Refurbishing Steps for Success

Hard Drive Wiping

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www.microsoft.com/refurbishedpcs
Why wipe hard drives?

- Responsible refurbishers always wipe or destroy hard drives.
- Drives cannot be wiped through reformatting or repartitioning. It would be similar to tearing the index out of a book. While the chapters would not be visible the information is still there.
- Businesses, governmental agencies and the public are all demanding that their information be destroyed. Many agencies think their information has been wiped, but don’t take it for granted. Wipe it again and be sure.
- If information from a hard drive donated to your facility is released, confidence in donating will be destroyed.
- The drive can be removed first and wiped or wiped while in the computer. The computer must not boot up to the hard drive. Protect donor privacy.
Tools needed

Needle Nose Pliers and a Marker Pen

3 or 4 Drive Wiping Station

Adapters for wiping 2 ½” Drives and SCSI Drives (Winchester)

KVM Switch Box
Use 1 monitor, keyboard & mouse for 8 computer wiping stations

Wipe 16 hard drives at a time by building your own Raid server.
Sort the hard drives

- How big is the hard drive? If it is too small to keep, destroy the drive rather than taking time to wipe it.
- 2 ½” IDE drives or notebook drives. Get an adapter to attach to your IDE ribbon cables or wipe the drive in the laptop. Get a 2 ½” to 3 ½” IDE adapter.
- SCSI drives – Wipe the drive in the computer or have a station set up with a SCSI cable. Get an adapter so you can wipe Winchester drives.
- SATA (serial ATA drives) Some newer computers have SATA options on the motherboards. SATA drives will become more numerous as time goes by.
- Most drives will be 3 ½” IDE drives but be prepared to wipe other popular kinds as well.
- Don’t forget to wipe the hard drives in donated printers.
- You can create a data wiper that wipes 16 different hard drives at one time – IDE – laptop – SCSI – SATA. You just need a motherboard that supports the various options, a power supply with the appropriate power connectors and a sense of adventure in putting it together.
IDE drive jumpers

• Motherboards have two IDE slots.
• Each IDE can handle two IDE devices.
• One IDE ribbon cable is connected to the Primary slot and the other to the Secondary slot on the motherboard.
• Every computer can handle 3 hard drives and a CD drive or 4 hard drives.
• Jumpers should be set on the hard drives and CD drives depending upon the brand of the drive. Some computers will allow for CS (Cable Select) while others will only accept Master and Slave. The Master drive is located the furthest from the motherboard on the IDE cable and the Slave drive is in the middle.
Different brands of hard drives have different jumper settings. Western Digital drives are marked on the circuit board. When wiping a single drive, the jumper is in the “off” position. If wiping two drives on the same IDE cable, one should be set to Master and the other to Slave. The drives may wipe faster as Master/Slave than Cable Select – CS.

This last example is used when wiping Maxtor, Quantum and most other drives.
More hard drive settings

- Another common drive type is IBM or Hitachi.
- If you can’t find the jumper setting on the drive, do a web search such as: “jumper settings drive name”.
- 2 ½” drives can also be set as master/slave for wiping purposes. Look at the face of the drive for jumper settings.
More information on setting jumpers

- Settings depend on the brand of the drive. Look at the drive for the settings.
- The master jumper on most drives goes next to the IDE cable. This drive shows that the slave setting should be left blank. The jumper can go horizontally across the pins to be in the neutral position. If removed the jumper might get lost.
- The red or blue line on the ribbon cable indicates Pin 1. Pin 1 is located nearest the jumpers.
- Use needle nosed pliers or a bent pin (paper clip) to remove the jumpers.
- The wiping process may go more quickly with matching drives.
Wiping software

- A good, free software wiping program that has been around for a long time is [Darik’s Boot and Nuke](https://www.dban.org) or DBAN.
- You can download and create a bootable floppy or CD. DBAN can be used to wipe multiple drives, SCSI and SATA drives as well.
- Older computers work better using the floppy drive rather than the CD drive. Some newer computers don’t have floppy drives and the CD disk would be necessary. Download a free copy of a program that can burn .iso images to CDs or DVDs.
- If DBAN runs slowly, one or more of the drives may be defective.
- Whatever software you select, you should wipe to the recognized standard, the US Department of Defense clearing standard DOD 5220.22-M.
- There are excellent wiping programs such as Blancco but they are fee-based. Your donors may have certain requirements.
Boot to the bios

• Plug in the computer, the keyboard and the monitor and insert the DBAN floppy disk.
• Get into the computer bios…
  – If you don’t know how, try hitting F1, F2, F10 and Del in succession. You may find the function key by watching the screen when the computer is turned on. If all else fails, either remove a stick of Ram or add a stick so that the memory changes and the computer will go to the bios.
• Set the IDE drives to “auto detect”
• Set the boot order so that the floppy drive is first.
• Save the settings and reboot the system.
• If the computer boots to the hard drive, immediately shut it off. Check the cable connections and the power light on the floppy drive. Check the bios to be sure the floppy drive is seen. If necessary replace the floppy drive or cable and try again.
• If the bios doesn’t see the IDE drive, the drive may be bad. Try the drive in another computer after checking the cable and power connections to the drive. Be sure the jumpers are set correctly on the hard drive.
Set up and run the wiping software

- Boot the system with the DBAN disk in the floppy drive.
- The suggested method of wiping is the DOD 3 pass wipe that is the default wipe when using DBAN.
- After booting up type “autonuke” for the wiping process to start up. Once the drive has been completely wiped the message “All drives have been wiped successfully” will appear on the screen.
- If the drive does not wipe completely press F4 for additional suggestions.
- Some drives can be revived by formatting and wiping again.
- If the drive clicks or makes noises, it is bad and should be destroyed. Drives that don’t wipe completely are destroyed.
Wipe multiple drives at a time

- Wiping drives takes time. The computer, monitor, keyboard and mouse take up room and power. One computer can wipe 3 drives with a CD drive or 4 drives using a floppy disk with the wiping software.

- Be sure to set the drives to master-slave or cable select. All of the drives will wipe at the same time. The total time to wipe will be longer than wiping one drive but much faster than wiping each drive separately.

- Larger hard drives can be wiped over night. Over time as the drives get larger it will take longer to wipe them.
Use a KVM switch box

• A KVM Switch Box can be used to save space and energy. When using an 8 port switch, only one monitor, one keyboard and 1 mouse is needed. You can cycle between 8 computers on one desk.

• Each computer can wipe 4 hard drives so the station can handle an optimum of 32 hard drives at a time.

• Use monitor shelves that clamp on the desk to stage the computers at different heights for ease of operation.
Build a 16 to one server

• A server can be built to wipe 16 hard drives at a time. In an empty case install two power supplies and fans. The motherboard needs enough ISA slots for 4 two channel RAID cards. Each RAID card has room for 2 IDE adapters or 4 drives.

By getting extra caddies, the new drives can be prepared and placed in the caddies while the first batch is wiping. It saves space, time and power.

For further instructions visit: www.ComputersForClassrooms.org.
What is inside of a hard drive?

- Any drive that is too small or can’t be wiped completely must be destroyed to protect information on the drive.
- Data is stored as magnetic media on platinum coated disks. The case is made of cast aluminum.
- Any method of destroying the hard drive must make it inoperable and destroy the media on the disks.
- Check out the scrap value of the wiped/destroyed drives.
Methods of destroying drives

- A mallet and a spike driven through the drives is a low-tech method of destruction. The spike must penetrate through all disks. Wear eye goggles and gloves. This is hard work.

- A drill press makes it easier for larger quantities to be destroyed. The user must wear eye goggles. Create a jig to hold the drive for further safely. This method can handle odd sized drives such as big foot drives. Using a tool to sharpen drill bits will save money.
Degaussing hard drives

- Another method is to use a Degausser. A magnetic pulse penetrates through the drive case and erases all magnetic data on the drive. It also makes the drive inoperable as the heads become magnetized. 200 drives per hour can be Degaussed. Some units are portable so donors can have the drives destroyed before leaving their property. Drives can be Degaussed before being returned for warranty replacement.

Each method of hard drive destruction has pros and cons including cost, user safety, and donor requirements. This unit costs around $7,400.00. You may be able to buy used equipment or get special pricing if you are a non profit.
Destroyed drives have a scrap value

- Encourage donors to donate their drives for reuse by giving assurances of your method of wiping.
- Destroy all drives that do not wipe completely.
- Some methods of destruction drill large holes in the drive or bend the drive in half. Whatever method you use think about the scrap value for the drive. Check with your recycler to find out how to give him the drive in the form to get the best price. If the drives are bent in half they may be more difficult to pack and ship for recycling.
- Some donors want to have their drives shredded – the finer the pieces the better. Use whatever method you can afford and that your donors demand.
- Since Flash drives do not contain magnetic data they cannot be destroyed by using Degaussing, they must be smashed or shredded.
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