

SECTION SIX

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DIAGNOSTIC ROUTINES

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6/ DIAGNOSTIC ROUTINES.

There are some diagnostic routines stored in the EPROM (Erasable Programmable Read-only Memory) on the CPU Board. These routines consists of a tiny monitor, RAM memory testing, video circuit testing and testing on minifloppy disk drives. They are useful especially to the computer servicing people and to the users themselves as well. It helps you fix the problems and fault, and then have them repaired more quickly. You will find it enjoyable to troubleshoot the computer system yourself.

Nevertheless, these diagnostic routines are only troubleshooting aids. You are still urged to have the system repaired by the servicing people, and you can describe the faults according to the diagnostic routines.

TEST NUMBER	TEST FUNCTION
0	tiny Monitor (machine language)
1	Bank 0 RAM Test.
2	Video Test.
3	Single-density Single-sided Drive Test.
4	Single-density Double-sided Drive Test.
5	Double-density Single-sided Drive Test.
6	Double-density Double-sided Drive Test.

6.1 Enter and Exit from the Diagnostic Routines.

To enter these routines, depress the keys

RESET - n

where n is an integer from 0 to 6, and each number corresponds to one specific test.

Press the number key and the RESET keys simultaneously, and first release the RESET keys and then the number key.

NOTE: As one of the routines is just entered, the number n will appear at the top left corner of the screen.

Depress the BREAK Key to exit from any routines (except the Video Test) to the display mode of the Tiny Monitor.

You can exit to 'NEWDOS READY' just by pressing the two RESET keys only.

6.2 RESET - 0 : Tiny Monitor.

This routine allows us to examine, modify and execute memory contents of the BOOT ROM (but no modification), and most of the RAM memory. (We cannot examine and modify the RAM memory addresses which are occupied by the ROM).

There are three modes of operation : Display mode, exchange mode and run mode.

(1) Display mode

Type mmmmD

where mmmm is the starting memory location in hexadecimal to be examined.

A line of 16 bytes of consecution memory contents starting from location mmmm will be displayed. Press NEW LINE key (or any key other than the E key or G key) to display next 16 bytes of memory contents.

Example:

34FED FF FF 1E 2D 33 28 4A FE F0 2C 35 0E 01 D0 1E 2C

location content

(2) Exchange Mode

Type xxxxE

where xxxx is the starting memory location in hexadecimal to be modified.

The address of the memory location and its content will be echoed, and then you can type in the new data (two digits) in hexadecimal. The content of the next location will be displayed and the system waits for your new data entry.

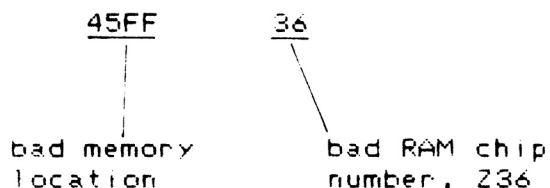
This exchange mode can be terminated by pressing NEW LINE or BREAK key.

6.3 RESET - 1 : RAM Test (Bank 0)

This routine tests the operation of the 64K byte RAM chips and their interfacing circuit which contains the address decode logic and data buffers. It checks that every bit of the memory can properly be written or read a one/zero without error.

Defect messages are as follows. When any error occurs, the test routine will stop and display the bad memory location and RAM chip number (from 231 to 262).

Example:



Press NEW LINE or any other keys to proceed to test other memory locations.

Note that if many RAM chips are reported bad (or dead), then the fault may be in the address decode logic rather than the memory chips.

6.4 RESET - 2 : Video Test.

This routine checks the video interface circuits, video RAM and the character generator.

As the system has just entered this test, you may come across two fault message if there are the faults.

They are

'BANK SWITCHING ERR' and 'BAD RAM'.

If neither of these faults are present, the test will proceed to display cycling patterns of all the available the characters and graphics. You can press the BREAK key to hold a pattern of the characters and graphics. Then individual characters / graphics may be examined and see if they are correct.

6.5 Minifloppy Disk Drive Tests.

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These tests check the two built-in disk drives with various storage formats such as single/double side, and single/double density. Note that the two drives must be of the double track type.

The following message will appear on the screen.

SINGLE (or DOUBLE) SIDE

SINGLE (or DOUBLE) DENSITY

TEST COMPLETED

if the drives under test
are all right.

This test routine will give the error messages as below.

DISK ERR AT (track number) (drive number)

where drive number is 0 or 1.

The test will stop at the disk error, and you are required to press NEW LINE or any other keys to continue the test.

To enter these drive test routines as follows.

- (1) RESET - 3 : single density, single side.
- (2) RESET - 4 : single density, double side.
- (3) RESET - 5 : double density, single side.
- (4) RESET - 6 : double density, double side.

Normally, the two built-in floppy disk drives are of the double density, single side and double track types.

PRECAUTION: avoid depressing the RESET keys to reset the System when the disk drive is reading or writing (that is, the LED on the drive is ON.) Try to open the door of the disk drive, and the LED will turn OFF soon. Then, remove the disks and switch off the computer.