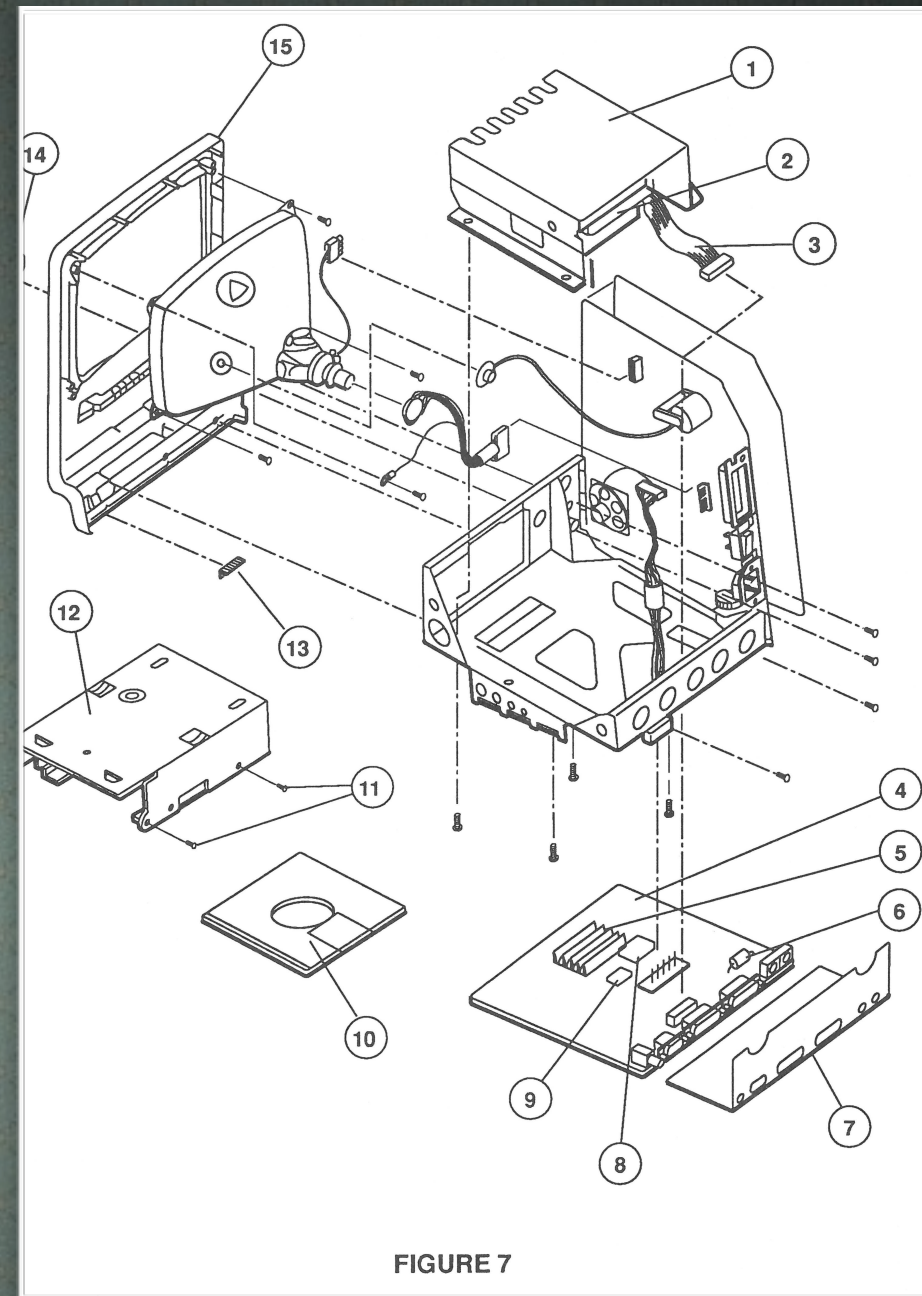
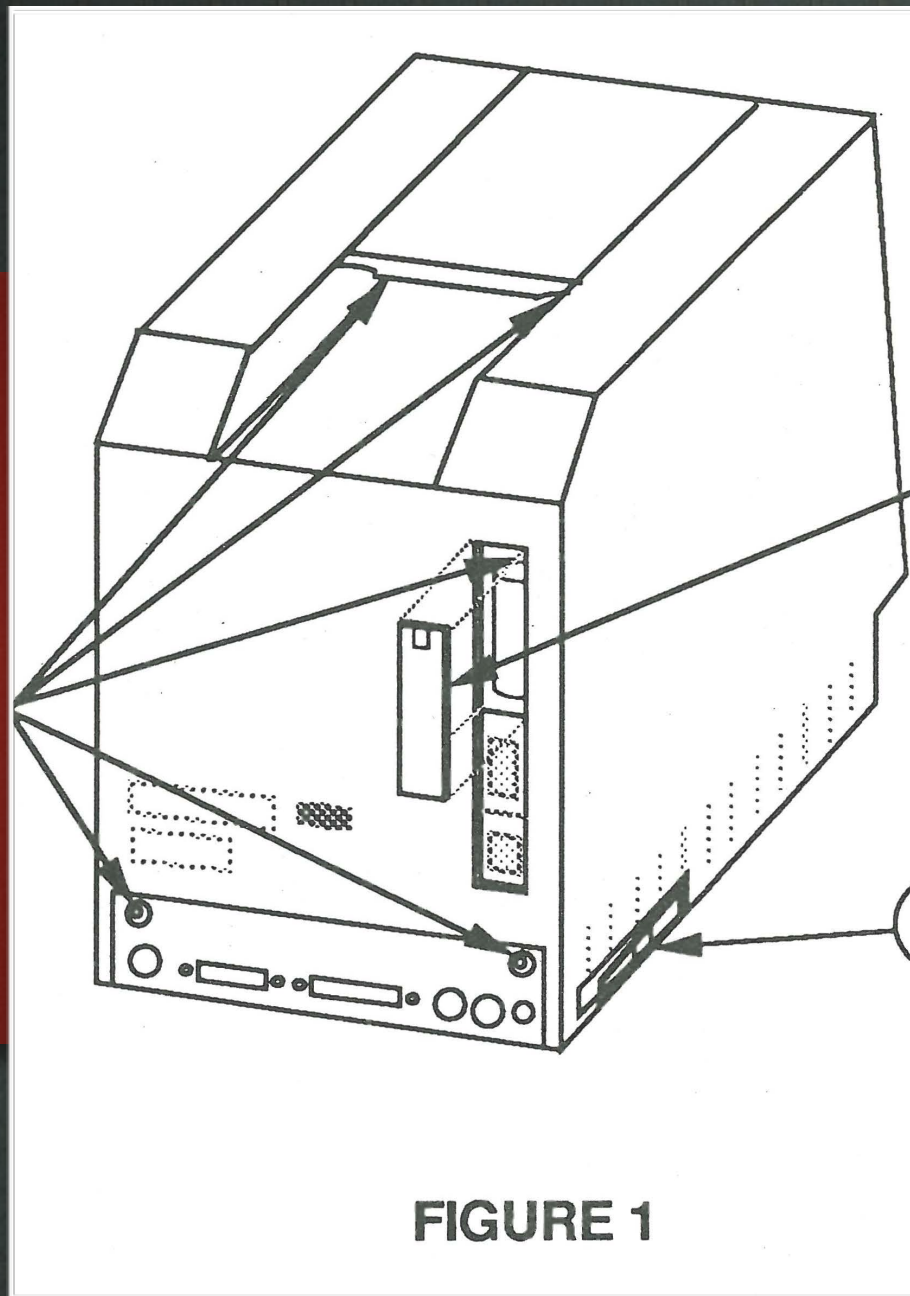


Troubleshooting Hardware, Software & Network Problems

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(For the Mac, of course)

Session Overview

- ❖ Diagnosis and Troubleshooting Mindset
- ❖ Critical Soft Skills
- ❖ Best Practice Methodologies
- ❖ Troubleshooting Tools
- ❖ Q & A

Diagnosis

- ❖ Listen to all of your senses
- ❖ Ask lots of questions
- ❖ Gather information with tools, knowledge, and 'feel'



Troubleshooting Mindset

- ❖ Work with a calm mind
- ❖ Be methodical
- ❖ Avoid overlooking causes by slowing down
- ❖ Look to fix the root causes, not superficial symptoms
- ❖ Look for multiple causes and 'perfect storm' scenarios



Soft Skills - Critical

- ❖ Listen! Let the user tell you, in their words, what they have been experiencing - It's ALWAYS of great value!
- ❖ Speak so that the user understands what you are saying
- ❖ Boasting or condescension stops the flow of clues
- ❖ Remember the principle of Occam's Razor

Best Practices: Basics

- ❖ Can you reproduce the error, or can the user reproduce the error for you?
- ❖ If not, under what circumstances does it occur?
- ❖ Check for real-world common causes.
 - ❖ Electrical or grounding issues, cabling or connections, temperature or dust problems.
 - ❖ Unplug and re-plug connections.

Things to Assess - changes

- ❖ Directory, firewall, DNS, DHCP, Network Services
- ❖ Hardware upgrade or damage, unusual noises
- ❖ Software updates, upgrades or installs
- ❖ Abnormal user activity (forced quits, settings, etc.)
- ❖ If other machines are having the same issues, what do they have in common?



The Nuts & Bolts

Best Practices - Always

- ❖ Check typical causes & easily tested probabilities
- ❖ Half-splitting: Eliminate variables
- ❖ Check your assumptions
- ❖ Make unknowns known
- ❖ Replace suspect things with known-good things
- ❖ Use your resources: Search engines, post on lists, consult colleagues, call tech support
- ❖ Give your brain time to digest: 'Sleep on it'



Physical Tools



- ❖ Service HD, Netboot HD
- ❖ Known good bootable OS(s)
- ❖ Diagnostic applications
- ❖ Common installers & updaters
- ❖ Known good cables, clean power

Apple Tools

- ❖ Command line shell: **Terminal**
- ❖ Log Reader: **Console**
- ❖ System Activity: **Activity Monitor**
- ❖ Network Tools: **Network Utility**
- ❖ Directory Services Editor: **WorkGroup Manager**
- ❖ Server Services: **Server Admin / Prefs**
- ❖ System & Configuration Data: **System Profiler**

Third Party Tools

- ❖ Command line manuals: ManOpen
- ❖ Directory Queries: LDapper
- ❖ Files & Permissions: BatChmod
- ❖ Network Discovery: Bonjour Browser
- ❖ Plist Viewers & Editors: PlistEdit Pro, TextMate
- ❖ Text Editors: BBEdit, TextWrangler
- ❖ Disk Utilities: Disk Warrior, CopyCat X, DriveGenius, AppleJack, TechTool Pro, CCC

Command Line Tools

- ❖ DNS & Directory Services: `changeip -checkhostname`,
`dcs1, dscacheutil -flushcache`,
`host, hostname`
- ❖ Files & Permissions: `chmod, chmod -a, chown`,
`fsck, ls, ls -la, ls -le`
- ❖ Network: `dig, ifconfig, ipconfig`,
`netstat, ping, traceroute`
- ❖ System Activity: `tail, top, ps`
- ❖ Text Editors: `nano, pico, vi, emacs, etc....`

Printer Troubleshooting



- ❖ Beware of errors due to printer sharing vs. network printers
- ❖ Are the issues computer or printer related?
- ❖ Check the drivers
- ❖ Delete and re-create the queue
- ❖ Reset the print system (For pre-lion systems see fixamacsoftware)

Network Troubleshooting

- ❖ Isolation of problems: How to diagnose the invisible
- ❖ Wireless vs. Wired Techniques
Wi-Spy, EaKiu, WireShark
- ❖ When might you need a router expert?

