CLUSTER TESTS

To run the cluster tests, perform the following procedure:

1. After power-up and when the diagnostic menu appears, select C (press the C key) to initiate the cluster test.

If the workstation passes, a C appears on the screen. This test takes one second, then the diagnostic menu appears again.

If the workstation fails, an error code appears on the screen. See Table 3-2 for status and error code descriptions. The following is an error code example:

E:F2

2. Turn the power to the workstation OFF to terminate the cluster test mode.

Automatic Mode

The TM6000 must be connected to the System 6300/System 6600 to run automatic mode.

Once the TM6000 Workstation passes the tests performed in manual mode, turn the workstation power ON. Do not hold down the space bar.

The following display appears on the workstation video screen:

TM

B . . . .

● The T indicates that the workstation has just issued the program download command to the processing unit.

● The M indicates that the memory test was performed.

● The B indicates that the workstation is waiting to download a program from the processing unit.

When downloading is complete, the program that has been
loaded into the workstation uses the program logon
display to begin execution.

TM6000 STATUS CODES

As the TM6000 Workstation is bootstrapped, it goes
through diagnostic and bootstrapping routines operated
by the internal read only memory (ROM) microprocessor.
When an error is detected by the bootstrap ROM, the
error code appears on the video display. Though the
causes of an error may indicate the defective
component, the Customer Engineer is only required to
replace the board.

The general protocol of the RTOS Operating System
dictates that the processing unit poll the TM30, and
that the system processing unit and TM6000 exchange
messages. The firmware protocol symbols are listed in
Table 3-1 for reference when using Table 3-2 to
interpret status codes.

Table 3-1. Firmware Protocol Symbols

Symbol	Meaning
SNRM	Set Normal Response Mode
RIM	Request Initialization Mode
SIM	Set Initialization Mode
XID	Identification Frame
UP	Unnumbered Poll
UI	Unnumbered Data Frame
RD	Request Disconnect
DISC	Disconnect
UA	Unnumbered Acknowledge
UI'	Unnumbered Data Frame (with termination data)

15 June 1984

Table 3-2 lists the System 6300 status codes with their possible causes for the error (listed with the most likely cause first).

Table 3-2. TM6000 Status Codes

Status Codes	Description and Cause
A3	Serial input/output error.
	The serial input/output initialization routine detected an error in the serial input/output communications controller chip.
	Check TM30 logic board.
A4	8253 counter/timer error.
	The clock initialization routine detected an error in the 8253 programmable counter/timer chip.
	Check TM30 logic board.
A5	No set initialization mode (SIM).
	Request initialization mode (RIM) was sent to the processing unit (System 6300/System 6600), but no SIM was received. This indicates that the TM30 is able to receive but not transmit, or that the processing unit is able to transmit but not receive.
	Check: a. TM30 logic board (7201 and cluster communications logic). b. Cluster processor (System 6300/System 6600). c. Communications cable. d. Operating system of the processing unit (may have crashed).

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
A6	No unnumbered poll (UP) in initialization set normal response mode (SNRM).
	An unnumbered acknowledge (UA) or identification frame (XID) was sent to acknowledge the SIM sent by the processing unit, but the processing unit sent back an SNRM instead of a UA. The processing unit probably timed out while waiting for the UA or XID.
	Check: a. TM30 logic board (7201 and cluster communications logic). b. Cluster processor (System 6300/System 6600). c. Communications cable. d. Operating system of the processing unit (may have crashed).
A7	No UP in initialization (DISC).
	A UA or XID was sent to acknowledge the SIM sent by the S6300/S6600, but sent back a DISC instead of a UA.

15 June 1984

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
A9	No identification available.
	The initialization routine monitored the cluster communications line but never found a free identification number. This is usually caused by attaching more workstations to a cluster communications line than the operating system of the processing unit is designed to accept.

	Check:
	
	    a. That the number of TM6000 workstations on a cluster is less than 8.
	
	    b. The operating system of the System 6300/System 6600 (may have crashed).

AA	Identification failure.
	The initialization routine found free TM6000 identification numbers by monitoring the communications line, but errors were detected when it tried to use one. This is usually caused by a failure of the collision recovery algorithm and can be overcome by powering off then on each of the TM6000 workstations that collided.

Table 3-2.   TM6000 Status Codes (Continued)

Status Codes	Description and Cause
AB	Read identification timeout.
	The initialization routine timed out after waiting 10 seconds while monitoring the communications line for an identification number. This error code is only generated after a number of unsuccessful reads.
	Check: a. TM30 logic board (7201 and communications logic). b. Cluster processor (System 6300/Sytem 6600). c. Communications cable. d. Operating system of the processing unit (may have crashed).
AC	Bad address (dump routine).
	The identification number sent in a frame by the processing unit did not match the one expected.
	Check: a. Communications cable. b. TM30 logic board (7201 and communications logic).

15 June 1984

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
AD	Disconnected (dump routine) sent by System 6300/System 6600.
	The processing unit (System 6300/System 6600) sent a DISC because of excessive line or protocol errors or because of a conflict with the crash/dump file at the processing unit.
	Check: a. The system software package. b. That the file is not in use by another TM6000 that is dumping. c. That the file is large enough. d. The communication cable. e. The TM30 logic board.
AE	No UP – SNRM.
	Check: a. TM30 logic board. b. The processing unit (System 6300/System 6600).
AF	No UP – REJ.
	Check: a. TM30 logic board. b. The processing unit (System 6300/System 6600).

Table 3-2.   TM6000 Status Codes (Continued)

Status Codes	Description and Cause

B0	After transmitting a dump block, an unexpected response was received from the processing unit.
	
	Check:
	
	   a. Whether a TM6000 workstation is using the fixed identification mode.
	
	   b. TM30 logic board.

B1	A bootstrap block (frame type UI) was expected, but another frame type was received.
B2	A bootstrap block (frame type UI) was expected, but a SNRM was received.
	Check TM30 logic board.
B3	The processing unit sent a disconnect (DISC) because of files conflicting, or possibly because of excessive errors during transmission. Bootstrapping with no operating system can cause this error.

	Check:
	
	   a. That a disc is loaded in the processing unit's removable-disc drive.
	
	   b. Cluster communications cables.
	
	   c. TM30 logic board.

15 June 1984

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
B4	The software transferred from the processing unit is not a valid run file. Either the file is invalid, or the transmission was faulty or incomplete.

	Check:
	
	    a. The processing unit for an invalid operating system.
	
	    b. TM30 logic board.
	
	    c. The processing unit's communication I/O processor for a crash.

B5	Excessive input/output errors occurred while the bootstrap interface block was being read.

	Check:
	
	    a. TM30 logic board.
	
	    b. Cluster communications cables.

B6	No response was received from the processing unit (System 6300/System 6600) during a read operation.
	Check the processing unit operation system (may have crashed).
B7	Write direct memory address (DMA) count is bad.
	After completion of a write operation, the bootstrap ROM determined that the entire block was not sent.
	Check TM30 logic board.
B8	Write operation did not properly complete.
	Check TM30 logic board.

Table 3-2. TM6000 Status Codes (Continued)

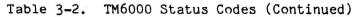| Status Codes	Description and Cause
B9	Bad bootstrap block format.
	A bootstrap block of an invalid length was received.
	Check the format of the bootstrap file for correctness.
BA	DMA error.
	After initializing the DMA channel for a read or write operation, the DMA controller did not contain the same information that was written to it.
	Check TM30 logic board.
BB to DF	Unused.
E0	ROM checksum error.
	There is a bad ROM chip on the TM30 logic board at device location 3H. This error is displayed on the keyboard indicators, not the video display. See Section 5, Figure 5-3.
	Check TM30 logic board.
E2	Random access memory (RAM) read and write 0's error.
	Check TM30 logic board.
E3	RAM read and write 1's error.
	Check TM30 logic board.

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
E4	RAM read and write address error.

	An error occurred during the read and write RAM test. All 1's, all 0's, or the sum of DS and DI are written, read, and compared. The comparison showed that the DS and DI were not identical. The error display for E2, E3, E4, and E5 (below) is:
	
	    E: E2
	    1000:675C 0000 0002
	
	where
	
	    E: E2 is the error code.
	    1000:675C is the hexadecimal address.
	    0000 is the expected value.
	    0002 is the received value.
	
	Check TM30 logic board.

E5	RAM address test error.
	An error occurred during the RAM addressing test. After completion of the RAM read/write address test, each RAM word should contain the sum of its own DS DI. The RAM address test verifies that this is true. This error can be caused by a short or an always low address line allowing different addresses to be written to the same RAM. It may also be caused by memory that picks up or drops bits when idle.
	Check TM30 logic board.
E6	Keyboard initialization error.
	An error occurred while the bootstrap ROM was initializing the hardware or performing keyboard interface diagnostics.
	Check TM30 logic board.

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
E7	RS-232-C serial test failed.
	The CPU sends out a binary count pattern through the 8251 serial port and waits for it to return (through the installed looping plug). It the pattern is late or wrong when it returns, the error occurs, indicating a serial I/O malfunction.

	Check:
	
	    a. TM30 logic board (8251, 1488, 1489).
	
	    b. The loopback connector.

E8-FF	Unused.

The F0-F9 error codes are generated by the communications test (menu option C). They indicate problems with the cluster communications and DMA logic or that the cluster cable was still connected to the TM6000 workstation when the test was started.

F0	Underrun transfer ready not set.
	The transmit underrun and/or transmit buffer empty bits were not set after a reset.

	Check:
	
	    a. The cluster communications cable for disconnection from the terminal.
	
	    b. TM30 logic board.

15 June 1984

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
F1	CTS and/or DCD set.
	The CTS and DED status bits were not set after the transmitter was enabled.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.
F2	Carrier not clear.
	The status bit did not clear after the transmitter was disabled.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.
F3	DMA write receive not ready.
	The character received in the receive buffer does not match the one written to the transmit buffer in a DMA transfer.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.

Table 3-2. TM6000 Status Codes (Continued)

Status Codes	Description and Cause
F4	Data error in DMA write.
	The character received in the receive buffer does not match the one written to the transmit buffer in a DMA transfer.

	Check:
	
	    a. The cluster communications cable for disconnection from the terminal.
	
	    b. TM30 logic board.

F5	Frame error in DMA write.
	Though all characters within the frame were received correctly, no end-of-frame (EOF) character was received in a DMA transfer. This usually indicates chip failure.

	Check:
	
	    a. The cluster communications cable for disconnection from the terminal.
	
	    b. TM30 logic board.

F6	Timeout waiting for DMA read ready.
	A character was written using programmed input/ouput to the transmit buffer, but no character was received in the receive buffer.

	Check:
	
	    a. The cluster communications cable for disconnection from the terminal.
	
	    b. TM30 logic board.

Table 3-2.   TM6000 Status Codes (Continued)

Status Codes	Description and Cause
F7	DMA read end-of-frame (EOF) not set.
	A frame was written using programmed input/output to the transmit buffer. Though all characters within the frame were received correctly, no end-of-frame (EOF) character was received. This usually indicates a chip failure.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.
F8	DMA read data error.
	The character received in the receive buffer does not match the one written.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.
F9	Carrier set after DISC.
	The DCD bit is still set. The most probable cause of the problem is the cluster communications cable.
	Check: a. The cluster communications cable for disconnection from the terminal. b. TM30 logic board.
FA-FF	Unused.

CLEANING THE TERMINAL

If the video display screen needs cleaning, use a glass cleaner and a soft cloth. Abrasive cleaners can damage the anti-reflection coating on the screen surface. To prevent liquid from entering the display housing, spray the cleaner on the cloth and then wipe the screen.

If the plastic housing needs cleaning, use a damp, clean cloth and gently wipe the surfaces. Be careful not to get liquid into the keyboard.