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# FREEDOM BOX



**NOISELESS** - This design allows cooling the liquid with radiators assembled outside, making the unit completely silent.



**BULLETPROFF**- Everything you need to know to become energy independent, hundreds of pages of, step-by-step, how to instructions and resources.



**FRIENDLY**- This is a green source of energy, and it is also firendly with your power bills.

## Photos, Plans, Illustrations

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## CHAPTER 1: WARNING

I will start this guide with a warning, to make sure that you understand that this project is not child play and to make sure that you will take all the precautions for building this project safely.



1. Using this cooling technique will void your Bitmain warranty.
2. To get similar temperatures that I show when testing this cooling system your environment temperature needs to be between 25 and 29 degree Celsius and have the radiator fans working. Above that, the system might work but you will see different temperatures.
3. You are fully responsible of the way you apply what I show inside this video guides. In case your boards will fail we cannot be held responsible. I would suggest starting your tests with one board then add the rests.
4. You must clean the radiator with water then with distilled water before using oil. I show the entire process of cleaning the system before adding the oil which will be used in production.
5. When handling the power tools, use the safety gear or hire specialized personnel to carry the build process for you in case if you are not qualified.

## CHAPTER 2: INTRODUCTION

- **WATERCOOLING** - Water cooling is a method of heat removal from components and industrial equipment. As opposed to air cooling, water is used as the heat conductor. Water cooling is commonly used for cooling automobile internal combustion engines and large industrial facilities such as steam electric power plants, hydroelectric generators, petroleum refineries, and chemical plants. Other uses include cooling the barrels of machine guns, cooling of lubricant oil in pumps; for cooling purposes in heat exchangers; cooling products from tanks or columns, and recently, cooling of various major components inside high-end personal computers. The main mechanism for water cooling is convective heat transfer.

For experienced builders, a DIY water cooling kit with individual parts offers more flexibility. A typical DIY water cooling kit consists of a radiator, hoses, pump, water block, reservoir and fan. When these pieces are installed and working together they are called a loop and are very similar to what you would find under the hood of your car.

One of the reasons builders choose to install water cooling the harder way is because they can customize every piece for their choice. I've seen it all, from the very basic to the most insane. But if you're going to install an awesome-looking florescent liquid and a black light, keep in mind you'll need to make sure all the parts are compatible.

No matter which type of water cooling kit you decide to install, it's important you take your time and configure it outside of your hardware. This way you'll be able to spot and repair leaks without having water damage your hardware. You should also check all the hoses for kinks and bubbles (this is where that florescent liquid comes in handy).

Upgrading your hardware to water cooling is fun as long as you're careful. It's also a perfect time to install a water cooling kit because there have never been so many options available. Take your time and research your options before you make the switch and enjoy one of the coolest parts about your hardware.

- **CRYPTOCURRENCY MINING** - Unless you've been living under a rock for the past few years, you've probably heard someone say they're into bitcoin mining or they know someone who mines bitcoins. Perhaps you've come across a news story or an article on the web which talks about these modern day 'miners'. Do you ever wonder what mining is and why so many people have suddenly started doing it? Let us take a closer look at this and try to understand what is mining as well as how to mine bitcoins:

**What is mining?** Mining in the simplest of terms is the process of generating bitcoins. Before we get into what is mining and how to mine bitcoins, here's why it is called mining: Mines in real life exist for resources which lie beneath the surface of the earth. Let us take gold for example. Gold is a depletable resource and requires energy and manpower to be mined out. Consider a similar analogy for bitcoins too.

Bitcoins are a limited resource. There exist only a total of 21 Million bitcoins out of which over 16 Million have been mined. Mining requires energy and manpower. Energy here is the electric energy as well as the computational force which solves complex algorithms. It requires manpower too - which is why miners tend to mine in pools. Like you store your gold in your bank locker, you store bitcoins in a digital wallet. Fun fact, bitcoin is often referred to as 'digital gold'.

**What's the Catch?** In the past when Bitcoins were new, you would be able to mine Bitcoins using your regular PCs. However, as more and more users started joining the mining process, the difficulty increased. When Bitcoin was created, the developer known as Satoshi Nakamoto knew that soon a large number of people would jump in and begin mining. True to his thought that has happened. Hence, he designed the framework in such a manner that it becomes increasingly harder to mine for bitcoins. Since the number of

bitcoins is limited, had the difficulty not been progressively harder, all of them would have been mined by now and the coins would have been divided unequally.

Let us now get into the details of how to mine bitcoins:

**How to Mine Bitcoins?** To mine bitcoins, you need to get various things set up:

1. The hardware aspect of it (Bitcoin Mining Hardware)
2. The software aspect of it (Bitcoin Mining Software)
3. The manpower aspect of it (Bitcoin Pools)
4. The equivalent of a bank locker (Bitcoin Wallets)

Let us take a detailed look at each of these. Putting them all together will give you a good idea on how to mine bitcoins.

**Bitcoin Mining Hardware** Over the years, the face of the bitcoin mining techniques has been changing at a rapid pace. When it all began in 2009, you could have mined bitcoins from your regular garden variety desktop PC. However, things began to change as more and more people started to jump in. Gone was the era of CPU based mining and in came the GPU based Mining. Today it would take you about 100 years to mine one bitcoin using a PC.

A number of miners realized that it was possible to mine for bitcoins using graphic cards used for gaming. They migrated to GPU based mining rigs. However they consumed a lot of power. While they were 50 to 100 times faster in terms of mining, they were not efficient considering the energy efficiency. In came Field Programmable Gate Arrays (FPGA) which were highly energy efficient though they didn't get as big a jump in terms of mining speeds as we got from CPUs to GPUs.

However, the latest trend in the mining technology is of using ASICs. An ASIC is an Application Specific Integrated Circuit - which is a chip dedicated to the cause of mining bitcoins and cannot be used for anything else. It offers a massive improvement over the mining speeds and a drastic reduction in the energy consumed.

**Bitcoin Wallets** After you select the hardware that you would use to mine bitcoins, you need to select a bitcoin wallet - which is where you would store bitcoins at. As explained above, if Bitcoin is the real world equivalent of gold, a bitcoin wallet is the equivalent of the locker where you would store your gold at.

There are a number of bitcoin wallets which users can choose from. After selecting a bitcoin wallet, you would get a wallet address which is basically a series of numbers and letters. Wallets give you a public bitcoin address which you would send to others who want to send you Bitcoins and you would get a private key which is basically the password to your bitcoin wallet.



**Mining Pools** After you have decided on which bitcoin mining rig you are going to buy and which bitcoin wallet you are going to use, you should consider joining pools next. Basically, the concept of a Bitcoin Mining Pool is that an average miner has a limited computing power at his disposal. However, if a number of miners get together and use their combined computing power, they could mine at a faster pace. A block of bitcoin rewards 12.5 bitcoins which are then distributed among the pool depending on each user's contribution. Each pool has its own rules and regulations as well as limits and fees. Users are advised to be well aware of what they are heading into before they finally decide a pool to join.

Pools allow you to sign up and register all your mining units so that they can track the progress of each of them and reward you with bitcoins based on your contribution to the pool. Your bitcoins go to your mining wallet via the public address which we mentioned earlier. You will be asked for this address when you sign up for the pool.

**Bitcoin Mining Software** Once you have your hardware, wallet and pool in place - you would need to decide a bitcoin mining software. While some pools have their own bitcoin mining software, sometimes it is up to the miner's choice. There are many options available and miners have to make choice based on the kind of rig that they are using. It also varies if you are using a PC or a Mac.





**How to Start Mining?** Now to answer the biggest question - how to mine bitcoins. We assume you have your hardware, software, wallet and pool in place. The moment is now here!






1. Plug your mining rig on to the power source.
2. Connect your mining rig to your PC
3. Start the mining software
4. Enter your pool, your username and your password

This will begin the mining process. You are now mining for bitcoins. After everything is said and done, based on how your pool sends payouts, you will be rewarded with bitcoins in your bitcoin wallet. This is how you mine for bitcoins!






- **ANTMINER** - An Antminer refers to a brand name for ASIC hardware. Therefore, an Antminer is a Bitcoin mining hardware. Several Antminers exist in the market starting with the ANTMINER S1 with a speed of 180GH/s to the latest Antminer S9 with a speed of 13.5 TH/S.






### CHAPTER 3: LIST OF TOOLS



Nr. Crt.	Description	Images
1	Metal Cut-off Saw	
2	Grinder	
3	Welding Machine	
4	Elbow	

5	Tape Measure	
6	Hammer	
7	Pencil	
8	Drill	
9	Threading Tool	





10	Wrench	
11	Pipe Wrench Plier	
12	Screwdriver Set	
13	Cutter	
14	Nose Pliers	

15	PVC Cutter	
16	PVC Pipe Welding Machine	
17	Vise	
18	Glue Gun	
19	Soldering Gun	




20	Small Side Cutters (snips)	
21	Hot Air Station	

## CHAPTER 4: MASTER LIST OF MATERIALS




To complete this project you will need these materials:





Nr. Crt.	Description	Qty/Unit	Vendor	Images
1	Antminer	1	Bitmain <a href="#">LINK</a>	
2	Car Radiator with Fans	1	eBay	

3	Toolbox	1	eBay <a href="#">LINK</a>	
4	Water Pump	1	eBay	
5	Junction Box, Electric Enclosure	1	eBay <a href="#">LINK</a>	
6	Iron Rectangular Bars 40mm x 20mm x 820mm (1 5/8" x 3/4" x 32 1/4")	2	-	





7	<p>Iron Rectangular Bars  40mm x 20mm x 800mm  (1 <sup>5</sup>/<sub>8</sub>" x <sup>3</sup>/<sub>4</sub>" x 32 <sup>1</sup>/<sub>2</sub>" )</p>	2	-	
8	<p>Iron Rectangular Bars  40mm x 20mm x 800mm  (1 <sup>5</sup>/<sub>8</sub>" x <sup>3</sup>/<sub>4</sub>" x 19 <sup>3</sup>/<sub>4</sub>" )</p>	2	-	
9	<p>Iron Rectangular Bars  40mm x 20mm x 800mm  (1 <sup>5</sup>/<sub>8</sub>" x <sup>3</sup>/<sub>4</sub>" x 11" )</p>	2	-	



10	Ball Valve Female to Female 1" - 25 mm	4	eBay <a href="#">LINK</a>	
11	Male Thread Hose Barb Tubing Fitting Coupler Connector Adapter 1" – 25 mm	4	eBay <a href="#">LINK</a>	
12	Male Thread Brass Pipe Reducer Connector Coupler 1" – 25 mm	2	eBay <a href="#">LINK</a>	

13	Brass hex Lock Nuts 1" – 25 mm	2	eBay <a href="#">LINK</a>	
14	PVC Pipe ø1" – ø25 mm	2	eBay <a href="#">LINK</a>	
15	PVC Cap ø1" – ø25 mm	2	eBay <a href="#">LINK</a>	
16	PVC T Pipe ø1" – ø25 mm	2	eBay <a href="#">LINK</a>	

17	Brass Tee Pipe Fitting	1	eBay <a href="#">LINK</a>	
18	Hose Clamps	10	eBay <a href="#">LINK</a>	
19	NE555 Squarewave Generator	1	banggood <a href="#">LINK</a>	
20	Prototype PCB Board	1	eBay <a href="#">LINK</a>	

21	Car Charger	1	eBay <a href="#">LINK</a>	
22	On-Off Switch	2	eBay <a href="#">LINK</a>	
23	Power Supply 12V with 15 Amp's	1	eBay <a href="#">LINK</a>	
24	Mineral Oil MOL WO M 15 10L	25 l	Europe <a href="#">LINK</a> USA <a href="#">LINK</a>	

25	Transformer Oil	25 l	eBay <a href="#">LINK</a>	
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## CHAPTER 5: CONTROL BOARD DIAGRAM

