifi Adapter



Wireless adapters are one the trickiest hardware pieces to get working in Linux. Thankfully, the open-source community has worked hard to list the Raspberry Pi compatible hardware [here](#). Several factors such as Wireless G or N, location, adapter's reception potential, etc. affect Wireless performance. In general, in this case its best to learn from others experience and do enough research prior to purchasing a wireless adapter for your Raspberry Pi.

Recommendation: [Visit this page](#) for recommendations on compatible accessories.

The operating system you run ([OpenELEC](#), Raspbian, Xbian, etc.) also influence the compatibility as some of them may have the drivers pre-installed. Those with Realtek chipsets tend to have better compatibility. If they do not work, you can use the following command to install the driver or [follow this thread](#):

```
sudo apt-get install firmware-realtek
```

3. USB IR Remote



A good remote is one of the most important Raspberry Pi accessories. Imagine having to get up and use the mouse or the keyboard to control or having to use your phone control your Raspberry Pi. I prefer to control my device using a IR remote: that way I can control everything using my Logitech Harmony universal remote.

[This page](#), lists all the remote that can be used with Raspberry Pi. One of the most common ways seems to be to get the [FLIRC USB dongle](#) and configure LIRC. For the basic purpose of being able to control XBMC on Raspberry Pi, it seems to be too much work and overkill. I recommend getting a very basic [cheap USB MCE remote](#) that mimics a keyboard and mouse.

Recommendation: [Visit this page](#) for recommendations on compatible accessories.

I currently, use this remote and have written in detail about [how to make this remote work with XBMC and Logitech Harmony remote](#).

4. SD Card



Probably least confusing of the Raspberry Pi accessories is the SD card. But it is a key component as it stores the operating system and is required for booting the Raspberry Pi. There are some SD cards that are not compatible. [This page](#) contains a long list of several SD card models and highlights whether they work with Raspberry Pi or not. Generally speaking if you get a standard SDHC card of a known brand it should work. Furthermore, performance on Class 10 SDHC cards seems to be the best. But it is always best cross check against [this list](#) prior to purchasing one.

Recommendation: [Visit this page](#) for recommendations on compatible accessories.

5. MicroUSB Power Cord



Needless to say, you need a power source to fire up your Raspberry Pi. It has a microUSB port as the power socket. You could use a microUSB charger (most smartphones use these), or go with a standard USB to microUSB power cable. Even better, you could get something that can do both. However, make sure that it is rated for an output of at least 1 Amp at 5 Volts or you will have problems with peripherals not working. If you use all ports, you may need a higher Amp (a ~2 Amp tablet or phone charger may work) adapter. If your Raspberry Pi does not boot up for some reason, check if your power supply is enough first before trying other things.

Recommendation: Visit [this page](#) for recommendations on compatible accessories.

If your Raspberry Pi will be connected to your TV (like in most cases) and you want it to be powered on when the TV is on and powered off when the TV turns off, then use the USB to microUSB power cable and power your Raspberry Pi using your TV's USB port.

6. Heatsink



A heatsink is not an absolute necessity. But if you plan to watch HD content for extended periods of times, then it could generate significant heat. This could amplify further if your Raspberry Pi is inside a case. In this situation, having a simple

passive heatsink to help dissipate some of the heat couldn't hurt. For a few dollars you can get a 3-piece heatsink to cool all necessary parts of the Raspberry Pi board.

Recommendation: Visit [this page](#) for recommendations on compatible accessories.



Raspberry Pi Heatsink Locations

7. Case



A case, like the heatsink is not required. But it is recommended to keep all the dust out of the Raspberry Pi board. There are tons of different cases, some very creative, available to choose from. They are described in detail [here](#). Some of them are expensive but in my opinion a simple case should work. If you choose to install a heatsink, then make sure that the case has openings to dissipate the heat. In fact, get a case with openings whatever the case may be.

Recommendation: Visit [this page](#) for recommendations on compatible accessories.

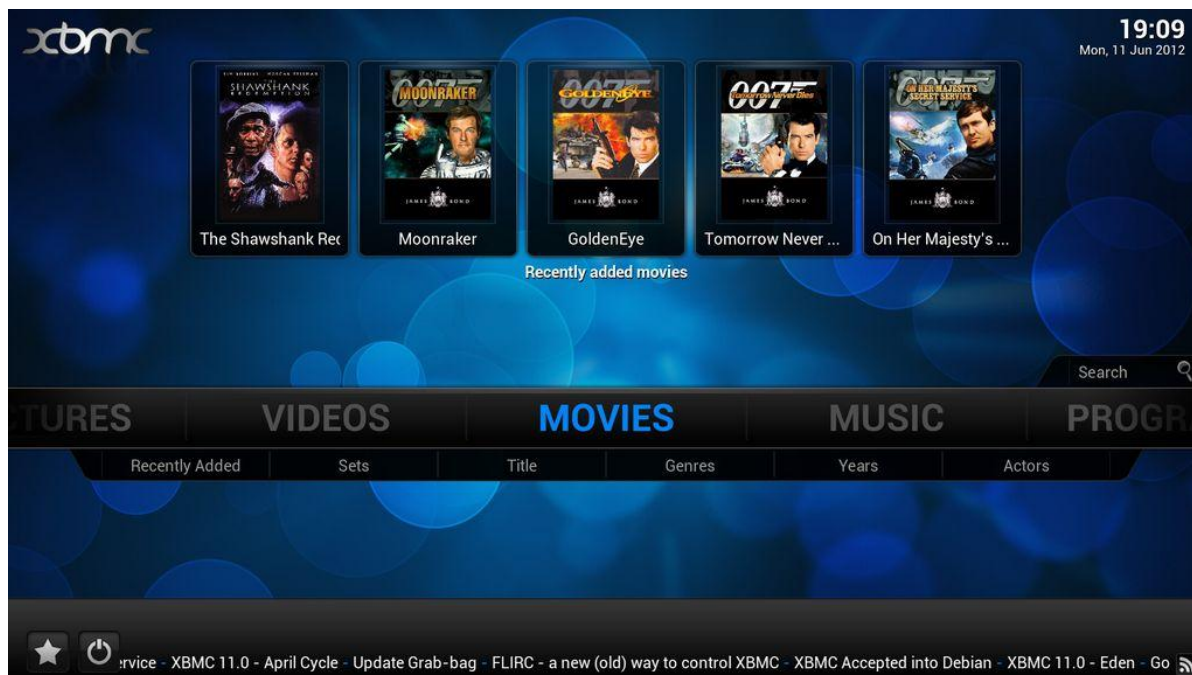
Of course a keyboard or a mouse could be *Raspberry Pi accessories*. However, I chose not to list them as once you install and configure your media center on Raspberry Pi, you would not need them (if you have a good remote). If you have to connect to your Raspberry Pi for any reason, you could SSH into it.

So there you go, that's all the basic Raspberry Pi accessories you may need to get your mini HTPC running.

Original full article is available [here](#).



CHAPTER 2: SOFTWARE FOR RASPBERRY PI MEDIA CENTER



Raspberry Pi is an extremely low power and ultra-compact (credit-card sized) computer board that is gaining a lot of attention due to the numerous creative application at very low power consumption. The current version of Raspberry Pi (ver B) supports Open GL 2.0, 1080p H.264, 512MB RAM, 10/100 BaseT ethernet, HDMI, 2 USB 2.0 ports, RCA video out, 3.5 mm audio out, SD Card socket (bootable), and is powered by microUSB. While it could be used for common PC applications, what makes it exciting for home server enthusiasts is the possibility of using it as a compact media player to play even 1080p videos. Based on this concept, several media center operating systems, mainly utilizing Linux and XBMC, have been developed in the recent time. In this chapter, I will introduce 4 great media center software for Raspberry Pi (operating systems to be accurate).

Media Center Software for Raspberry Pi

While you can several different operating systems, including [Arch Linux](#) and [Pidora](#) (based on Fedora), currently there are only 4 media center software for Raspberry Pi.

1. *OpenELEC*



OpenELEC is a lightweight operating system that can support high-definition content on machines with low-powered processors. This allows one to build small, silent machines to be effectively used as a media center. OpenELEC is built from the ground up specifically for one task, to run XBMC. Other operating systems are designed to be multi-purpose, so they include all kinds of software to run services and programs that won't be used. OpenELEC, however, only includes software required to run XBMC. Because of that it's tiny (100MB) and installs in seconds – literally – and boots extremely quickly (about 20 seconds normally).

OpenELEC not based on any Linux distribution and has been built from scratch specifically to act as a media center. It is designed to be managed as an appliance: it can automatically update itself and can be managed entirely from within the graphical interface. Even though it runs on Linux, you will never need to see a management console, command terminal or have Linux knowledge to use it. Some of its key features include:

- It's completely free
- A full install is only 80-125MB

- Minimal hardware requirements
- Simple install to HDD, SSD, Compact Flash, SD card, pen drive or other
- Optimized builds for Atom, ION, Intel, Fusion and more
- Simple configuration through the XBMC interface
- Plug and Play external storage
- File sharing out of the box

While we will discuss installation later in this book, [OpenELEC Installation Instructions](#) are also available through its Wiki page.

2. Raspbmc

[Raspbmc](#) is a minimal Linux distribution based on Debian that brings XBMC to your Raspberry Pi. Raspbmc is brought to you by the developer of the Crystalbuntu Linux Distribution, which brings XBMC and 1080p decoding to the 1st generation Apple TV. Some features include:



- Free and open source
- Supports both wired and WiFi out of the box!
- Multiple languages supported
- No knowledge of Linux is needed
- It can be installed with a few simple clicks from a Mac or a PC running Windows or Linux
- It's auto updating, meaning you constantly get new features, performance and driver updates

- It supports 1080p playback
- Share your content from your PC over NFS, SMB, FTP and HTTP and a USB drive in almost any format
- AirPlay and AirTunes support allow you to send music and video from your iDevice to the TV
- Full GPIO support!
- As it is a Debian system, it is completely expansive and you can install any packages from Debian's massive repository!

[Raspbmc Installation Instructions](#) are available through its website.

3. XBian

XBian is a small, fast and lightweight media center distro for the Raspberry Pi, based on a



minimal Raspbian image. Their slogan is "XBMC on Raspberry Pi, the bleeding edge" as their main focus is delivering the fastest XBMC solution for the Raspberry Pi. Some of its main features include:

- Fits on a 1GB SD card
- Low RAM usage and low CPU usage
- Very smooth UI
- Auto connect USB
- Support for AFP, NFS, AirPlay, CEC, Lirc, PVR
- Out of the box support for almost all [wireless network adapters](#)

- User friendly configuration with xbian-config
- Open source
- Very easy updatesystem

[XBian Installation Instructions](#) are available through its website.

4. GeeXbox

The last of the media center software for Raspberry Pi is GeeXbox. [GeeXboX](#) is a free and Open Source Media-



Center purposed Linux distribution for embedded devices and desktop computers. GeeXboX is not an application, it's a full-featured OS, that one can boot as a LiveCD, from a USB key, an SD/MMC card or install on its regular HDD. The GeeXboX distribution is lightweight and designed for one single goal: embed all major multimedia applications as to turn your computer into a HTPC. GeeXboX runs on x86, PowerPC and ARM devices.

GeeXbox was recently [ported to Raspberry Pi](#). Some of its notable features include:

- Open GL ES acceleration for XBMC
- 1080p HD video hardware decoding
- HDMI-CEC support
- AudioEngine with HD audio (DTS-MA and Dolby True-HD)
- Live TV and PVR

GeeXbox has not been officially released for Raspberry Pi yet. It is still undergoing development and may have bugs. But if you are bold enough, you can try one of the latest snapshots from the development tree.

[GeeXbox Installation Instructions](#) are available through its website.

Which one is best?

You will find that most reviews and comparisons conclude that this is a matter of personal preference. I agree with them. With the installation of these operating systems being so simple why not try each one out and then decide for yourself? Or try [NOOBS](#) (New out-of the box software), which allows you to switch between different operating systems. With that being said, my first choice would be OpenELEC as I (and others too) have found it to be most fluid. This is explained in more detail in the next chapter. Of course, this is only at this point of time. Development on each of the 4 media center software for Raspberry Pi are happening at a very rapid pace and you will find that all three of them offer similar features.

Original full article is available [here](#).



CHAPTER 3: WHY OPENELEC?



This chapter is a shootout of [OpenELEC](#) vs Xbian, with OpenELEC overclocked to the same level as Xbian. In my recent comparison of [Xbian](#), [OpenELEC](#), and [Raspbmc](#) ([Part 1](#) and [Part 2](#)), it was clear that Xbian was the fastest and most responsive operating system for Raspberry Pi media centers. One of the hidden factors in the comparison is that Xbian is, by default, overclocked to work at higher speeds. This may have slightly tilted the balance in favor Xbian. Moreover, most recent Xbian (1.0 Beta 1.1) was compared against OpenELEC 3.0.5 Stable and not the most recent version ([OpenELEC 3.1.6 Beta](#)). I had several requests, from including the OpenELEC developers requesting further information and pointing out that OpenELEC 3.1.6 brings new features with improvements in boot speeds. Therefore, I decided to give OpenELEC 3.1.6 a whirl, overclock it to the same level as Xbian, and compare the performance to that of Xbian. So here it goes, a comparison overclocked *OpenELEC vs Xbian* for Raspberry Pi media center.

Overclocked OpenELEC vs Xbian

It is important to understand that the primary objective is to run a low-power media center that can play HD video from home server through the wireless network. The comparison was on the barebones Raspberry Pi with a Transcend 8 GB Class 10 SD card. Note that all tests were done on the same SD card. After testing each OS, the card was fully formatted using [SD Card Formatter](#). Find the versions compared below and read on to know more about *Xbian vs Raspbmc or OpenELEC*.

- [Xbian 1.0 Beta 1.1](#) released on July 14th, 2013 left at default overclock settings (840 MHz CPU, 275 Mhz Core, 400 MHz SDRAM, and 0 Overvolt)
- [OpenELEC 3.1.6 Beta](#) released on August 20th, 2013 overclocked to 840 MHz CPU, 275 Mhz Core, 400 MHz SDRAM, and 0 Overvolt

Raspbmc was left out of this comparison because, in my [previous comparison](#), it was a distant third after Xbian and OpenELEC.

1. Ease of Installation

Nothing has really changed here. I still find Xbian installation the easiest. However, OpenELEC is not too far behind and takes only a couple of minutes extra. [On Linux](#), it's a matter of [downloading the compressed file](#), extracting it, and issuing a command to write the files to the SD card. On Windows, it is as easy as [downloading the image file](#) and writing it to the SD card with an image writer.

```
#####  
#  
#           OpenELEC.tv USB Installer           #  
#  
#####  
#  
#   This will wipe any data off your chosen drive   #  
#   Please read the instructions and use very carefully.. #  
#  
#####
```

OpenELEC Linux Installation

Winner: Xbian (OpenELEC is not too far behind).

2. Boot Speeds

Previous comparison showed that Xbian was the leader with an average of 37s, followed by OpenELEC (3.0.5) at 49s, and Raspbmc (July 2013 Update) at 78s. Well, overclocked OpenELEC vs Xbian showed a completely different picture. It is amazing how fast the recent OpenELEC version boots. Granted, overclocking also played a significant role in the faster boot speeds. Below are 5 recorded boot times (time taken to reach stable XBMC interface that is ready to navigate):

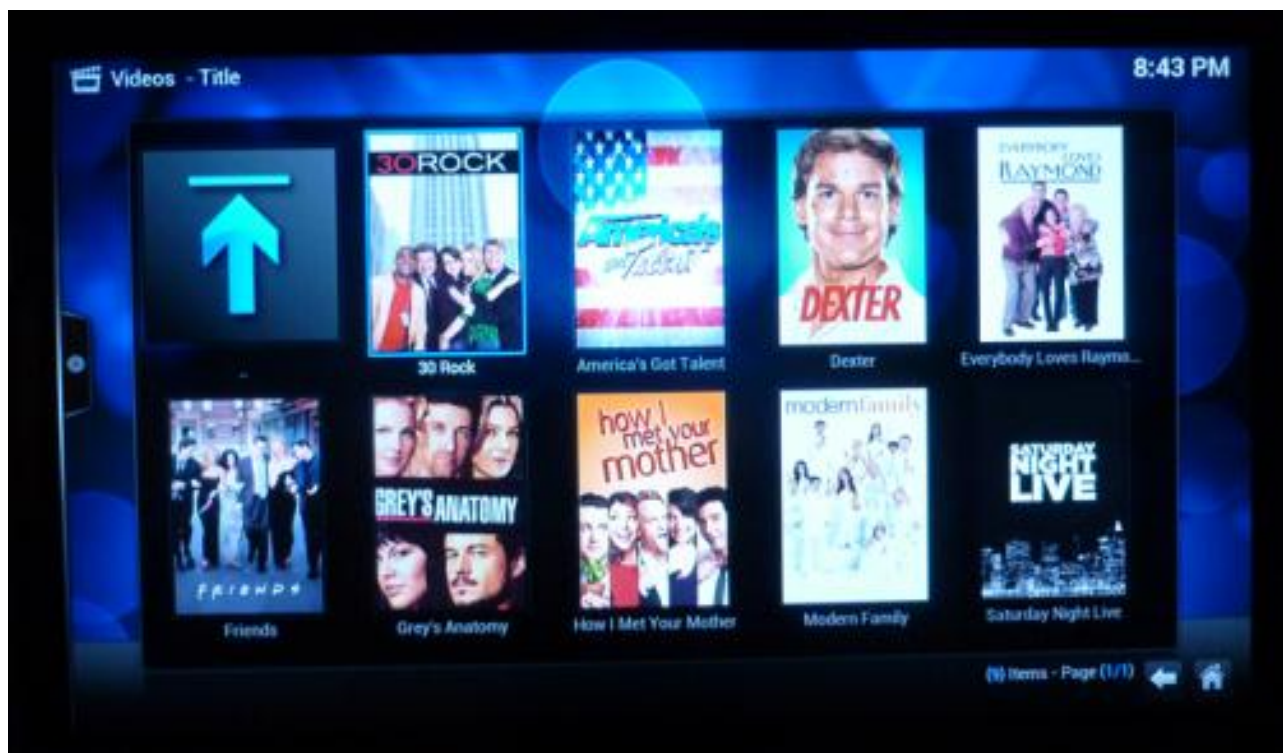
OS	1	2	3	4	5	Average
Xbian 1.0 Beta 1.1	38s	37s	37s	38s	36s	37s
OpenELEC 3.1.6	30s	32s	31s	31s	30s	31s

Clearly, overclocked OpenELEC 3.1.6 is better than Xbian and Raspbmc.

Winner: OpenELEC

3. Operation Speed

Operation speed of OpenELEC vs Xbian was compared by navigating to various windows, opening libraries, opening addons, opening settings, and changing library views. These tests were done after setting up a library of 212 Movies and ~1200 TV show episodes. Here too, Xbian was better initially. However, after overclocking OpenELEC both distros were neck and neck and I could not notice visible differences in the operational speeds.



OpenELEC Library Thumbnail View

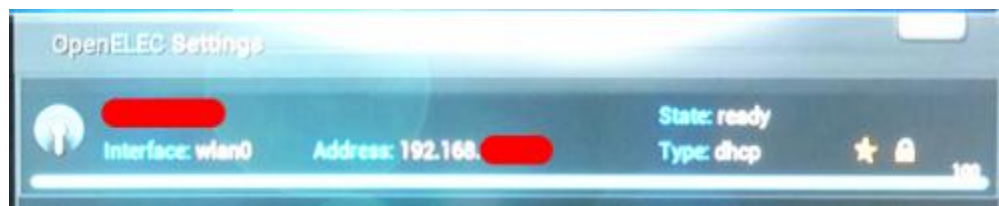
After a very brief initial post-boot lag (also present in Xbian), OpenELEC was very fluid.

Winner: OpenELEC and Xbian (Tie)

4. *Wireless Performance*

I am adding this category because; wireless performance is something that is important to me. My Raspberry Pi is connected to my Wireless Network through an Airlink 101 AWLL6075 USB Wifi adapter. After my [initial comparison](#) of OpenELEC vs Xbian vs Raspbmc. I settled with Xbian, but I started having problems with video playback from my home server. After few minutes, the video would sometimes freeze and the only way to move on was to cut and reconnect the power source. I may be wrong, but I am going to assume that this is a wireless related problem.

On the other hand in OpenELEC 3.1.6, not only was Wireless setup a breeze but my initial assessment shows that the performance was also much more stable.



OpenELEC Wireless Status

Winner: OpenELEC

5. *Options and Features*

In my [previous tests](#), Xbian clearly had the best options, features, and other less but nice-to-have bonuses. However, OpenELEC has clearly stepped it up in the 3.1.6 Beta release. I noticed several new updates and improvements, including the awesome boot and operational speeds presented above. OpenELEC settings menu has been improved and expanded to provide several options including: bluetooth

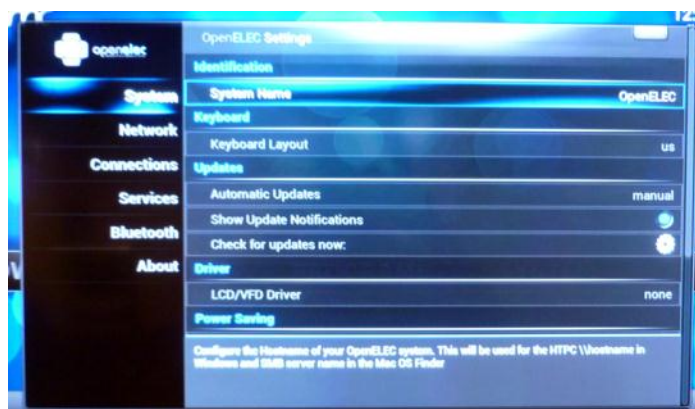
support, network settings, ability to mount network drives, clearer update options, XBMC backup options, and more.



OpenELEC Bluetooth Settings



OpenELEC Network Settings



OpenELEC Update Options



OpenELEC Configuration Wizard



OpenELEC Services - Initial Setup

One of the new, unique, and nice features I noticed was the first time boot OpenELEC configuration wizard. Basically, the first time you boot your Raspberry Pi

with OpenELEC, you will be presented with a very nice configuration wizard that walks you through various settings including Host Details, Wireless Setup, Services Setup, etc. I think that this is a great newbie-friendly feature.

While OpenELEC still lacks a package manager such as the one in Xbian to simplify installing apps such as [CouchPotato](#), [Sick Beard](#), or [Torrent clients](#), there have been significant improvements in the recent version. It all boils down to what one wants. For me, I do not intend to use my Raspberry Pi as a download server. As I mentioned earlier, my main objective is to setup a Raspberry Pi media center to play content from home server through the wireless network. So it is not going to be ON 24/7 but will turn ON or OFF with the TV. For this reason, I am changing my pick for options and features in OpenELEC vs Xbian, from Xbian to OpenELEC.

Winner: OpenELEC

6. Frills

One of the [problems I highlighted](#) in OpenELEC was the shutdown problems. That persisted in the new version. Sometimes I could not get the Raspberry Pi to power off successfully. It would freeze or it would restart the XBMC interface. But I was able to narrow this problem down to a specific situation. It only happened when I tried to power off Raspberry Pi while it was still performing the post-boot tasks (eg. initializing services such as SAMBA, SSH, etc.). After about 1 minute Power Off worked as expected. In real-world situations no one is going to be trying to power it off immediately after boot.

Another nice improvement I noticed is in the wireless setup. Like Xbian, OpenELEC now shows a list of available Wireless Networks for you to choose from. In addition, the Passphrase is now visible while you type it, making it mistake proof.

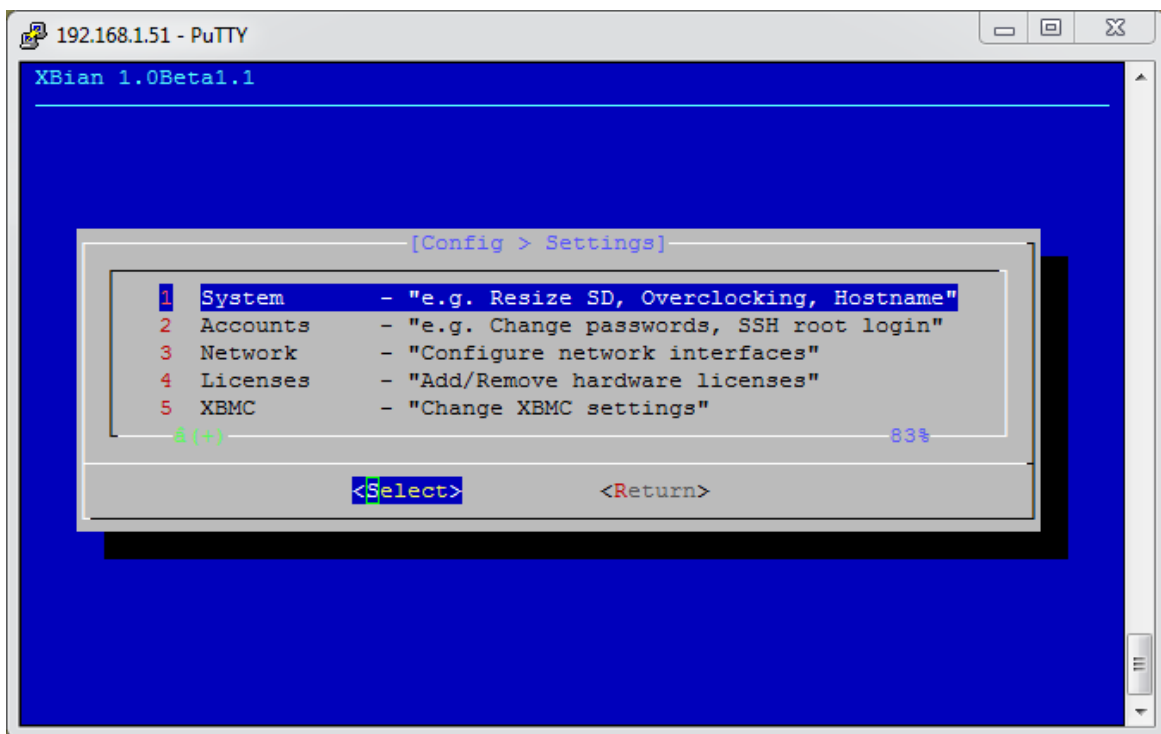


OpenELEC Wireless Setup



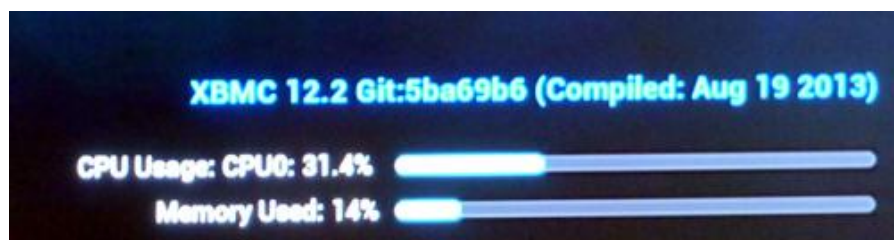
OpenELEC Wireless Passphrase

Nice boot/shutdown animations like in Xbian are still missing but if a system reliably boots and shuts down quickly, I do not mind not having these animations. Also missing are the commandline menu to configure/setup the system such as the one Xbian has. May be I haven't figured it out or not found it yet, but a commandline menu wouldn't be a bad thing to have.



XBian Settings Menu on SSH

Another improvement I noticed from OpenELEC 3.0.5 to 3.1.6 is the improvement in CPU load. In 3.0.5 my CPU load was constantly at 100%. But with 3.1.6 overclocked to 840 MHz, the CPU load hovered around 31% for the most part.



OpenELEC 3.1.6 CPU Load

Conclusions

I never expected my views to change within a matter of 2 weeks. Xbian was the clear standout in my initial assessment. As things stand right now, I think that for my purposes of running a stable reliable wireless Raspberry Pi media center

OpenELEC seems to have taken lead. But if you would prefer ease of installation of packages for apps such as [Sick Beard](#), [CouchPotato](#), [Transmission](#), etc. Xbian makes it much more easier for you.

If there is one thing that we can learn from this experience then it is that continuous development on these Raspberry Pi Media Center distros makes it harder for the end users to decide and stick with one distro. If you have ever rooted and tried custom ROMs on Android phones, then you would understand exactly what I am talking about. Nevertheless, I think the end users or the consumers are the winners here because we have these talented developers working hard to provide a better product and trying to accomplish the impossible task of satisfying everybody. At this point of time, for my situation, the answer to OpenELEC vs Xbian has tilted towards OpenELEC.

Note: *All three operating systems are under continuous development/improvement. The results presented apply only to the versions tested and are not indicative of performance of future versions.*

Original full article is available [here](#).



CHAPTER 4: OS INSTALLATION WITH NOOBS



[New Out of Box Software](#), or NOOBS allows you to install OS on Raspberry Pi with just a few clicks. The name 'NOOBS' explains everything: it is for newbies (or for anybody who likes it simple). We now the hardware and software that are available for building a XBMC media center on Raspberry Pi. We also know where OpenELEC has edge over other media center operating system. But I recommend that you try out other operating systems and decide for yourself. Install the operating system on the [SD card](#), formatting it and reinstalling the next one to try can be a big hassle. Apart from the time, you also need to know how to install the operating system. This is where *New Out of Box Software* (NOOBS) can come in handy.

The following quote summarizes that objective of the developers:

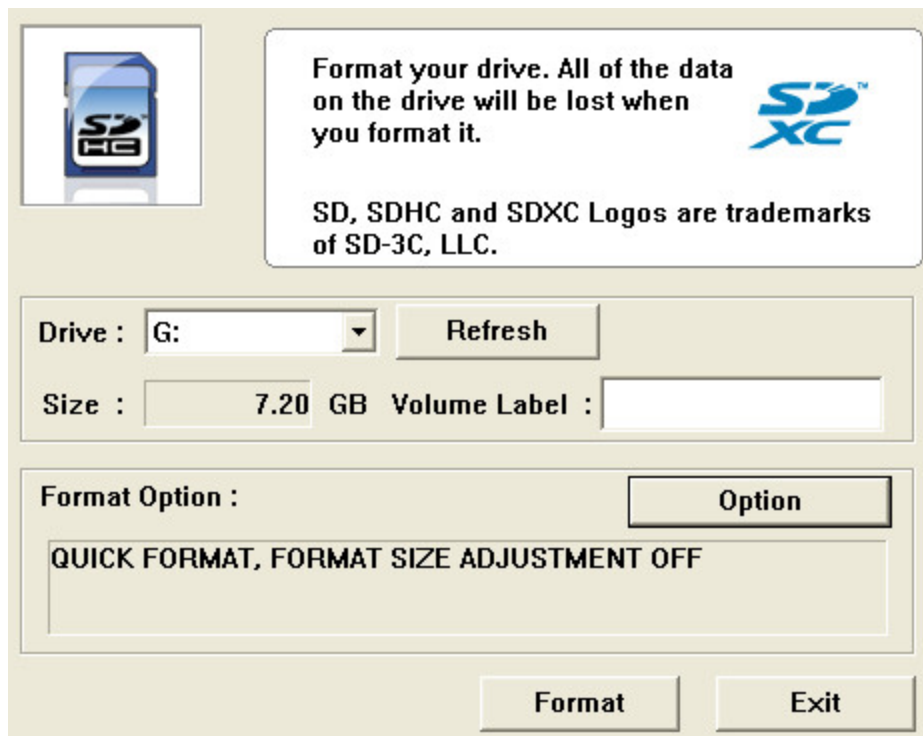
We started this project with the premise that throwing people in at the deep end and making them jump hurdles, to mix my sporting metaphors, is a good way to get them to learn stuff. It is: but it can also put some people off, sometimes terminally. And we don't want people to put their Raspberry Pi down in horror after five minutes.

Not only does NOOBS make it a cakewalk to setup Raspberry Pi with an OS, it also makes it very easy to recover or repair lost or corrupted partitions. At this point, NOOBS supports the following operating systems: [Raspbian](#), [OpenELEC](#), [RISC OS](#), [Pidora](#), [Arch](#), and [Raspbmc](#).

Preparing to Setup Raspberry Pi with NOOBS

To start, first you need a compatible SD Card of at least 4 GB capacity. Take a look at [this tutorial](#) for compatible SD card recommendations. Then format the SD card using [SD Association's Formatting Tool](#). Windows formatting tool has limitations (does not handle multiple partitions well) and therefore I recommend using SD Formatter instead.

Click on "Option" and set "FORMAT SIZE ADJUSTMENT" option to "ON", choose the correct SD card drive, and click "Format". Once done, you are ready to setup Raspberry Pi with any OS using NOOBS.



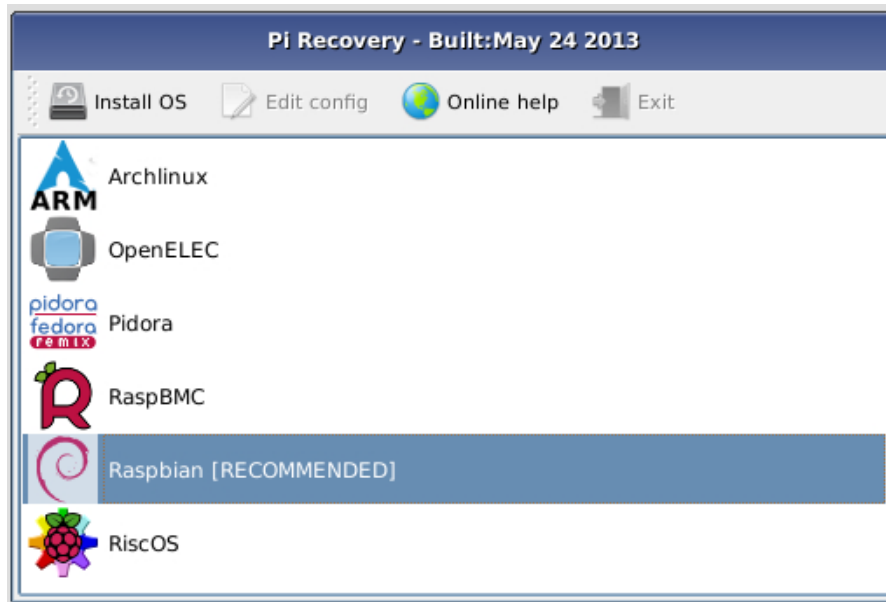
SD Formatter

Setup Raspberry Pi with NOOBS

To setup Raspberry Pi with New Out of Box Software, you do not need internet access or install any special software. Just follow the simple steps described below and you will be surprised how easy it is.

1. Visit the [NOOBS download page](#) and download the latest version of the NOOBS.
2. Extract the compressed file and copy of the contents to the root of the SD card.
3. Insert the SD card into Raspberry Pi and power it up.

Raspberry Pi should boot the NOOBS page and provide you with a list of several operating systems that you can install.



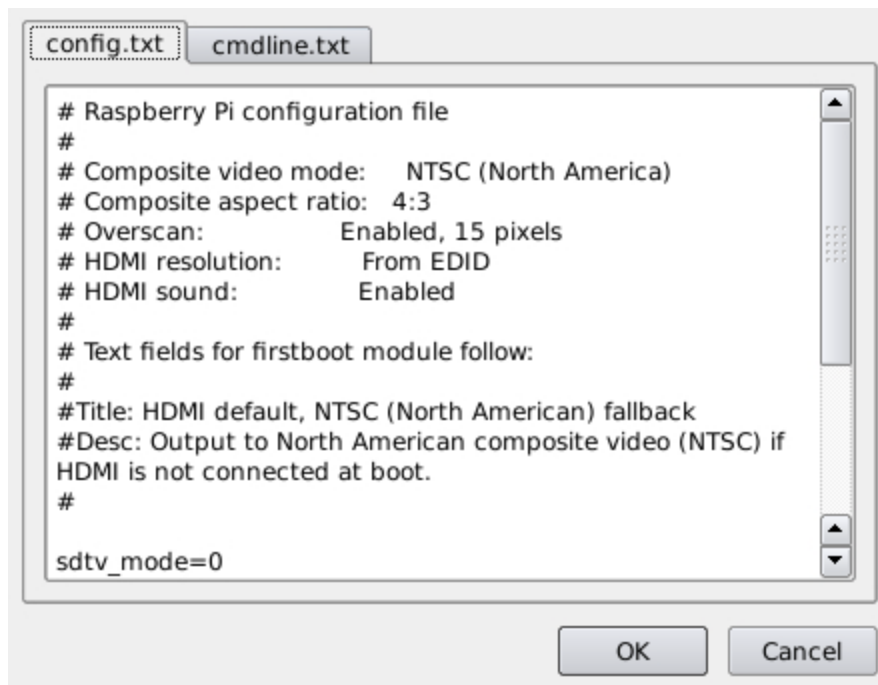
New Out of Box Software (NOOBS)

Just choose the operating system you want to install, let the installation proceed and complete, and that is it you are done. The next time your Raspberry Pi reboots you should boot into the OS you installed.

NOTE: By default, NOOBS will output over HDMI at your display's preferred resolution, even if no HDMI display is connected. If you do not see any output on your HDMI display or are using the composite output, press 1, 2, 3 or 4 on your keyboard to change HDMI modes.

Recovery

NOOBS creates a recovery partition on your SD card and stay resident on your card. You can hold shift key down during boot to enter the recovery interface. At this point, you may switch to a different operating system or reinstall the current operating system. In addition, there is also editor to the config.txt file for current OS and a web browser to quickly browse for help and information.



NOOBS config.txt Editor

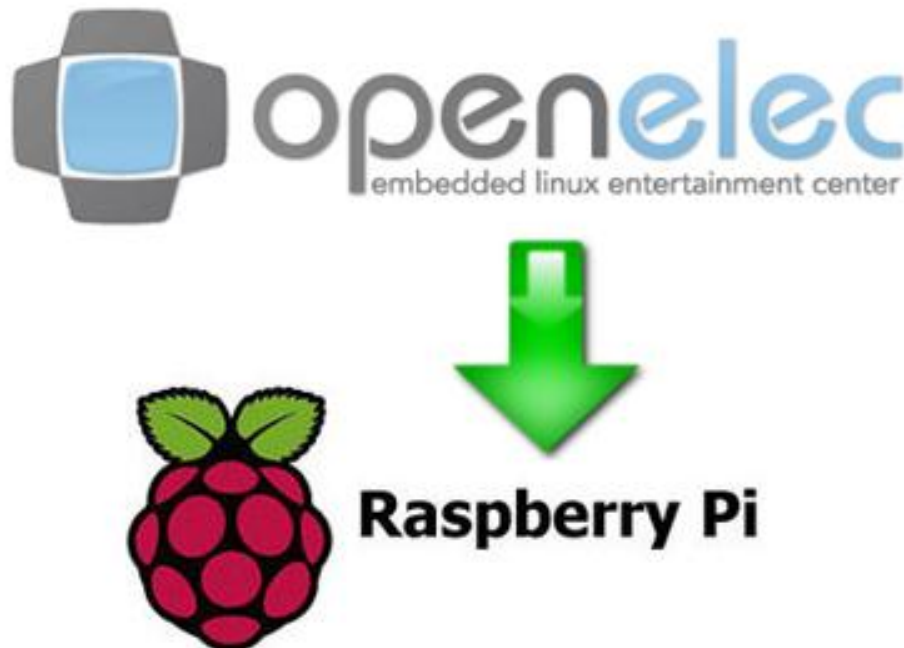
Conclusions

Kudos to the developers, setting up Raspberry Pi for the first time can now be much easier using New Out of Box Software (NOOBS). The ability to choose the OS allows you to boot a regular operating system like Raspbian, or a [media-center specific OS](#) like OpenELEC. Clearly this is a big help for newbies and takes out reading multiple wiki's to figure out the installation procedure for each OS. With a simple and inexpensive remote and New Out of Box Software (NOOBS), an awesome microcomputer or a media center is just a few click away.

Original full article is available [here](#).



CHAPTER 5: OPENELEC INSTALLATION FROM A LINUX SYSTEM



OpenELEC is one of the four media center operating systems available for Raspberry Pi. In this chapter, I will explain how to install OpenELEC on Raspberry Pi using a computer running Linux. OpenELEC has quickly become my favorite operating system for my [Raspberry Pi media center](#). In my comparisons, OpenELEC was the clear winner with ease of installation, speed, and performance. Some people might feel OpenELEC might be a bit restrictive but I think that the benefit is a much stable system. While you could also install OpenELEC on Raspberry Pi using NOOBS, some people might find installation on a Linux system is much simpler.

Download and Extract OpenELEC for Raspberry Pi

Download the latest version of OpenELEC build available for Raspberry Pi. Visit [this page](#), scroll down to the Raspberry Pi builds, and download the current version (as .tar file).

Open terminal and issue the commands below one at a time. First, cd into the folder where you downloaded the OpenELEC tar file. Typically, files are downloaded in to the “Downloads” folder on Ubuntu (unless you specified a different location). Then extract the tar file and cd into the OpenELEC folder.

```
cd ~/Downloads  
tar xvf OpenELEC-RPi.arm-3.2.4.tar  
cd OpenELEC-RPi.arm-3.2.4
```

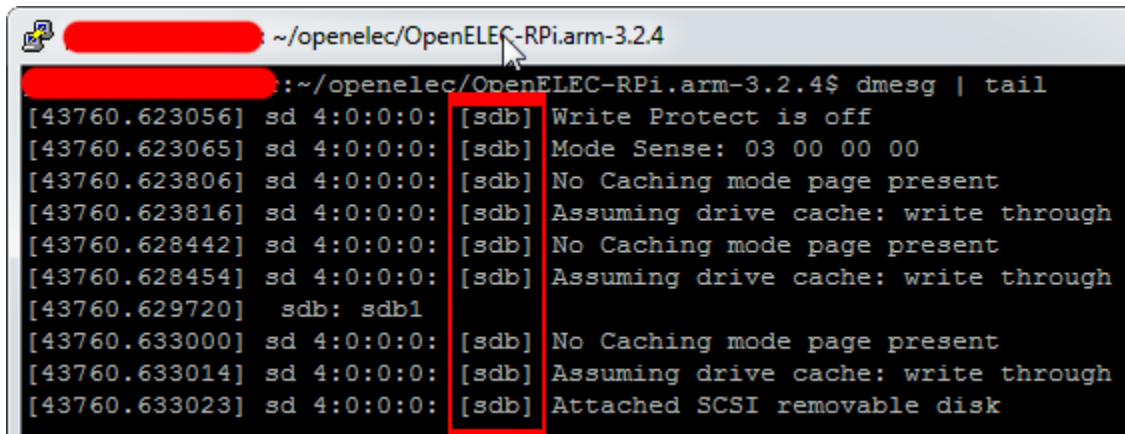
At the time of writing this book the latest version of OpenELEC was 3.2.4. Replace “3.2.4” in the above commands with the version number in the tar file you downloaded. You are now ready to install OpenELEC on Raspberry Pi.

Determine SD Card Path

If you have not already done so, I suggest that you consider purchasing the [recommended accessories for the Raspberry Pi media center](#). One of the most important accessories is a good and compatible SD Card. Insert the SD card into the slot and identify its path. This step is very critical as specifying a wrong device path could wipe out data in the wrong drive. To determine the correct device path for the SD card, issue the following command in the terminal window.

`dmesg | tail`

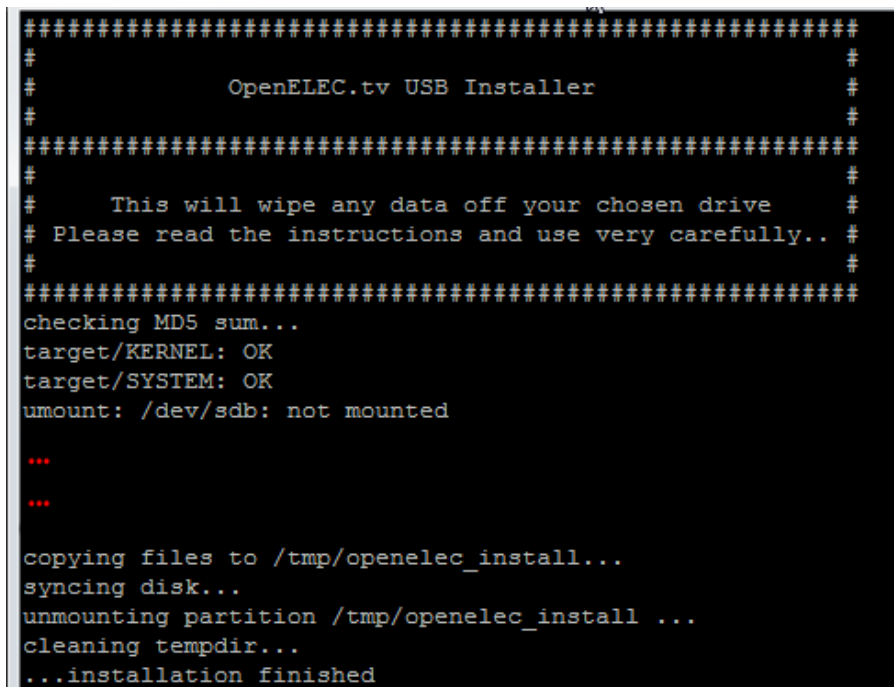
The output should look something like what is shown in the picture below. Your SD card's device id will be in the format "sdX", where X can be a,b,c, etc. (but it is almost never a). In this case, the SD card's device id is "sdb".



```
~/openelec/OpenELEC-RPi.arm-3.2.4
~/openelec/OpenELEC-RPi.arm-3.2.4$ dmesg | tail
[43760.623056] sd 4:0:0:0: [sdb] Write Protect is off
[43760.623065] sd 4:0:0:0: [sdb] Mode Sense: 03 00 00 00
[43760.623806] sd 4:0:0:0: [sdb] No Caching mode page present
[43760.623816] sd 4:0:0:0: [sdb] Assuming drive cache: write through
[43760.628442] sd 4:0:0:0: [sdb] No Caching mode page present
[43760.628454] sd 4:0:0:0: [sdb] Assuming drive cache: write through
[43760.629720] sdb: sdb1
[43760.633000] sd 4:0:0:0: [sdb] No Caching mode page present
[43760.633014] sd 4:0:0:0: [sdb] Assuming drive cache: write through
[43760.633023] sd 4:0:0:0: [sdb] Attached SCSI removable disk
```

Determine SD Card Device Path

Install OpenELEC on Raspberry Pi



```
#####
#
#           OpenELEC.tv USB Installer
#
#####
#
#   This will wipe any data off your chosen drive
#   Please read the instructions and use very carefully..
#
#####
checking MD5 sum...
target/KERNEL: OK
target/SYSTEM: OK
umount: /dev/sdb: not mounted
...
...

copying files to /tmp/openelec_install...
syncing disk...
unmounting partition /tmp/openelec_install ...
cleaning tempdir...
...installation finished
```

Install OpenELEC on Raspberry Pi

Issue the following command to install OpenELEC on Raspberry Pi.

```
sudo ./create_sdcard /dev/sdX
```

Replace "sdX" with the device id (in this case sdb) of the SD card you determined above. Let the installation proceed and come to completion.

Verify OpenELEC Installation

Before closing all windows, ensure that OpenELEC was installed successfully by issuing the following command:

```
sync
```

That is it. You may now remove your SD card, insert it into your Raspberry Pi, and proceed with configuring OpenELEC. Go head install OpenELEC on Raspberry Pi and enjoy your media center.

Original full article is available [here](#).



CHAPTER 6: ADDITIONAL RESOURCES

So we have reached the end of this mini journey. If all worked well you should now have a nice little Raspberry Pi media center running OpenELEC setup. So where do you go from here. There many options:

1. You could be completely satisfied as is, in which you move ahead to adding your libraries and enjoying your media center.
2. You may want to purchase additional accessories (eg. [IR remote](#)) to conveniently control your media center.
3. You could customize your setup visually.
4. And finally, if you are daring enough, you could improve the performance of your Raspberry Pi setup and overclock it to squeeze the best out every muscle in your media center.

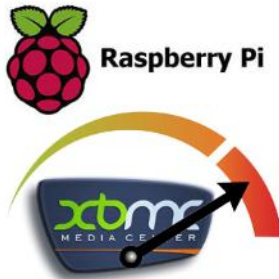
Whatever step you take from here, we have got you covered. Below are links to some additional resources to let you continue your journey.



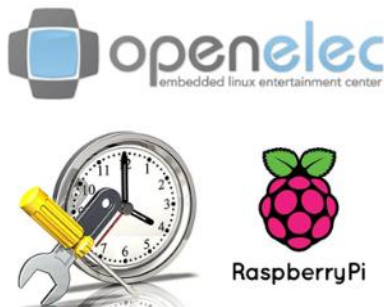
**A simple yet awesome IR
Raspberry Pi remote control for
\$5**



5 Best XBMC skins for Raspberry Pi



10 Tweaks to improve XBMC performance on Raspberry Pi



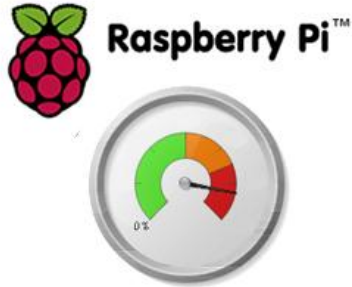
How to fix OpenELEC incorrect time on Raspberry Pi?



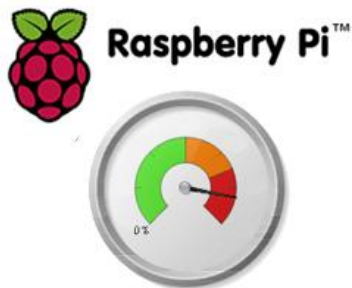
How to SSH into Raspberry Pi for remote administration?



Enable and configure OpenELEC Samba share on Raspberry Pi



What you need to know about overclocking Raspberry Pi



How to overclock Raspberry Pi running OpenELEC?

CHAPTER 7: CLOSING REMARKS

I am sure you will agree with us that this is a pretty simple and straight forward guide to “help you get started”. This is my no means an exhaustive guide and if we fell short in delivering what you expected out of this guide we apologize and we request that you visit our website www.htpcbeginner.com for more advanced content.

Once again we thank you for support. If you would like to be up-to-date on what’s happening in the HTPC and Home Server world, we invite you to click the links below and follow us.

