Refurbishing Steps for Success

Monitors, Printers and Warranty Repairs

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Monitors for reuse

The Topics covered in this Deck include:

Monitors: CRT and LCD
The handling and disposal of monitors
The testing of monitors for reuse:
   Using test patterns
   Adjusting controls
The dangers of removing the monitor case
The problems with a crimped monitor cable
Degaussing the monitor
Burned in screens or scratched screens
Cleaning monitors and screens
Transporting and stacking monitors.

Printers – Ink jet or laser?
Test printers – test page
Common problems
Monitors – CRT and LCD

- The two most common types of monitors are CRT Cathode Ray Tube and LCD Liquid Crystal Display.
- CRT is most common at this time although more LCD monitors are coming. Some LCD monitors require a separate power adapter. The power adapters are specific for each model. Try to keep them with the monitor if possible.
- The first step in working with monitors is the same as working with computers – triaging to sort those to be kept or those to be repaired or recycled.
Initial sorting – ReUse or recycle?

- Monitors contain hazardous materials and need to be handled carefully. CRT monitors contain lead that would be toxic if allowed to get into the ground water supply. If the glass is broken in the CRT monitor, sweep the contents into a sealed container being careful not to breath the dust.
- LCD monitors contain mercury. If broken handle with gloves.
- For the purposes of refurbishing we do not advise removing the plastic case of the CRT monitor. The stored electrical charge in the capacitor can be dangerous. The vacuum tube in the monitor can implode if the glass is cracked and air rushes in. Glass can fly everywhere. Please handle carefully. Another module will cover the proper way to demanufacture monitors.
- Sort out monitors that are beyond testing such as:
  - Scratched screens
  - Burned in Screens
  - Badly discolored or damaged cases
  - Look for bent pins on the video cable
  - Damaged video cables that can’t be repaired
Screen test

This is a good, free test screen that can be downloaded from Computers for Classrooms Tech Tips. It works very well if you have the image set up on another monitor so you can compare. Use the adjustment on the monitor to center the picture and margins, adjust the color and hue and check out problems. Many monitors fail because the screen is too dark. That is an indication that the monitor is failing. Monitors can be hot swapped – no need to turn off the computer when plugging in the video cable.
Comparing screens

It helps to have a good monitor set up to use as a comparison. As the monitors age they often become darker. Note the dark bands crossing through the monitors below. By having the comparison monitor it is easier to see variations in color and brightness. The adjustments on the monitor are used to align the picture and center it on the screen. If the controls cannot correct the image, the monitor should be set aside for recycling.
Handling monitors to be recycled

- What will you do with your rejected monitors?
  - Monitors may be remanufactured or recycled.
  - Before you accept monitors, decide how you will get rid of those that are defective.
- Many refurbishers have recyclers that will take all of their discarded electronics for demanufacturing. Recycling can be profitable – to take electronics apart for their scrap value but that is another topic.
- Decide with your recycler how to handle your discards.
- One method is to cut the power cords to make handling easier. There is a scrap value for the cords and handling monitors is much easier without cords dangling down to trip over.
- Monitors can be palletized for easy delivery to the recycler. See our unit on warehouse operations.
Other monitor issues

- Monitors can appear to have missing colors if the video cable is crimped or bent. Be sure the video cable is straight when testing the monitor.

- Monitors may need to be degaussed. If the monitor has come close to a magnetic field, the colors may become distorted. Many modern monitors have a built-in degaussing function that can be found along with the other adjustment features accessed from the front of the monitor. This is not as common of a problem with modern monitors.

- Some refurbishers have purchased an inexpensive kit to turn the monitor into a television set. There is a market for very low-cost television sets more typically in third-world countries.

- Some businesses repair monitors as many monitors have a defective circuit board. We will not get into the repair of monitors that includes removing the case. Each monitor has a transformer and a powerful capacitor that can contain 35,000 volts of power. Additional training should be received before handling dangerous equipment. This is beyond the scope of this presentation. As noted earlier the vacuum tube is fragile and there is always danger of cracking the glass and having shards of leaded glass flying out at great speed.
Printers – ink jet

• Ink jet printers are often difficult to refurbish. The cost of new printers is often negligible when pricing the cost of the ink alone. Older printers often suffer from having dried ink clogging the heads. The costs of time to soak and clean the heads, replace the ink cartridges and test the computer are often not cost effective. Some higher end ink jet printers such as office all-in-one units that hold higher capacity ink cartridges and can fax, scan and copy may be worth spending the time to repair.

• Another common problem with printers is that the rubber rollers get dry and cause paper feed problems. Try a product called Rubber Renew.

• The web is a wonderful resource. You can download information from the manufacturer’s web site, find others that have solved a similar problem with the same model printer and find kits available for purchase if the printer is worth it.
Laser printer

- Laser printers are more popular as the cost of the toner is much less than the cost of inks.
- Plug in the laser printer and try to print a test page. If you look up the model on the Internet you can find the keys to press to get the diagnostics on the printer. Generally, you just press the main button before turning on the printer and holding it down until you see a blinking light. You will be able to find the total number of pages that have been printed as well as other important information about the age and wear and tear the printer has sustained as well as the remaining amount of remaining toner and drum life.
- Many of the older laser printers are real work horses and can have a very long life. The cartridges in the older printers often hold more toner and are more economical to run.

Look for jet direct network cards as they are easily removed and transferred to another similar laser printer. Next to the jet direct card may be a hard drive. Be certain to remove the hard drive and wipe it as a security measure.

The jet direct card may need to be reset. Generally, this is done by doing a “cold boot” of the printer that changes back to the default settings when the printer was new. You can follow the menu on the printer or browse the web for the printer manual for directions.

Laser printers may also have feed problems similar to ink jet printers. You can try Rubber Renew on the rollers or look online for a kit to solve the problem.
Save the USB printer cables

- Most printers have a USB printer cable that is donated with it. The cables often sell for $10.00 to $15.00 dollars when new. They can easily be reused.
- Refurbishing printers is a topic beyond this presentation. Many printers are usable with cleaning and possibly replacing the toner cartridges and the drum. If the print is blurred during the initial test the problem may be the toner cartridge. Some donors have purchased used cartridges that may not be of the best quality. Some problems disappear after using full, good quality cartridges.
- It is a good idea to check out the make and model on the Internet to see if other owners have had a good experience with a particular model or if it the printer is known to have problems.
Computers – warranty repairs

• Most Community MAR refurbishers offer a warranty on hardware and installed software.
• We will discuss the steps to take with the:
  ▪ diagnosis of the problem
  ▪ options for repair
  ▪ training to prevent repeated errors

• If the system has recently been given to the client and the keyboard isn’t working, the most likely problem is that the client has plugged in the keyboard and the mouse into the wrong ps/2 connections. We tell them they must first turn off the computer and then swap the keyboard and mouse connections before rebooting. A few extra minutes of explanation when giving out the systems can save time in the future.
Diagnosis of the problem

- Ask the client what is wrong. Why are they needing help? Have they done something different recently such as allowing a friend to use the computer? Have they tried to load a new program? Did they delete any files? They will often give you a lead that may lead you to check in a certain direction.
- Make certain the computer is plugged in properly. When the computer is first installed or moved, the keyboard and mouse may be plugged in the wrong connector. If there is more than one video adapter, the video may be attached to the disabled adapter.
- Check to see if the computer has power. Does it boot up?
- Check the bios. Sometimes children or adventurous adults will change the bios settings.
- Are the time and date settings correct? An incorrect time and date may indicate a bad on-board battery.
- Can you boot to the operating system?
- If you discover problems you may be able to use the System Restore feature to recover the Original Install restore point.
- If the bios doesn’t allow you to correct the date or if the computer does not boot to the operating system you may want to boot with a “live CD” in the CD drive. An excellent tool that you can create is Bart’s miniPE. Use a search engine to download the instructions of “how to” create the CD or DVD. This can be a great tool for the diagnostics and repair of systems unable to boot normally.
Bart’s miniPE

• Mini PE is loaded into the memory of the computer and allows you to access the computer. Correct the time and date if necessary (after testing the onboard battery and replacing it if needed).
• Still in mini PE, update the anti-virus program and run it to see if viruses have caused the problems.
• If the computer has not been infected or if the repairs haven’t worked, discuss the available solutions with the client. If the computer can be booted but the operating system is not working correctly, the OS will need to be reinstalled and all of the documents and photos may be lost.
• If the operating system will need to be reinstalled, does the client have important documents or photographs on the computer?
  ▪ (1) Bart’s mini PE can transfer important files to an external drive to be reloaded later.
  ▪ (2) Another option is to run the anti-virus on the drive and keep it as a secondary drive in the computer. You may want to charge the client for an extra drive where you will install the operating system and programs. If you use the cloning procedures discussed in loading software, this should not take long.
  ▪ (3) You may want to offer the client the option to upgrade to another, newer, already set-up computer for a small fee so they won’t have to wait for the repairs.
• If the hard drive is physically damaged there may be no options other than to replace it.
Problems with adapters

- **Video** – no picture – make sure there isn’t an extra video card installed and that you are plugged into the wrong adapter. Try installing another tested video card. Check the memory as a memory problem can cause a video conflict.

- Go to the device manager by right-clicking on My Computer and going to Properties - Hardware – Device Manager. See if there are any yellow flags on the hardware indicating that the device is not working properly or needs new drivers. Make repairs or disable devices that are not needed. Click on the + to expand the list.

- **Sound** – make sure the external speakers are plugged into the correct audio out jack (usually green color) or that the audio isn’t muted in the software. Check to be sure there is an audio cable between the CD drive and audio cards and the DVD drive and the audio card.

- **Ethernet** – Check the bios to be sure that the network is enabled. Do you see the lights flashing on the back of the adapter indicating that it is connected to your network? If you don’t see flashing lights, or yellow flags in the Device Manager, replace the card if you are sure your network is up.
Problems with CD and DVD drives

- CD and DVD drives – Use test media to check out the drives. Do the drives show up in My Computer? Can you press the eject button and have the disk drive open? If the drive won’t open, use a straightened paper clip and insert it into the tiny opening on the front of the drive. It may have a jammed CD or something else stuck inside. If the tray doesn’t open smoothly, replace the drive. Be sure to use the correct screws when working with CD and DVD drives. They don’t use the same size as hard drives and the case. If you use the larger threaded screws, you can damage the drive.
- If the drives don’t show up in My Computers, either the power cable may not be connected, the IDE cable may not be attached properly or the drive may be bad. You can test the drive in another computer.
- Keep a Read/Write disk to test Read/Write drives. Keep a video on hand to test DVD players.
- Check the jumpers on the drives. Master/slave settings must be configured properly on the IDE cables. The IDE ribbon cables do fail from time to time. Don’t throw out a drive when it may be a problem with the cable.
Software problems

- First, update and run the anti-virus program. Many problems are caused by disabling or not using anti-virus programs. If the problems can be repaired, discuss with the client the benefits of updating the definitions at least weekly and giving the computer a full scan on a regular basis.
- Pop-Ups and unwanted processes. Go to Settings – Control Panel – Add/Remove Programs and look at the list of installed programs. With experience you see will programs that are not on the original list of installed programs. Discuss with the client if they need the added programs and uninstall them if you can with the client’s permission.
- Discuss good Internet browsing techniques with the client. Certain web sites or “free” screen savers can introduce viruses. Don’t open attachments or executable programs attached to email for instance. Use this time to instruct the client as to best practices so that won’t need to come back.
- If the computer is running very slowly, programs may be running in the back-ground. Press Ctrl-Alt-Del keys at the same time and start the Task Manager. Find out what Applications are running. Is something running that shouldn’t be? Also check out Processes and see what is running that is taking up the processor’s resources.
- Generally, we don’t want to spend a lot of time on repairs. We prefer to back-up the client’s documents and re-load the drive using cloning or sysprep.
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