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Tools

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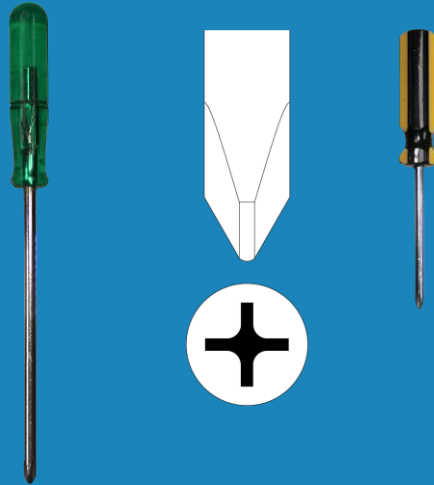
In this video from ITFreeTraining, I will have a look at some of the tools that you will need when you start working with computers. This will help you decide which tools you will buy depending on your budget.

Phillips Head Screwdriver
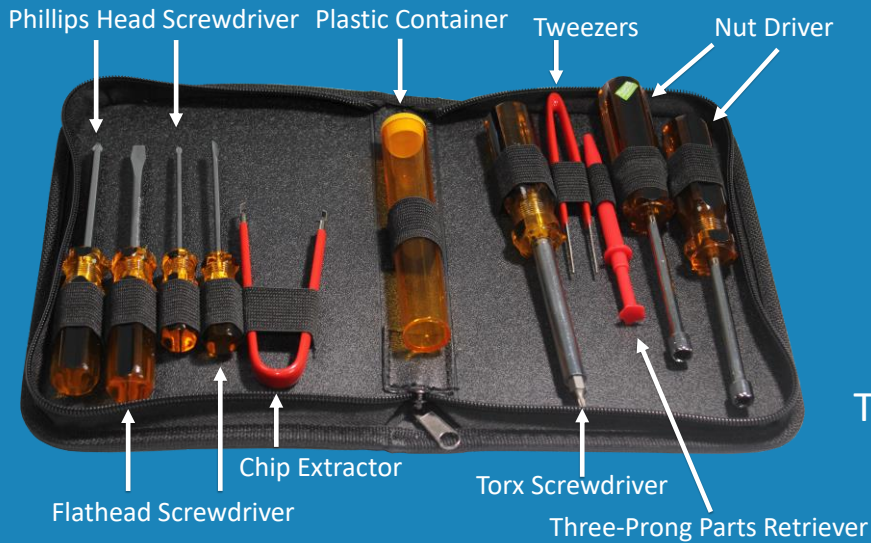
- Most widely used screwdriver to date

0:11 The first tool and the most important tool for you to have is a Phillips head screwdriver. The Phillips head screwdriver, named after its inventor, is the most widely used screwdriver. This screwdriver is primarily used in computers as well as other electronic equipment. This type of screwdriver is popular because the design has a self-centering property. Self-centering essentially means that when you use the screw driver to screw in a screw, the screw will tend to go in straight down.

If I have a close up look at the screw and the tip of the screwdriver, you will notice that the screw has a crosshead design. This is what gives it the self- centering property. When you screw a Phillips head screw in, the force will be balanced out, thus the screw will go in straight downwards and not off to the side. This helps prevent screw holes being damaged when putting in or removing screws. You can see why it became so popular.

If you are considering expanding your tools, I would suggest buying a second Phillips head screwdriver of a different size. You will find that computer components have screws of different sizes, so having a different sized screwdriver really comes in handy.

There are also tool kits you can buy. I will start by looking at a basic tool kit.

11 Piece PC Toolkit

Phillips Head Screwdriver   Plastic Container   Tweezers   Nut Driver

Torx Screwdriver bit

Flathead Screwdriver   Chip Extractor   Torx Screwdriver   Three-Prong Parts Retriever

1:31 This is a basic 11-piece tool kit. Named because there are 11 items in the tool kit. In this tool kit there are four screwdrivers. Two Phillips head screwdrivers and two flathead screwdrivers. You will find that you will use the Phillips head screwdrivers 99% of the time. The other tools you will use rarely if at all.

The next tool is a Chip Extractor. The chips used in electronics are known as integrated circuits or IC's. In some cases, the IC may be plugged into a socket. You can see this board has three IC connectors with two chips plugged in. To remove one, take the chip extractor, close it over the ends of the chip and pull directly upwards. You want to pull upwards so the legs of the chip do not get bent.

In the old days of computing, it was not uncommon to have a few removable ICs. It was common for video cards to be able to have the memory expanded by plugging in additional memory chips. Nowadays, video card memory is generally not upgradable. Memory is found in memory modules rather than single chips. You may see an IC connector on a network card to install a boot ROM, but they are pretty rare nowadays.

It is pretty unlikely that you will need an IC extractor today. If you find that you don't have one and need one, you can always use a flathead screwdriver. If you do it this way, lift one side at a time, but do your best to not lift one side too high, as this will bend the pins on the chip if the chip is lifted out unevenly.

In the middle of the kit is a plastic cylinder. This is useful for storing parts like screws for later use.

Next to this is a Torx screwdriver. A Torx screwdriver has a different head to a Phillips screwdriver. Some computers will use these. Sometimes a technician will replace the existing screws with Torx screws for security reasons. The idea behind this is that most people don't have a Torx screwdriver and thus could not remove the screws from the computer. Torx screwdrivers are easy to acquire, but the idea behind this is that the average person does not have one.

The next part in the tool kit is tweezers. Tweezers are useful for removing small parts like screws, but also for unplugging and plugging in ribbon cables which are small and delicate to handle.

The next item is the three-prong part retriever. Like the name suggests, press down at the top and three prongs come out. This tool is useful for removing items like screws from inside a computer.

The last two tools in your tool kit are two nut drivers. One of these nut drivers can be used to screw in the standoffs that are used to hold in a motherboard in the computer. In computing you will rarely come across nuts. In most cases, the Phillips head screwdriver is the number one tool that you will use.

If you are willing to spend a little more money, you can get a larger tool kit.

58 Piece Toolkit

Three-Prong Parts Retriever
Chip Extractor
Black Insulation Tape
Small Screwdrivers
Ratchet Shaft
Reversible Ratchet Handle
Wire Stripper, Crimper
Needle Nose Pliers
Diagonal Cutter Pliers

Small Brush
Pen Knife
Cable Ties
Allen Keys Set
Anti-Static Wrist Band
Assorted Screw Bits
Wire Stripper
Flashlight
Spare Parts Container

4:42 The next tool kit that I will look at is the 58-piece tool kit. As you can see, this tool kit contains a lot more items in it than the 11-piece tool kit. At the top, is the three-prong part retriever and the chip extractor. I covered these in the previous tool kit, so I won't worry about going over them again.

Below these are a set of small screwdrivers. In most cases you will use the large screwdrivers, but sometimes you will come across a computer component that uses small screws.

There is no dedicated larger screwdriver in this tool kit, but it does have a ratchet screwdriver. To use it, attached the ratchet shaft to the handle. The ratchet screwdriver has a switch on the handle which will allow it to turn clockwise, counter-clockwise or to prevent the screwdriver from turning.

This particular tool kit has three sets of assorted screw bits, 22 bits in total. Each of these can be used in our rachet screwdriver. In this particular case, the type of bit is printed so you know which is which. However, this also means you need to be careful to put them back in the same place.

It is just a matter of selecting the bit you want and putting it in the rachet screwdriver. In this case I will select the Phillips head bit, as that is the one that will get used the most.

The next item in the tool kit is a paint brush. When you are cleaning computers, the paint brush comes in handy to remove dust from those hard to reach places.

The next item is a pen knife. Sometimes components don't want to fit in place and you may need to remove some plastic to make them fit. This does not happen very often and should be considered a last resort.

Next are cable ties. Always useful for securing your cabling and making everything look neat.

Next there are Allen keys. These are generally not used in computer equipment, but you may come across them if you are trying to fix a computer that is inside a manufacturing device or medical instrument.

The next item is an anti-static strap. This is attached to your wrist to remove static electricity from you. I won't worry about going through this one because we went through it in a previous video.

That is half of the tool kit. The second half contains a wire stripper and crimper. The wire stripper as the name suggests strips the outer plastic casing from a wire. You can see the holes are marked for different sized wires. Put the wire in, close it and pull the wire to remove the plastic outer case from the wire.

At the front is the crimping part of this tool. Essentially crimping is the process of squeezing plastic or a connector onto a wire. This can be done using the holes or the front part of the tool.

The next tool is needle nose pliers. These are generally good for getting items like screws out of hard to reach places. In the center is a part of cutting wires.

The next tool is diagonal cutter pliers. This works essentially the same as the needle nose pliers, but only has one part for cutting.

You will find that some tools will have similar functions. The next tool is another wire stripper. The screw in the middle can be moved to adjust for the length of the wire and then the tool is used to remove the outer plastic casing from the wire.

The flashlight is pretty self-explanatory. The one here is small and not very bright. I would buy a better one. Useful when you are trying to read things like model and serial numbers inside a computer. Nowadays, mobile telephones have lights and cameras installed. When I want to read a serial number in a computer, I usually use my mobile telephone to take a picture and read it.

The last item in the tool kit is a container for putting items like screws in. When you start working with computers, you will start to accumulate a lot of screws. It is a good idea to keep them organized right from the start.

Now that we have looked at the 58-piece tool kit, I will next look at the 145-piece tool kit.

145 Piece Toolkit

8:43 Did I mention that that the most important tool you can have is a Phillips head screwdriver? You can see the 145-piece tool kit looks like it has a lot more items than the 45-piece tool kit. However, what I will do is take out everything that is included in this tool kit that is not in the 45-piece tool kit or is different. This essentially amounts to ten different items. So, there is not really that much difference between the tool kits.

The first item, more bits for the rachet screwdriver. All the other bits are included plus these. So, you can see that most of the extra pieces in the tool kit are just these extra bits.

The next item is a set of tweezers, a useful item if you want to retrieve an item like a screw from a difficult to get to place. Remember they are made of metal, so don't touch anything that has electricity in it or the potential to hold an electrical charge.

Next there is an electronic voltage tester screwdriver. Essentially there is a light inside the screwdriver. The circuit is completed by putting your finger on the end of the screw driver. I personally don't like myself being used as part of a circuit, so I would use another device like a multimeter to test circuits. I will look at a multimeter later in the video.

The next item is a small hammer. In IT you are never going to use a hammer unless you want to break something. The only time I have used a hammer is to destroy a hard disk. Not a good way to do it and not very effective. I would personally use a data destruction company to destroy the hard disk correctly or use specialized equipment to do it.

The next item is a large flashlight. Much better than the previous flashlight included in the small tool kit, but you can always buy your own.

The next item is a mini vacuum cleaner. Useful if you want to remove dust from inside a computer. Not very powerful. Later in the video I will look at other ways of getting the same result.

The next item is solder. This is used with a soldering iron. This allows electronic components to be connected to printed circuit boards.

So of course, the next item is the soldering iron. Essentially the soldiering iron heats up, melting any solder on an existing circuit or placed on it. Melting the solder makes a connection for the circuit.

If you make a mistake with your soldering, the tool kit including some solder remover. Use this to remove solder. Unless you are really into electronics, the average and even above average IT technician will never use a soldering iron.

The last item is some connectors. If you want to make your own cables these are useful. Making your own cables is useful when you want to go above and beyond with cable management.

You can start to see that the larger the tool kit, the more items it may have, but there are probably items that you are rarely if ever going to use. Hopefully there are not too many tools in there making it hard to find your Phillips head screwdriver!

Compressed Air Can

11:50 The next tool I will look at is the compressed air can. The compressed air can, as the name suggests, is a can full of compressed air. You can see that compressed air is useful for removing dust from items like fans. You won't damage the fan by using the air to spin it; actually it's not a bad idea to spin the fan with the compressed air to make sure it is spinning correctly.

If you have the money, let's look at a better solution.

Canless Air System

- 300km/h and environmentally friendly

12:15 If you have the money you can look at buying a canless air system. A canless air system, as the name suggests, does not utilize a can of compressed air connected to it. It, instead, draws air around it and blasts it out at a high rate. Canless air systems can generate an air blast of over 300 km/h and are environmentally friendly.

As you can see, you can easily blast the dust out of the computer using the canless air system. This is much more effective than the compressed air can, however it does cost a lot more to buy. If you maintain a lot of computers it may be worth buying, otherwise the compressed air can is the cheapest option and will generally be sold for only a few dollars.

Air Compressor
- Plugged into power to provide compressed air
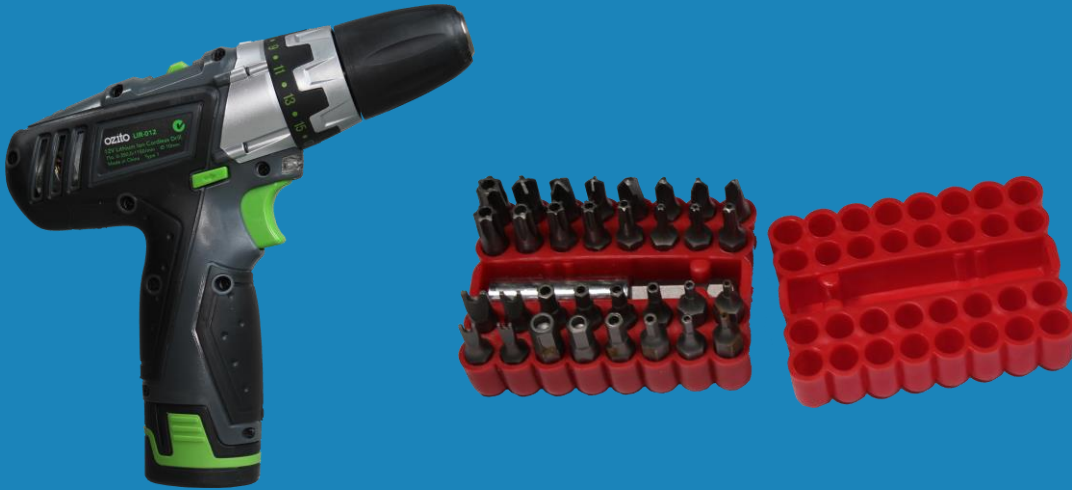- Found in factories/High-volume repair areas

13:00 Some places may have an air compressor. These are plugged into the power supply and provide compressed air. Essentially, they contain an air tank. When the pressure in the air tank gets too low a motor starts up to fill up the air tank again. So, these devices can start without notice and run for a little while before stopping.

You generally find these in factories or high-volume repair areas. In some cases, the compressor may be located elsewhere in the building, so when it starts up the noise does not disturb the workers.

Cordless Drill

- Generally found in high-volume areas

13:31 If you find you are using your screwdriver a lot, you may want to consider a cordless drill. These are also generally found in high-volume repair areas where they are putting computers together all day every day.

All you need to do is find the right bit, most likely it will be the Phillips head bit, and put it in the drill. For the general technician it is not really worth getting one of these, but if all you do all day is pull computers apart and put them back together again, it is worth considering.

Multimeter

- Measures voltage and resistance

14:01 The next tool I will look at is the multimeter. A multimeter is used to measure voltage and resistance. The average technician won't have one of these, so you don't need to worry about getting one even though they are very cheap to buy.

If you know which wires carry what voltages in your computer, a multimeter is good for testing it to make sure that the correct voltage is being outputted. You just need to know where to place the red and black test leads and then read the results on the screen. For example, you can test that your power supply is outputting the correct voltage.

I would personally prefer using a multimeter over an electronic voltage tester screwdriver. With the screwdriver you are part of the circuit, but with the multimeter you are not. It is a safer option.

Anti-Static

- Helps prevent anti-static damage to electronics
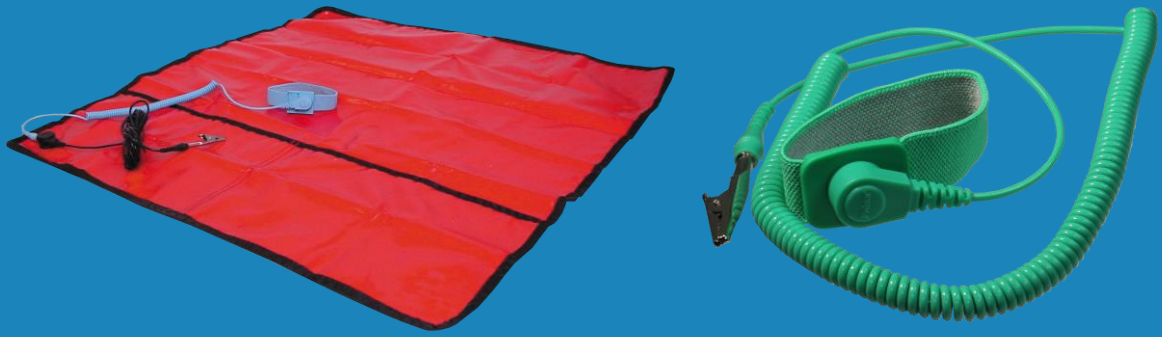
14:48 The next items you should consider are an anti-static mat and anti-static wrist band. These devices help prevent your devices getting damaged by static electricity. I cover these in more detail in previous videos, so I won't worry about going into detail about it here.

If you are working out in the field it is worth purchasing an anti-static mat. You never know where a computer will be. Different areas and environments have more or less static electricity. It is important that while attempting to fix a computer or device, you don't damage it more with static electricity.

Other Tools

- https://www.ifixit.com/
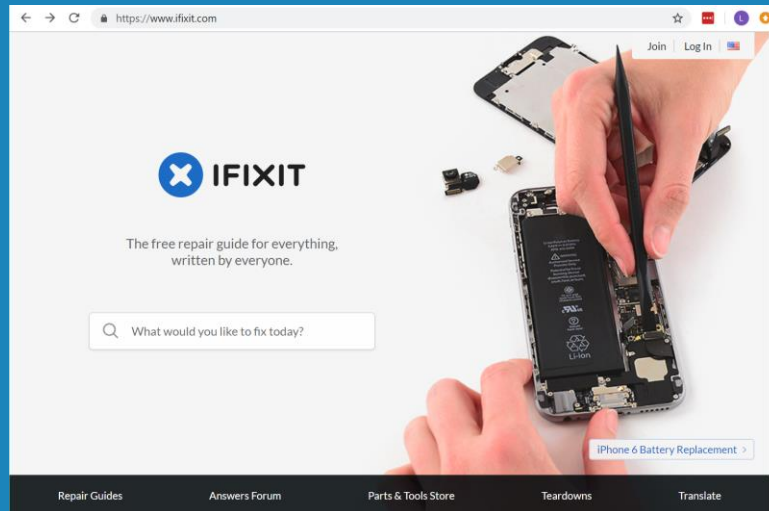
15:23 This covers the basic tools you will need. However, sometimes you may need some specialized tools. For example, if you need to fix a mobile device. Due to the small parts in these devices, they may require special tools in order to repair them.

One site I would recommend to get such parts is iFixit dot com. This site sells a lot of these specialized tools as well as the basic tools. The site also has instructional walkthroughs on how to use these tools. If you have to fix something a standard tool kit won't help you with, it is worth checking this site out.

Basic Kit

2nd Phillips Head Screwdriver

Compressed Air Can

Flat Head Screwdriver

Mobile Device for Camera and Light

Anti-static Mat and Wrist Band

Phillips Head Screwdriver

15:59 To finish this video, I will go through the basic tools that you need as a technician. We have seen that you can spend a lot of money on a big tool kit, but in reality, you only need a few tools to get by. You can always buy the extra tools as and when you need them.

First, I would purchase a Phillips head screwdriver. If I have not mentioned it before, it is the most important item in your tool kit. The next item I would purchase is a second Phillips head screwdriver. Some technicians will also have a magnet in their tool kit to remove screws which fall inside the case. However, personally I just magnetize one of my screwdrivers and use that. Generally, however, you should keep magnets away from computer equipment that is sensitive to magnetic fields like hard disks and tape drives.

The next item I would purchase is a flathead screwdriver. Generally, computers don't use these screws, known as slotted screws, but a flathead screwdriver is often useful when you need to lever something out. For example, if you need to remove a chip from a board. However, be careful not to use too much pressure and break it.

The next item I would consider purchasing is a compressed air can. Although not necessary, a compressed air can is only a few dollars to purchase. It is useful to get dust out and kind of fun to use.

The next device I would suggest is a mobile device like a cell phone or a tablet, mostly because you probably already have one and don't need to buy it. These devices generally have a camera in them which is useful for taking photos of items inside a computer. This is helpful for reading

those difficult to read serial numbers and part numbers.

If your device does not have a flash light, you can always buy a flash light to add to your tool kit. The camera however can be a life saver, saving you having to pull the computer apart in order to read a serial number in a difficult to get to place.

The last item I would consider purchasing is an anti-static mat. Although a lot of people don't use them, they are cheap to purchase and can potentially save an expensive component from being damaged. If you work on a customer site, just having an anti-static wrist band will make you look just that little bit more professional.

That concludes this video from ITFreeTraining on the tools you will come across as an IT technician. If you don't have one, go out and buy yourself a Phillips head screwdriver! Until the next video, I would like to thank you for watching.

References
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"Henry F. Phillips" https://en.wikipedia.org/wiki/Henry_F._Phillips
"CompTIA A+ Certification Tenth Edition" Chapter 1 Pages 15-17