Troubleshooting Flowcharts
Desktop Computers
Desktop Computer Startup Problems

Isolating a Hardware Problem

- System Self-Tests—Start up the customer's system, and listen for diagnostic error chords.
- Diagnostic Software—If the system passes the self-tests but the problem persists, try running the appropriate MacTest Pro program. If you suspect a hard drive problem, you should also run the Macintosh Hard Drive Test program.
- Symptom Charts—If the customer's system (or MacTest Pro) does not boot or MacTest Pro fails to find the problem, refer to the symptom charts in the manual that covers your customer's computer. If you think you recognize the problem and you have the necessary replacement module with you, try module swapping.
• Troubleshooting Flowcharts—If the customer’s system (or MacTest Pro) does not boot or MacTest Pro fails to find the problem and the problem is not clearly defined or not listed in the symptom charts, refer to the flowcharts in this section. These flowcharts present a step-by-step procedure for isolating the problem.
Hardware Troubleshooting Guidelines

1. Use only known-good test equipment and diagnostic programs.

2. The troubleshooting tools are designed to test a system in its minimum configuration. Disconnect external peripherals and remove all NuBus cards. After verifying that the computer is fully operational, reinstall or reconnect and test each expansion card and external device one at a time.

3. When using the symptom charts in the manual that covers your customer’s computer, always try the solutions one at a time, in sequence, until you fix the problem. If the problem remains, reinstall the original module before trying the next solution.

4. The hardware troubleshooting flowcharts verify each repair action by looping back to the start (Flowchart 1).
If a repair does not fix the problem, reinstall the original module, return to the flowblock of origin, and perform the next repair action on the list.

5 When instructed to replace the logic board only, place the customer's SIMMs on the replacement logic board. There is never a need to move the ROM SIMM from one logic board to another. Certain logic boards, built early in production, use a ROM SIMM. Boards produced later have ROMs mounted directly on the logic board. Moving the ROM SIMM will cause the board to be rejected by Apple.

6 Always verify that the original problem has been fixed. To verify that the original problem is fixed, duplicate the conditions under which it appeared. To verify that there are no additional faults, run MacTest Pro.
Flowchart 1 Startup Problems

NOTE: At startup you should hear a medium-pitched soft chord.

START

Turn on system without startup disk.

Is startup sequence normal?

No

Go to Flowchart 2.

Yes

Does disk icon with flashing "?" appear?

No

Go to Flowchart 4.

Yes

Boot appropriate MacTest Pro disk.

Does MacTest Pro main screen appear?

Yes

Run MacTest Pro. Verify there are no system faults. Run Hard Disk Test.

END

Yes

Run MacTest Pro. Verify there are no system faults. Run Hard Disk Test.

No

Go to Flowchart 6.

Shut down and install known-good MacTest Pro disk. Switch on power.
If an error is encountered at startup you will hear:
1. A medium-pitched startup chord
2. An error chord (a short, harsh chord)
3. A test monitor chord (four tones, low to high)

Is the startup chord normal?

Yes → Return to Flowchart 1
No → The system detects a RAM SIMM or hardware problem:
1. Replace bad SIMMs on logic board.
2. Replace logic board. Install customer's SIMMs on replacement logic board.
3. Replace the original logic board and install known-good SIMMs on original logic board.

Go to Flowchart 3

NOTE: During a normal chord sequence, you'll hear a single, medium-pitched startup chord only.

NOTE: If the first corrective action doesn't fix the problem, return the system to its original condition and perform the next action.
Flowchart 3 Startup Problems

START

1. Disconnect hard drive power and data cable connectors.
2. Disconnect disk drive 2 cable.
3. Run system from drive 1 only.

Switch on system without startup disk.

Is any video displayed? Yes

Is video displaying unrecognizable garbage? Yes

1. Replace video cable.
2. Replace monitor. If now OK, troubleshoot replaceable RAM on bad card.
3. Replace logic board SIMMs.
4. Replace logic board. Install customer’s SIMMs on replacement logic board.
5. Replace power supply.

Yes

1. Replace video interface card.
2. Replace monitor. If now OK, troubleshoot replaceable RAM on bad card.
3. Replace logic board SIMMs.
4. Replace logic board. Install customer’s SIMMs on replacement logic board.
5. Replace power supply.

1. Disconnect hard drive power and data cable connectors.
2. Disconnect disk drive 2 cable.
3. Run system from drive 1 only.

NOTE: Suspected problem areas include system video, system logic and control, and system power.

Go to Flowchart 5, section A.

Is an error icon displayed? Yes

Yes

Go to Flowchart 5.
Troubleshooting Flowcharts

Flowchart 4 Startup Problems

START

Turn off system power, remove the top cover, and check the lithium batteries with a voltmeter. The batteries must read:
3.0 V or higher: Macintosh Compacts, LC Series/Quadra 605, Performa 400 Series.
3.2 V or higher: Quadra 610, 650, 660AV, 800, 840AV, 900, 950, AWS 60, 80, 95, WGS 6150, 8150, 9150

Are batteries OK?

Yes

1. Replace power supply.
2. Replace logic board. Install customer’s SIMMs on replacement logic board.

No

Replace bad battery and reset system.

Is LED lit and fan running?

No

1. Replace video cable.
2. Replace monitor. If now OK, troubleshoot monitor.
3. Replace video interface card. If now OK, troubleshoot replaceable RAM on bad card.
4. Replace logic board SIMMs.
5. Replace logic board. Install customer’s SIMMs on replacement logic board.
6. Replace power supply.

Go to Flowchart 6.

Yes

Does disk icon with smiling face or flashing “?” appear?

No

Go to Flowchart 6.

Yes

Return to Flowchart 1.

NOTE: Suspected problem areas include system video, system logic and control, and system power.
Flowchart 5 Startup Problems

START

Switch off system power and remove cover. Disconnect:
1. SCSI data cable (from both hard drive and CD-ROM drive)
2. SCSI power cable (from both hard drive and CD-ROM drive)

Restart the system.

Is any video displayed?

Yes

Insert MacTest Pro and switch on system power.

No

1. Replace drive cable.
2. Replace disk drive.
3. Replace power supply.
4. Replace logic board. Install customer’s SIMMs on replacement logic board.

Run MacTest Pro. Verify there are no faults.

Does the MacTest Pro main window appear?

Yes

No

Return to Flowchart 1.

1. Replace drive cable.
2. Replace disk drive.
3. Replace power supply.
4. Replace logic board. Install customer’s SIMMs on replacement logic board.

END
Flowchart 6 Startup Problems

START

Restart system with MacTest Pro.

Does the MacTest Pro main screen appear?

Yes

Run MacTest Pro. Run Macintosh Hard Drive Test. Verify absence of faults.

END

No

NOTE: Suspected problem areas include the hard drive, system logic and control, and system power.

1. Replace floppy drive cable.
2. Replace floppy drive.
3. Replace hard drive power and data cables.
4. Replace hard drive.
5. Replace power supply.
6. Replace logic board. Install customer's SIMMs or replacement logic board.

Return to Flowchart 1.