

LED ERROR CODES

Reset
LED D20

ON

LED D20 ON

I I I I I	I I I I I	I I I I I
Phase 1	Phase 2	Phase 3
LED D20 OFF		LED D20 OFF
3 Seconds	5 – 6 Seconds	Remains OFF...

LED D5A (status 2) Blinking (should continuously blink) U53, Y5, U510 / U2 (red), U54

Flashes	Phase	Device being tested	Chips to check
1	1	EPROM Checksum-----	U15
2	1	Ensonics PCI ID-----	U41
3	1	3DFX Card PCI ID-----	Video Card
4	1	Ethernet PCI ID-----	U6
5	1	NVRAM Locations 0X7F6 and 0X7F7-----	U50
6	1	Base Memory Data Lines-----	U16, U17, U18, U19
7	1	Base MUX Address lines	
8	1	SIMM Memory Data Lines-----	U110, U111, U112, U113
9	1	SIMM Memory MUX Address Lines	
10	1	85C30 DUART Serial Chip-----	U25

Phase 2 starts: Test code copied into RAM

7	2	Base Memory Full Address Range
9	2	SIMM Memory Full Address Range
		<u>LED D20 TURNED OFF</u>
3	2	3DFX Chip Initialization

BOOT TEST SCREEN 1

- 3DFX Video Memory Test
- EPROM Checksum Test
- Ethernet Controller Chip Self Test
- IDE Hard Drive Detect and File Compare Test
- Sound Chip Initialization

BOOT TEST SCREEN 2

- Manually Test ALL Buttons
- Press BACKSPIN (GREEN) **OR** SERVICE (RED) to hear Test Tone
- Check Real Time Clock (Incrementing in seconds)
- Wait for Modem, Sign Port, and Card Reader Port to complete

BOOT TEST SUMMARY SCREEN

- Check to be sure that ALL Tests are PASSED
- Press START to run final Video test from Hard Drive

Golf FORE! Boot EPROM Tests

Golf FORE! Boot tests are started by holding down the START button while powering up or resetting the board.

- A. Internal Processor Registers are configured
- B. Nile is configured. Base and Simm memory is setup. PCI bus accesses are setup
- C. Detect XILINX Chip
 - Read 0x33aa55cc from PCI Configuration space 0x10000
 - Read 0x55555555 from PCI Configuration space 0x10004
 - Read 0xaaaaaaaa from PCI Configuration space 0x10008

If any of the above checks fail, the processor remains in a tight loop reading the three locations. If a bus error occurs, the processor goes to a tight fail loop in EPROM. This fail loop will continuously read EPROM location 0x80000.

- D. The LED is turned off
- E. Read I/O switch A and check START button to determine if it should run BOOT TESTS

If the START switch is pressed the following set of tests are run while the processor is executing code in the BOOT EPROM. If a test fails, the processor stops running the tests and goes into a tight loop flashing an error code on the LED (status 1). The error code is the test number.

1. BOOT EPROM checksum. A 32bit checksum is calculated over the entire range of the BOOT EPROM. A nonzero result is a failure.
2. Check for PCI Config ID of Ensonics Sound Chip ID = 13711274
3. Check for PCI Config ID of 3DFX Graphics Chip ID = 0005121A

4. Check for PCI Config ID of INTEL Ethernet Controller Chip ID = 12298086

Three read accesses of the ISA bus are done. No checks are made on the results. The accesses are simply a debugging aid. The locations are: 0xf5555, 0xeaaaa, 0xf5555

5. Battery Backed up RAM is tested. A read / write test of locations 0x7f6 and 0x7f7 are done.
 - Write 0x55 to location 0x7f6
 - Write 0xaa to location 0x7f7
 - Read and check location 0x7f6
 - Read and check location 0x7f7
6. Data line test of base memory. Data patterns are written and checked.
7. MuxAd line test of base memory. A portion of the chips memory is tested to exercise the MuxAd lines.
8. Data line test of the Simm memory. Data patterns are written and checked.
9. MuxAd line test of Simm memory. A portion of the chips memory is tested to exercise the MuxAd lines.
10. Test 85C30 DUART. Several read / write accesses are done to check this part.

Tests 2 through 10 are repeated 15 more times for a total of 16 loops through these tests. The BOOT EPROM checksum test is NOT repeated because it takes a long time to run.

After these lowest level tests are complete, the LED is turned on and the next level of test code is downloaded from BOOT EPROM into extended memory. It takes about 5 seconds to download the code. From this point on, test information will begin to output on Port B of the daughter serial card. The following tests are run.

- A more thorough memory test is done on the Base Memory. If this test fails the test program aborts and LED error code 7 is flashed.
- A more thorough memory test is done on the Simm Memory. If this test fails the test program aborts and LED error code 9 is flashed.
- At this point the LED is turned off and testing continues
- The 3DFX graphics chip is initialized. If this initialization process fails the test program aborts and LED error code 3 is flashed.
- At this point Test messages will start to be displayed on the screen.

BOOT EPROM TEST SCREEN 1

This page runs more extensive tests on hardware devices. The following tests are run.

1. 3DFX Video Memory Test. The video memory chips are tested. While this test is running various video test patterns will be visible in the screen.

2. EPROM checksum. (NOTE: If this test failed at initial powerup then LED error code would be blinking.)
3. Ethernet Controller Chip Self Test run. This test is run by the Ethernet controller chip itself and a pass / fail result is returned.
4. IDE Hard Drive Test. This test first tries to detect the presence of a hard drive. If detected then 2 files on the hard drive are compared. If the files are identical then the test passes.
5. Ensonic Sound Chip is configured, (NOTE: at this point no sound is generated, this is performed by the Technician on the next screen).

Once these tests have completed, the next test page can be started by pressing the START button.

BOOT EPROM TEST SCREEN 2

This test screen requires the Technician to do the following steps:

1. Test all buttons and switches. The button names are displayed and when pressed the name will display in white.
2. Test sound circuitry by pressing the BACKSPIN button for a GREEN board and the SERVICE button for a RED board.
3. Check that the REAL TIME CLOCK is incrementing in seconds correctly.

The Modem, Sign Port, and Card Reader Port are also being tested during this time. Loopback cables or actual equipment must be attached to the Sign and Card Reader connectors for the tests to complete.

Once all tests are complete press the LEFT and RIGHT buttons (GREEN)

OR

The LEFT and START buttons (RED), to move on to the next screen

BOOT EPROM SUMMARY SCREEN

This screen displays results of all the tests. When ready, press the START button to start the final video test.

FINAL VIDEO TEST

Pressing START causes the watchdog circuit to be tripped and the board will reset. At this time a test program will be loaded from the Hard Drive (NOTE: if the START button is held down at this time the BOOT EPROM tests will run again). This final test is a more thorough test of the 3DFX graphics chip and IDE Hard Drive Interface. If this test runs successfully, board tests are complete and the game program will load.