**apple computer inc.**

Apple ][ Technical Procedures

Section 3

Troubleshooting

**Contents:**

# Apple ][ Troubleshooting Chart

**NOTE:** The Probable Causes are listed in the order of probable failure. It is recommended that Probable Causes are checked or replaced in the order listed.

| Symptom | Probable Cause |
|---|---|
| Apple will not boot; drive comes on. | 1) RAM row E. <br> 2) RAM on Language Card at location E2. <br> 3) Motherboard |
| Programs run erratically, often crash. | 1) RAM <br> 2) Motherboard |
| No beep and no message is displayed; monitor has random characters on screen when the Apple is turned on; drive does not come on. | 1) RAM row C. <br> 2) "F8" ROM at location F3 on the motherboard. <br> 3) "F8" ROM on the Language Card at location E2. <br> 4) Motherboard |
| Peripheral does not work properly. | 1) Motherboard |
| Keys fail to remove appropriate character from the keyboard test on the Apple ][ diagnostic. | 1) Keyboard Cable <br> 2) Keyboard Electronic <br> 3) Keyboard Mechanical <br> 4) Motherboard |
| Applesoft or Integer BASIC fails to operate or is erratic. | 1) ROM <br> 2) Motherboard |
| Game I/O port malfunction (Check with diagnostic.) | 1) Game Paddles <br> 2) Motherboard |
| All video malfunctions (Graphics and Text) | 1) Motherboard |
| Cassette Interface malfunction | 1) Motherboard |

## Apple ][ Troubleshooting Chart

| Symptom | Probable Cause |
|---|---|
| Apple ][ system dead. (No beep, no video, no power light) | 1) Power Supply<br>2) Motherboard |
| Apple ][ system dead (No beep, no video, power light on). | 1) Power Supply<br>2) Motherboard |
| Speaker malfunction | 1) Speaker<br>2) Motherboard |
| No video display | 1) Video Cable<br>2) Video pot adjustment<br>3) Motherboard |

## Apple ][ Chip Swapping Chart

| Symptom | Location(s) | Defective Chip Type |
|---|---|---|
| Dead Apple System (Power On Light) | A2 | 74LS00 |
| | B1 | 74S174 |
| | B2 | 74S86 |
| | B13 | 74LS02 |
| | C1 | 74LS153 |
| | C2 | 74LS195 |
| No RESET or No Response | A13 | 555 |
| | B5 | 74LS174 |
| | B6 | 74LS257 |
| | B7 | 74LS257 |
| | B8 | 74LS174 |
| | B11 | 74LS08 |
| | C14 | 74LS32 |
| | E11,12,13 | 74LS153 |
| | F12 | 74LS138 |
| | F13 | 74LS138 |
| | F14 | 9334 |
| | H1 | 74LS08 |
| | H3,4,5 | 8T97 |
| | H8 | 6502 |
| | H10,11 | 8T28 |
| | H14 | 74LS5251 |
| Apparent ROM Problems | F12 | 74LS13 |
| | H1 | 74LS08 |
| Apparent RAM Problems | A2 | 74LS00 |
| | B5,8 | 74LS174 |
| | C14 | 74LS32 |
| | D2 | 74LS20 |
| | E2 | 74LS139 |
| | E11,12,13 | 74LS153 |
| | F2 | 74LS139 |
| | H1 | 74LS08 |
| No Video (Speaker does Beep) | A2 | 74LS00 |
| | A8 | 74LS257 |
| | A9 | 74LS151 |
| | A10 | 74LS194 |
| | B2 | 74S86 |
| | B10 | 74LS74 |
| | B13 | 74LS02 |
| | C2 | 74LS195 |
| | C11 | 74LS04 |
| | D11,12,13,14 | 74LS161 |

## Apple ][ Chip Swapping Chart

| Symptom | Location(s) | Defective Chip Type |
|---|---|---|
| No Text Mode | A3 | 74166 |
| | A5 | 1513 |
| | A8 | 74LS257 |
| | A9 | 74LS151 |
| | A10 | 74LS194 |
| | B2 | 74S86 |
| HIRES or LORES Problem | A0 | 74LS194 |
| | A8 | 74LS257 |
| | A9 | 74LS151 |
| | A11 | 74LS74 |
| | B4,9 | 74LS194 |
| | B10 | 74LS74 |
| | C11 | 74LS04 |
| | C12 | 74LS257 |
| | F14 | 9334 |
| | H1 | 74LS08 |
| | J1 | 74LS257 |
| Dark Screen | A2 | 74LS00 |
| | B1 | 74LS174 |
| | B2 | 74S86 |
| | C1 | 74LS153 |
| | C2 | 74LS195 |
| V or H SYNC Fails | C13 | 74LS51 |
| | C14 | 74LS32 |
| | D11,12,13,14 | 74LS161 |
| Wrong Page or Video Mode | B5,8 | 74LS174 |
| | B11 | 74LS08 |
| | B12 | 74LS11 |
| | B13 | 74LS02 |
| | C11 | 74LS04 |
| | C12 | 74LS257 |
| | E11,12,13 | 74LS153 |
| | E14 | 74LS283 |
| | F2 | 74LS139 |
| | F14 | 9334 |
| | H1 | 74LS08 |
| | J1 | 74LS257 |

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## Apple ][ Chip Swapping Chart

| Symptom | Location(s) | Defective Chip Type |
|---|---|---|
| Wrong or Bad CHRS | A3 | 74166 |
| | A5 | 1513 |
| | B5,8 | 74LS174 |
| | B6,7 | 74LS257 |
| Bad Cursor | A3 | 74166 |
| | B2 | 74S86 |
| | B11 | 74LS08 |
| | B13 | 74LS02 |
| Bad Graphics | A8 | 74LS257 |
| | A9 | 74LS151 |
| | A10 | 74LS194 |
| | A11 | 74LS74 |
| | B4,9 | 74LS194 |
| No Color | B12 | 74LS11 |
| | B13 | 74LS02 |
| | C13 | 74LS51 |
| Game Paddles Problem | F13 | 74LS138 |
| | H13 | 558 |
| | H14 | 74LS251 |
| Cassette Loading Problem | F13 | 74LS138 |
| | H14 | 74LS251 |
| | K12 | 741 OP AMP |
| Cassette Saving Problem | F13 | 74LS138 |
| | K13 | 74LS74 |
| Speaker Problem | F13 | 74LS138 |
| | K13 | 74LS74 |
| Keyboard Problem | A12 | 74LS02 |
| | B6,7 | 74LS257 |
| | B10 | 74LS74 |
| | C11 | 74LS04 |
| | F13 | 74LS138 |
| Peripheral Card in Slot Won't Work | H2,12 | 74LS138 |