ALTOS

486

Diagnostics

486 Diagnostics

ACKNOWLEDGEMENTS

About this Manual

This manual explains how to use the System
Diagnostic Executive (SDX) verification programs
and utilities.

The verification programs can help you pinpoint
problems should the 486 system malfunction.

The programs and utilities are loaded from the
diagnostic floppy diskette supplied with your
system. You are then asked to respond to a
series of questions and prompts provided by
the program.

**HOW THIS
MANUAL IS
ORGANIZED**

The _486 Diagnostic Manual_ contains three
chapters and two appendixes.

Chapter 1 contains general information about the
recommended test sequence and instructions for
loading the Diagnostic programs.

It also contains information for copying
diskettes, which is the first thing you should do
with your Diagnostic diskette.

Be sure to read Chapter 1 before running any of
the verification routines.

Chapter 2 contains instructions for using the
utility programs that are contained on the
Diagnostic diskette.

Chapter 3 describes each of the diagnostic
programs that test the components of the 486
system.

Appendix A explains error messages you may
encounter while running the diagnostic programs.

Appendix B describes how to construct a loopback connector, which you will need to run two of the Serial Port diagnostic tests.

DATA ENTRY CONVENTIONS

Special type conventions are used throughout this manual. The most important of these are:

o   Information that you enter in response to a prompt appears in boldface type; for example, enter **Y**.

o   The Escape key appears in this text as **<ESC>**.

o   The RETURN key appears in this text as **<CR>**. Pressing the RETURN key usually enters the data that was previously typed.

o   Alphabetic data can be entered in upper or lower case.

o   The CONTROL key is used in combination with other keys. When you use the CONTROL key, press it and hold it down while you press the other key.

o   **nnn, nn** or **n** stands for a number that appears on the screen; **nnn** indicates a three digit number, **nn,** a two digit number, and so forth.

o   To erase the last character typed, use CONTROL H, or BACK SPACE. This will work in most cases.

o   To erase an entire entry, use the RUBOUT or DELETE key.

RELATED PUBLICATIONS

486 Setting Up Guide, P/N 690-15889-001

486 Maintenance Manual, P/N 690-15683-001

486 System Reference Manual, P/N 690-15707-001

Contents

Before You Begin **1**

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**GENERAL
INFORMATION**

This manual explains how to use the Diagnostic diskette that comes with your 486 system.

The System Diagnostic Executive (SDX) diskette contains menu-driven utility and verification programs to pinpoint problems with your system and perform such tasks as copying floppy disks.

You can test the following components of your system:

o   Central processing unit (CPU)

o   Random Access Memory (RAM)

o   Serial communication channels

o   WorkNet interface

o   Hard disk drive

o   Floppy diskette drive

The utility programs on the Diagnostic diskette include:

o   Floppy diskette format

o   Floppy diskette copy

o   Hard disk format

o   Flag hard disk bad sector

After a test is run, a pass or fail message appears on the display screen. If a failed message appears, contact authorized personnel or your local dealer.

**BEFORE YOU
START**

The **first and most important** thing you should do with your Diagnostic diskette is to format diskettes and make copies of the Diagnostic diskette and operating system diskettes that are shipped with your 486 system. This way you always have a backup disk. Be sure to write-protect your backup copies.

You should make two backup copies of the Diagnostic diskette. Store the master diskette in a secure place and use one of the copies to run the Diagnostics.

Formatting and copying floppy diskettes are explained in Chapter 2.

RECOMMENDED TEST SEQUENCE

After formatting and copying your diskettes, it is recommended that you run the System Test, with the hard disk **not** included, to verify that your system is operating properly. The System Test verifies the floppy disk drive and the memory.

It is a good idea to run this test before you install an operating system.

Refer to the System Test section in Chapter 3 for instructions.

HOW TO BEGIN

The following step-by-step instructions tell you how to load the SDX (System Diagnostics Executive) programs into the Altos 486 Computer System.

Step 1.   Insert the diagnostic diskette as shown in Figure 1-1.
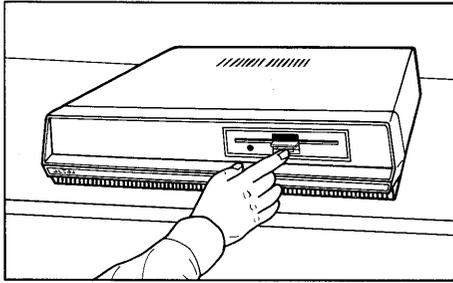
1) **Open the Floppy Drive Slot.**

    Press in the door latch where shown.
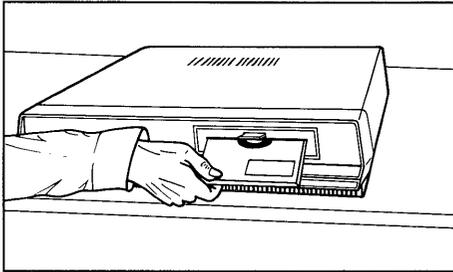
2) **Insert the diskette.**

    With the label side facing up and toward you, carefully insert the diskette until it locks in place.
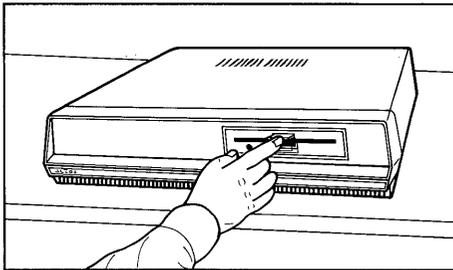
3) **Close the drive door.**

    Slide the door latch down until it locks in place.

Figure 1-1. Loading the Diskette into the Disk Drive

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Step 2.   Turn ON the system. The following prompts
         appear on the screen.

NOTE

Be ready to quickly press a key when the
screen says "PRESS ANY KEY TO INTERRUPT
AUTO-BOOT."

```
486 MONITOR      nn.n


Power-up test ... passed


System configuration:
Memory size (KB) = nnn
Hard disk(s): 1
Floppy drive(s): 1

PRESS ANY KEY TO INTERRUPT AUTO-BOOT
```

NOTE

If you do not press a key at this point,
the system may attempt to load the current
operating system from the hard disk. If
the system does boot from the hard disk,
you will have to turn off your system and
repeat the previous steps.

Step 3. After pressing any key to interrupt
        the auto-boot, the screen displays:

```
      Select [1] to boot from Hard Disk
             [2] to boot from Floppy Disk
             [3] to boot from Worknet
             [4] to enter Debugger

      Enter option:
```

Step 4. Type 2 to load the Diagnostic diskette
        from the floppy disk drive. After a
        few seconds, the Main Diagnostic
        Menu appears:

```
          S Y S T E M   D I A G N O S T I C   E X E C U T I V E

                          version - nn.n


      Main Diagnostic Menu
        (A) Utilities              (B) Diagnostics
      Enter:
```

If for some reason the Main Diagnostic Menu does
not appear, repeat the steps above.

Using the Utility Program 2

CONTENTS

This chapter describes the utility programs included on your SDX diskette. You can use these programs to format and copy floppy diskettes, format the hard disk, and flag and list hard disk bad sectors.

To use the utility programs, load the Diagnostic diskette as described in Chapter 1 and select **A** from the Main Diagnostic Menu.

The screen displays:

```
Utilities Menu

(A) Hard Disk Display Flagged Sector     (D) Floppy Disk Copy
(B) Hard Disk Flag Bad Sector            (E) Floppy Disk Format
(C) Hard Disk Format                     (F) Return to Main Menu


Enter:
```

The following paragraphs describe each selection of the Utilities Menu.

HARD DISK DISPLAY FLAGGED SECTOR

This program displays a summary of all the flagged sectors that exist on your hard disk.

To run this program, select **A** from the Utilities Menu. The screen displays:

```
Hard Disk Display Flagged Sector    nn.n

Press <ESC> to quit

   (A) Drive 0
   (B) Drive 1

Flag sectors are displayed at the end of pass,
press <CR> to begin or <ESC> to quit
```

You must specify which hard disk to test. Select
A to test the built-in disk. Select B to test an
added hard disk.

After you specify which hard disk to test, the
screen displays:

**Flag sectors are displayed at the end of pass,
press <CR> to begin or <ESC> to quit**

Press <CR> to continue. If you wish to return to
the Main Diagnostic Menu, press <ESC>.

After pressing <CR>, the screen displays:

recalibrating

NOTE

This message usually appears on the screen
briefly, then disappears. Do not be alarmed
if it doesn't appear on your screen.

Next, the screen displays:

Cyl: nnn   Hd: n

The program reads through the cylinders and heads, then lists these as they are checked. One complete pass reads all cylinders and takes about four minutes.

At the end of a complete pass, or after you press <ESC>, the screen displays the status of the sectors checked up to that point.

If no flagged or bad sectors were detected, the screen displays:

**** Summary ****

No flagged sectors were detected.

Do you wish to run this program again? (y or n)

If you select Y, the system will run the program again. If you select N, the program returns to the Main Diagnostic menu.

If flagged or bad sectors were found, the screen displays:

**** Summary ****
Found nn bad sectors on this disk.

Cylinder	Head	Logical Sector	Physical Sector	Status
nnn	n	nn	nn	FLAGGED
nnn	n	nn	nn	NOT FLAGGED

Press <CR> to continue.

NOTE

> The program displays up to 40 flagged
> and bad sectors. If there are more than
> 40, the remainder will not be displayed.

If sectors appear that are not flagged, make a
note of the information displayed on the screen.
You will need this information to flag these sectors
as bad so that they will not be used for storing
information.

To flag a bad sector, see the next section of this
chapter, "Hard Disk Flag Bad Sector."

Press <CR> to continue and the following message
appears:

Do you wish to run this program again? (y or n)

If you select **Y**, the program runs again.   If
you select **N**, the program returns to the Main
Diagnostic menu.

**HARD DISK
FLAG BAD
SECTOR**

This program flags known bad sectors on the hard
disk so that they will not be used for storing
data.

Each system is tested before it is shipped from the
factory, and any known bad sectors are flagged at
that time.

The Hard Disk Flag Bad Sector program should be
used only if the Hard Disk Display Flagged Sector
program reports an unflagged sector.

CAUTION

After you begin to enter data into your
system, do not use this program to set
additional bad sector flags, unless you
have a backup of your files.

Once you have flagged a sector as bad, the
system will stop accessing that particular
sector. Any data located in that sector
is lost.

You will usually have to reinstall your
operating system after flagging additional
bad sectors.

Follow these instructions to run the Hard Disk
Flag Bad Sector program.

Select **B** from the Utilities Menu. The screen
displays:

```
    Hard Disk Flag Bad Sector Routine   nn.n

    (A)   Begin Execution
    (B)   Return to Main Menu

    Enter:
```

Select **A** to begin the program. The program
prompts you for information regarding the sector
you wish to flag as bad. This is the same
information provided by the Hard Disk Display Bad
Sector program.

You can flag only one sector at a time. Enter
the information as prompted and press <CR>. Enter
either the physical or logical sector number; you
do not need to enter both.

If you bypass the sector number (by pressing
<CR>), you are prompted to enter the byte number
in either decimal or hexidecimal form.

This information can be found on the Hard Disk
Error Map (also called a Media Defect Report)
attached to the hard disk in side 486 system.
You have to remove the 486 cover to see the map.
It lists flagged bad sectors by track, head,
byte count, and length in bits.

If you enter the byte number in decimal, you will
not see the hexidecimal prompt.

If you decide not to flag a sector as bad after
entering the information, or if you make a mistake
while entering the information, press <ESC> to
return to the Hard Disk Flag Bad Sector Menu.

After you flag a bad sector, you can choose to
flag another bad sector. If you choose not to,
the screen displays:

```
  Do you wish to add this information to the list? (y or n)
```

You should answer Y to this prompt so that the
newly flagged sector becomes part of a permanent
list of flagged sectors. The Hard Disk Format
program uses this list to automatically flag bad
sectors after reformatting the hard disk.

If you answer N, this sector will not automat-
ically be flagged if you reformat the hard disk.

After responding to this prompt, the program
returns to the Hard Disk Flag Bad Sector Menu.

**HARD DISK
FORMAT**

The hard disk is formatted prior to shipment from the
factory. Formatting places the cylinder and sector
addresses on the disk, and blocks out areas that can
be written to.

It is usually not necessary to reformat a hard disk
once it is formatted. Doing so destroys all data
(user files, applications, operating systems) on
the disk.

If you enter the sector number, you will not be
prompted to enter the byte number.

If you bypass the sector number (by pressing
<CR>), you can enter the byte number in either
decimal or hexidecimal form, depending on the
information contained on the Hard Disk Error Map.

If you enter the byte number in decimal, you will
not see the hexidecimal prompt.

After you flag a bad sector, this screen displays:

```

      Do you wish to flag a bad sector? (y or n)

```

Select Y to flag other bad sectors. Select N
to return to the Main Diagnostic Menu.

HARD DISK   The hard disk is formatted prior to shipment from the
FORMAT   factory. Formatting places the cylinder and sector
                     addresses on the disk, and blocks out areas that can
                     be written to.

                     It is usually not necessary to reformat a hard disk
                     once it is formatted. Doing so **destroys all data**
                     (user files, applications, operating systems) on
                     the disk.

                     However, it may be necessary to reformat the hard
                     disk when your system is first installed or when
                     you need to replace the disk.

                     Reformatting also erases any bad sector flag
                     indicators.

                     Bad sectors are flagged before a system is shipped
                     from the factory and are noted on the Error Map
                     (Media Defect Report) provided with the hard disk.

                     When bad sector flags are erased, all sectors
                     previously marked as bad will be used to store
                     data. Data stored in such a sector can be lost.

Before reformatting, run the Hard Disk Display
Flagged Sector utility and note any flagged
sectors reported. You will need this information
to flag these sectors as bad.

Be sure to re-flag these sectors. See the "Hard
Disk Flag Bad Sector" section in this chapter for
instructions.

CAUTION

> Before formatting a hard disk, make sure
> that you have a backup of any files you
> want to keep. Formatting will destroy
> any data (including the operating system
> and applications) stored on the disk.

Because reformatting your hard disk does destroy
data, you need a password to run this utility.
Contact your authorized dealer for the password.

To run the format utility, select C from the
Utilities Menu. The screen displays:

```
Hard Disk Format Routine  nn.n

** CAUTION **
This program will destroy the present contents of the hard disk.
To format, enter the password then <CR>, otherwise press <ESC>
to quit
```

After you enter the password, press <CR> and the
screen displays:

```
(A)  Drive 0
(B)  Drive 1

Enter:
```

You must specifiy a hard disk to test. Select
A to test the built-in hard disk. Select B to
test an added hard disk.

Next, the screen displays:

```
|                                                     |
|                                                     |
|     recalibrating                                   |
|                                                     |
|                                                     |
```

NOTE

This message usually appears on the screen
briefly, then disappears. Do not be alarmed
if it doesn't appear on your screen.

Formatting begins and the screen displays:

```
|                                                     |
|                                                     |
|     Now formatting -- Press <ESC> to quit           |
|     [cyl/hd] nn      n                              |
|                                                     |
|                                                     |
```

If you press <ESC> before the program begins
formatting, you are asked if you want to continue.
Press Y if you want to format the hard disk.
Press N to return to the Utilities Menu.

When formatting is complete, the screen displays:

```
|                                                     |
|                                                     |
|     Format completed.                               |
|                                                     |
|     Press <CR> to return to Main Menu.              |
```

FLOPPY DISK
COPY

Floppy Disk Copy is a utility program that copies data from one diskette to another. This procedure is done in two parts and takes about four minutes to complete.

You can only copy data onto a formatted floppy diskette. Make sure that you have formatted diskettes before you begin the Floppy Disk Copy program.

To format a diskette, follow the instructions in the section "Floppy Disk Format" in this chapter.

To copy a disk, you must first insert the diskette to be copied from into the disk drive unit. The computer then "reads" the first part of the information from the diskette and stores this data into system memory.

Next, you remove the diskette that you are copying from and insert the new diskette that you are copying to into the disk drive unit.

After the first part of the data has been "written" onto the new diskette, the program prompts you to reinsert the diskette to be copied from so the second part of the copying process can begin.

During each part of the routine, numbers display on the screen indicating that data is being written onto or read from a diskette.

NOTE

To ensure that you do not confuse the diskette being copied to with the diskette being copied from, place a write protect tab on the diskette you are copying from.

To copy a floppy diskette, select D from the
Utilities Menu. The screen displays:

```
Floppy Copy Routine  nn.n
This routine is done in two parts.

Press <ESC> to abort


Insert diskette to be copied FROM, press 'y'
```

If you press <ESC> at this point, you are
prompted to insert the Diagnostic diskette and
press <CR> to return to the Main Diagnostic
Menu.

Insert the diskette to be copied from and press Y.
The screen displays:

```
*** Reading cyl: nn
```

After the first read cycle is completed, the
screen displays:

```
Insert diskette to be copied TO, press 'y'
```

Insert the diskette to be copied to and press **Y**.
The screen displays:

```
*** Writing cyl: nn
```

After the first write cycle is completed, repeat the
preceding steps to complete the Floppy Disk Copy
program.

When the program is complete, the screen displays:

```
Copy Completed

Do you wish to run this program again? (y or n)
```

Select **Y** if you want to make further copies
of floppy disks.

If you want to return to the Main Diagnostic
Menu, select **N** and follow the instructions
that appear on the screen.

**FLOPPY DISK
FORMAT**

The Floppy Disk Format program prepares a floppy
diskette to receive data. You must format a
diskette before you can store data on it.

NOTE

Formatting a floppy diskette erases any
data contained on that diskette. Do not
format a diskette that contains data
unless the data is no longer needed.

To format a floppy diskette, select E from the
Utilities Menu. The screen displays:

```
 _____

    Floppy Format Routine   nn.n
    Press <ESC> to abort

    Do you want track verification? (y or n)



```

If you select Y, each track will be verified
as it is formatted to assure that the formatting
process is successful.

Track verification increases the execution time of
the formatting process to approximately three
minutes for each diskette. Without track
verification, the process takes approximately one
minute.

After responding to the track verification prompt,
the screen reads:

```




    Insert diskette to be formatted and press 'y'



```

Remove the Diagnostic diskette from the disk drive
and insert the diskette to be formatted. Then
press Y.

As the diskette is formatted, the screen displays
the number of each cylinder. If you select track
verification, the screen also displays the number
of each cylinder as it is verified.

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After formatting is completed, the screen
displays:

```
    Format completed.

    Do you wish to run this program again? (y or n)
```

Select **Y** if you want to format additional floppy
diskettes.

If you want to return to the Main Diagnostic
Menu, select **N** and follow the instructions.

RETURN TO
MAIN
MENU

To leave the Utilities Menu and return to the
Main Diagnostic Menu, select **F**.

Using the Diagnostic Programs **3**

This chapter describes the 486 Diagnostics programs.
You can use these programs to check the major
components of the 486 system such as the CPU and
serial ports.

Like the Utilities programs, the Diagnostic programs
are a set of menu-driven routines. Select the tests
you want performed and respond to the prompts and
messages that appear on the screen.

To use the Diagnostic programs, load the Diagnostic
diskette as described in Chapter 1 and select B
from the Main Diagnostic Menu.

The screen displays:

```
Diagnostics Menu


(A) Memory Verification              (D) System Test
(B) Memory Management Verification   (E) Worknet Loopback
(C) Serial Ports                     (F) Return to Main Menu

Enter:
```

The following paragraphs describe each selection of the
Diagnostics Menu.

**MEMORY
VERIFICATION**

The Memory Verification Test determines the amount
of RAM (random access memory) your system has
available.

Two basic types of tests may be run:

o   Single Pass

o   Continuous Loop

Use the Single Pass test for a quick verification
of memory. This test takes about two minutes.

Use the Continuous Loop test to check for intermittent memory errors.

To run the Memory Verification Test, select **A** from the Diagnostic Menu.

The screen displays:

```
  Memory Verification    nn.n
    (RAM size = nnn Kb)

  (A)  Single Pass
  (B)  Continuous Loop
  (C)  Return to Main Menu

  Enter:
```

NOTE

The RAM size displayed on your screen indicates how much random access memory your system has. This number is listed in kilobytes (Kb).

Check to make sure the number is correct. If you don't know how much RAM your system should have, contact your dealer.

RUNNING A
SINGLE PASS

Select **A** to run a single pass of the Memory Verification Test. The screen displays:

```
    one pass takes approximately 2 minutes to complete
```

Messages such as "Doing memory refresh" appear on the screen as the parts of the Memory Verification Test are run.

When the test is complete, the screen displays a
message that Memory Verification passed or failed.

If Memory Verification was not successful, contact
authorized personnel or your dealer.

RUNNING A
CONTINUOUS
LOOP

Select B to run a continuous loop of the Memory
Verification Test. The screen displays:

```
    one pass takes approximately 2 minutes to complete

        *** Pass 1 (Press <ESC> to quit)***
```

Messages such as "Doing memory refresh" appear on
the screen as the parts of the Memory Verification
Test are run.

You may run as many passes as you want. At the
end of a pass, the screen displays:

```
    ***Pass 1   (Press <ESC> to quit) ***
    ***Pass 2   (Press <ESC> to quit) ***
               •
               •
               •
    ***Pass nn (Press <ESC> to quit) ***
```

You can stop the test before one pass is complete
by pressing <ESC>. The screen displays a message
that the operation stopped and returns to the
Memory Verification Menu. No passed or failed
message is displayed.

At this point, you can choose to run a single pass,
continuous loop, or return to the Main Menu.

If you press <ESC> any time after one pass is
completed, the screen displays a message that
Memory Verification passed or failed.

If Memory Verification is not successful, contact
authorized personnel or your dealer.

To return to the Main Diagnostic Menu, select C
from the Memory Verification Menu.

**MEMORY
MANAGEMENT
VERIFICATION**

The Memory Management Verification program tests the
circuitry associated with the memory management unit
on the main CPU board. This test determines whether
or not the circuitry is functioning.

There are two types of tests:

o   Single Pass

o   Continuous Loop

Select the Single Pass test to quickly check the
circuitry. Select the Continuous Loop test to
thoroughly check for any intermittent problems.

To run the Memory Management Verification test,
select **B** from the Diagnostic Menu.

The screen displays:

```
╭──────────────────────────────────────────────────────
│
│
│     Memory Management Verification      nn.n
│
│
│     (A)  Single Pass
│     (B)  Continuous Loop
│     (C)  Return to Main Menu
│
│
│     Enter:
│
│
│
```

RUNNING A   Select **A** to run a single pass of the test.   The
SINGLE PASS   screen displays:

```
│
│
│
│
│        One pass requires approximately 10 seconds to finish
│
│
│
```

When the test is completed, the screen displays a
message that Memory Management Verification passed
or failed.

If Memory Management Verification is not successful,
contact authorized personnel or your dealer.

RUNNING A
CONTINUOUS
LOOP

Select **B** to run a continuous loop of the Memory
Management Verification test. The screen displays:

```
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One pass requires approximately 10 seconds to finish
    ***Pass 1  (Press <ESC> to abort) ***
    ***Pass 2  (Press <ESC> to abort) ***
             .
             .
             .
    ***Pass nn (Press <ESC> to abort) ***
```

You can stop the test before one pass is complete
by pressing <ESC>. The screen displays a message
that the operation stopped and returns to the
Memory Management Verification Menu.

At this point, you can choose to run a single pass,
continuous loop, or return to the Main Menu.

If you press <ESC> any time after one pass is
completed, the screen displays a message that
Memory Management Verification passed or failed.

If Memory Management Verification is not successful,
contact authorized personnel or your dealer.

To return to the Main Diagnostic Menu, select C
from the Memory Management Verification Menu.

SERIAL PORT

The Serial Port tests check the communication
circuitry between the control unit and equipment,
such as terminals or a printer, connected to your
system. See Figure 3-1.
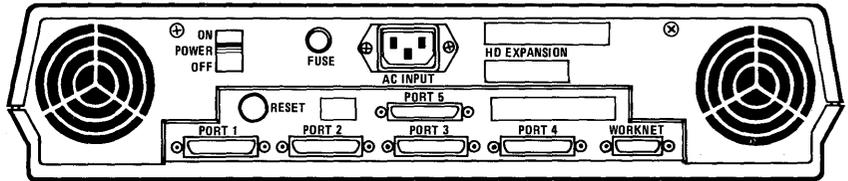
Figure 3-1. Serial Ports on the 486 Rear Panel

To run the Serial Port tests, select C from the
Diagnostics Menu. The screen displays the Serial
Port Main Menu:

```
    *** Intelligent Serial Channel Verification nx.x***

    Serial Port Main Menu

    (A) Select Terminal Port      (E) Serial Channel single pass
    (B) Echo Test                 (F) Serial Channel long loop
    (C) Barber Pole Test          (G) Return to Main Menu
    (D) Serial Memory Verification

    Enter:
```

MENU
DESCRIPTIONS

Here is a brief description of the Serial Port diagnostic programs. Individual sections containing instructions for running each program follow.

A. Select Terminal Port allows you to select a port to be tested.

B. Echo Test verifies that the keys you type on the keyboard appear on the terminal screen as typed.

C. Barber Pole Test verifies that output to individual ports is being transmitted.

D. Serial Memory Verification tests the memory of the Serial CPU.

E. Serial Channel single pass verifies the receiving and transmitting of information over the serial channel. This test requires a loopback connector. (See Appendix B for details.)

F. Serial Channel long loop verifies the receiving and transmitting of information over the serial channel. Running multiple passes more thoroughly tests the Serial Channel. This test requires a loopback connector. (See Appendix B for details.)

G. Return to Main Menu exits the Serial Port Main Menu and returns you to the Main Diagnostic Menu.

These tests can be separated into two categories:

o   You can do a basic test of your system's serial port by running the Echo Test, Barber Pole Test, and Serial Memory Verification.

o   You can thoroughly test your system's serial port by running the basic tests and the Serial Channel tests which require a loopback connector.

     You need to run these thorough tests only if you experience trouble with equipment connected to a serial port.

SELECT TERMINAL
PORT

Before running any of the Serial Port tests, you must specify which port to test. Select **A**. The screen displays:

```
Terminal Port Selection Menu

(A)  Port 1          (D)  Port 4
(B)  Port 2          (E)  Port 5
(C)  Port 3

Enter:
```

Select **A** to test Port 1 first. If the console port (Port 1) does not work properly, none of the other ports can be verified.

The screen displays:

```
Connect a Display Terminal to Port 1
Test will continue on Port 1
```

After connecting a display terminal, you are ready to select a test. The screen of the terminal attached to the selected port displays:

```
Serial Port Main Menu

(A) Select Terminal Port        (E) Serial Channel single pass
(B) Echo Test                   (F) Serial Channel long pass
(C) Barber Pole Test            (G) Return to Main Menu
(D) Serial Memory Verification

Enter:
```

You can test each port in the same manner as Port 1. If only one terminal is available, the test sequence is:

1. Select the port to be tested from the Terminal Port Selection Menu. For this example, Port 2 is used. The screen displays:

Connect a Display Terminal to Port 2
Test will continue on Port 2

2. Disconnect the terminal cable from the connector at the rear of the system labeled port 1 and reconnect it to the port 2 connector.

    When the cable is connected, the Serial Port Main Menu appears.

3. Select the desired test from the menu.

ECHO TEST

Select B from the Serial Port Main Menu to begin the Echo Test.

During this test, press any series of keys. The corresponding keyboard characters should appear or "echo" on the screen of the terminal attached to the chosen port.

If the corresponding characters do not appear on the screen, check to see that the terminal is connected to the port that was selected.

If the keyboard characters still do not appear on the screen, contact authorized personnel or your dealer.

To stop this test and return to the Serial Port Main Menu, press <ESC>.

BARBER POLE   Select C from the Serial Port Main Menu
TEST   to begin the Barber Pole test.

                     A continuous barber-pole like diagonal pattern
                     of keyboard characters appear on the screen of
                     the terminal selected.

                     If the diagonal pattern does not appear on the
                     screen, or if an irregular pattern appears, check
                     to see that the terminal is connected to the port
                     that was selected.

                     If the pattern still does not appear on the screen,
                     contact authorized personnel or your dealer.

                     To stop this test and return to the Serial Port
                     Main Menu, press <ESC>.

SERIAL MEMORY   To run the Serial Memory Verification, select
VERIFICATION   D from the Serial Port Main Menu.   The
                     screen displays:

                          To continue, press any key...

                     After pressing a key, the screen displays a
                     message that the test passed and returns to the
                     Serial Port Main Menu.

                     If the test passed message does not appear, contact
                     authorized personnel or your local dealer.

SERIAL CHANNEL
SINGLE PASS

To run a single pass of the Serial Channel test on any port 2 through 5, select E from the Serial Port Main Menu. The screen displays:

```
This test requires a loopback connector on the port.
Press <CR> when ready to begin or <ESC> to return to the menu...

Terminal Port To Test

(A) Port 1          (D) Port 4
(B) Port 2          (E) Port 5
(C) Port 3
Enter:
```

This test requires a loopback connector. See Appendix B for details.

The loopback connector must be attached to the port being tested. For example, to test Port 2, attach the terminal cable to Port 1 and attach the loopback connector to Port 2. Then select B.

If you attach the loopback connector to the proper port, the screen displays:

```
      Wait 15 seconds, press any key...
```

Be sure to wait 15 seconds before pressing any key. Any key pressed while the test is running is ignored.

After pressing a key, the screen displays a test passed message and returns to the Serial Port Main Menu.

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If you select the port your terminal is connected
to, the screen displays:

> Invalid Entry! Please try again.
>
> You may not select the port you are using!

and returns to the Serial Port Main Menu. You can
not select the port your terminal is connected to.
Reselect the port.

If the screen displays a message such as:

> No character read
> Number of occurances : 1
> DTR won't go high
> Number of occurances : 1
> Overrun incorrect
> Number of occurances : 1
> No break generated
> Number of occurances : 1

check to see that the connector is constructed
properly and that it is attached to the correct
terminal port. Then retry the test.

If the test passed message does not appear, contact
authorized personnel or your local dealer.

To run the Serial Channel test on Port 1, follow
these steps:

1. From the Serial Port Main Menu, select A,
    Select Terminal Port.

2. From the Terminal Port Selection Menu, select
    B and connect the terminal cable to Port 2.

3. The program returns to the Serial Port Main
    Menu. Select **E** to run the Serial Channel
    test.

4. Connect the loopback connector to Port 1 and
    press <CR> to begin the test.

5. The screen displays the Terminal Port To Test
    menu. Select **A** to test Port 1. The screen
    displays:

Wait 15 seconds, press any key...

If your screen displays another message, return
to the section "Select Terminal Port," and repeat
the above steps.

SERIAL CHANNEL   To run the Serial Channel long pass test, follow
LONG PASS   the instructions for running the Serial Channel
                        single pass. Once the test begins, the screen
                        displays:

Wait 45 seconds, press any key...

You must wait 45 seconds before pressing a key to
allow for multiple passes of the test.

SYSTEM TEST The System test provides an overall test of three
major areas:

o   The hard disk drive

o   The floppy disk drive

o   The memory

The test takes approximately 30 minutes to complete
per pass. During each pass, the floppy disk is first
formatted, then verified as the system's disk drive
and memory are simultaneously tested.

Because this test destroys all data on a floppy
disk, you will need a scratch diskette for this
program.

A scratch diskette is a diskette that does not
contain any valuable information. It can be a new
disk or one that contains data you no longer need.

                        CAUTION

     Unless instructed to do so, do NOT include
     the hard disk in the system test. If you
     include the hard disk in the test, any data
     contained on that disk will be destroyed.

Due to the length of the test, (30 minutes per pass),
you do not need to constantly watch the screen. Once
you have set up the test, the program automatically
checks the system for you and informs you of the
results.

To run the System Test, select **D** from the Serial
Port Main Menu. The screen displays:

```
   System Verification Test   nn.n


   (A) Run test
   (B) Return to Main Menu

   Enter:
```

Select **A.** The screen displays:

```
    (A) Hard Disk - Drive 0
    (B) Hard Disk - Drive 1
    Enter:
```

To test the built-in hard disk, select **A.** To test
a hard disk that is added on, select **B.** The
screen displays:

```
    Press <ESC> to quit program in progress

    This test will destroy the present contents of the hard disk.
    Do you want to include the hard disk in the test? (y or n)
```

Unless otherwise instructed by authorized
personnel or your local dealer, you should
always select **N** as a response to this
question. The screen displays:

```
    Each pass takes approximately 30 minutes to finish.
    Insert a scratch diskette in floppy drive and press <CR> to begin
```

In the remainder of the System Test this section,
screen displays and responses are presented in two
sets. One set shows the screen displays if the hard
disk is **NOT** included in the System Test; the other
shows the screen displays if the hard disk is included
in the test.

SYSTEM TEST WITH
HARD DISK NOT
INCLUDED

After you insert the scratch diskette and press
<CR>, the screen displays:

```
    Pass count = 1. Press <ESC> to stop.
    Formatting floppy disk.
    Cylinder: nn   Head: n



```

You should allow the system test to complete at
least one pass before terminating the test. Watch
for the pass count to change to 2. If you press
<ESC> before pass 1 is completed, the screen displays:

```


    Operation stopped



```

The System Test first formats the floppy disk.
After this process is finished, the screen
displays:

```


    Floppy Format completed.
    Verifying floppy disk data.
    Cylinder: nn   Head: n


```

The program verifies the data by counting through
the 80 cylinders and the number 0 and 1 heads. After
the verifying process is completed the screen displays:

```
Data verification completed.


Pass count = 2. Press <ESC> to stop.
Formatting floppy disk.
Format completed.
Verifying floppy disk data.
Cylinder: nnn    Head: n
```

Note the pass count change. If you wish, you may
now press <ESC> to check the results of the
test. The screen displays a System Test passed
message.

If the system encounters a problem during the test,
the screen displays a System Test failed message.
You should contact authorized personnel or your dealer.

After the test is completed, the screen displays
the System Verification Menu. Select A to run the
test again. Select B to return to the Main
Diagnostic Menu.

SYSTEM TEST   CAUTION
WITH
HARD DISK   Running the system test with the hard disk
INCLUDED   included WILL DESTROY the contents of the
                 hard disk.

After you insert the scratch diskette and
press <CR>, the screen displays:

```
    Pass count = 1. Press <ESC> to stop.
    Formatting floppy disk.
    Cylinder: nnn   Head: n
```

The program formats the floppy disk.   The screen
displays:

```
    Floppy Format completed.
    Verifying hard and floppy disk data.
    Cylinder: nnn   Head:  n
```

When the verification process is complete, the
screen displays:

```
    Data verification completed
    Testing the hysteresis of the hard disk.
    Cylinder:  nnn
```

The system then tests the hysteresis, or head
positioning, of the hard disk. The screen
displays:

**Verifying the remainder of the hard disk.
Cylinder: nnn   Head: n**

You should allow the system test to complete at
least one pass before terminating the test. Watch
for the pass count to change to 2. If you press <ESC>
before one pass is completed, the screen displays:

Operation stopped

Press <ESC> any time after one pass is complete
to stop the test. If the test is successful, the
screen displays a System Test passed message.

If the system encounters a problem during the
test, the screen displays a System Test Failed
message. You should inform authorized personnel
or your dealer.

After the test is completed, the screen displays
the System Verification Menu. Select **A** to run the
test again. Select **B** to return to the Main
Diagnostic Menu.

**WORKNET
LOOPBACK**
This test checks the WorkNet interface of your system.

The program transmits test patterns of data through
the WorkNet channel which is then "looped back"
(received back) into the system. The data is then
compared to check if the test patterns transmitted
match the test patterns received.

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No external loopback cable is required for this test.
Disconnect the WorkNet cable (if connected) before
running the test.

To run the WorkNet Loopback test, select E from
the Main Diagnostics Menu. The screen displays:

```
Worknet Loopback Test  nn.n

(A) Single Pass
(B) Contiuous Loop
(C) Return to Main Menu

Disconnect the worknet cable (if connected) before running the test

Enter:
```

If a WorkNet cable is attached to your system,
disconnect it prior to running this test.

Select A to run a single pass of the test.
The program compares the data transmitted
with the data received. If they are the same,
the screen displays a message that the Worknet
test passed.

If the data transmitted and received are different,
The screen displays a message that the WorkNet test
failed. You should inform authorized personnel or
your dealer.

Select B to run a continuous loop. A continuous
loop test the WorkNet interface more thoroughly. This
test runs until you stop it by pressing <ESC>.
The screen displays:

```
Press <ESC> to quit


Pass nnn
```

The pass number indicates how many passes have been executed. When the test is stopped, either the error report (if there are any errors) is displayed, or the screen displays:

```
    Pass nnn
    Worknet test passed
```

To return to the Diagnostics Menu, select C.

Be sure to reconnect the WorkNet cable if you disconnected it to run this test.

RETURN TO
MAIN MENU

To leave the Diagnostics Menu and return to the Main Diagnostic Menu, select F.

Appendix **A**
Error Messages

CONTENTS

The following describes error messages that you may encounter when running the SDX programs.

If you encounter one of these error messages, follow these steps:

1. Note when the problem occurred. For example, "error came up after running System Verification test."

2. Return to the Main Diagnostic Menu, re-boot if necessary, and attempt to run the program again to verify that the problem is an actual one.

3. If the error message appears again, inform authorized personnel or your dealer.

FLOPPY FORMAT ERROR MESSAGES

Floppy drive not ready; Format aborted. – The floppy controller reports not ready status. Ensure diskette is inserted properly and the door is closed.

Diskette is write protected; Format aborted. – The floppy controller reports that the diskette has a write protect tab. To continue, remove write protect tab.

Format error; Format aborted. – Any error not handled above, including cyclic redundancy check, (CRC) and record not found (RNF).

Verify error; Format aborted. – An error was encountered during verification.

FLOPPY COPY ERROR MESSAGES

Floppy drive not ready; Operation aborted. - May appear during either write or read phase when the floppy controller is not in a ready state.

Diskette is write protected; Operation aborted. - During the write phase the controller reports that the diskette has a write protect tab. To continue, remove the write protect tab.

Read error; Operation aborted. - Any error other than not ready, including CRC and record not found.

Write error; Operation aborted. - Any error other than write protect drive not ready, including CRC and record not found.

HARD DISK FORMAT ERROR MESSAGE

Format error - The hard disk drive is inoperable and cannot format the disk.

FLAG BAD SECTOR ERROR MESSAGE

Unable to flag bad sector - The program was not able to flag a bad sector because the hard disk drive is inoperable.

SERIAL PORT ERROR MESSAGE

Checksum error - The calculated ROM checksum doesn't agree with the value stored in the ROM itself.

Data buss error - A RAM data line may be open or shorted.

Address buss error - A RAM address line may be open or shorted.

No character read - The test sent a character and didn't receive one.

Even parity failed - A parity error resulted while the Serial Channel was set for "Even" parity.

Odd parity failed - A parity error resulted while the Serial Channel was set for "Odd" parity.

No overrun forced - The receive buffer was overrun but no error was generated.

A-3

Overrun incorrect – The receive buffer was overrun properly during the test but the last character received was not the one expected.

DTR won't go low – Unable to lower the Data Terminal Ready hardware handshake line.

DTR won't go high – Unable to raise the Data Terminal Ready hardware handshake line.

CTS won't go low – Unable to lower the Clear To Send hardware handshake line.

CTS won't go high – Unable to raise the Clear To Send hardware handshake line.

No break generated – Unable to generate a "Break" signal or the signal generated was not correctly interpreted by the receiving end.

No framing error – The framing error is generated as part of the "Break" generation procedure. This error message means the receiving end didn't detect it.

Couldn't clear break – The error clearing process of the particular channel under test failed while trying to clear the "Break" condition.

Unable to transmit – The transmit buffer empty (TXBE) bit is stuck so that the transmitter believes the receiver isn't ready and the test has tried to send another character.

Unexpected char rcvd – Each character sent by the transmitter is received and read. The receiver got something other than what it expected.

Timer0 failed – The baud rate generator for ports 1-3 failed.

Timer1 failed – The baud rate generator for ports 4 and 5 failed.

Appendix **B**
Constructing a Loopback Connector

CONTENTS

**WHAT IS A
LOOPBACK
CONNECTOR?**

A loopback connector is a modified connector that
you attach to a port. It channels the computer's
input and output.

A loopback connector is required to run the Serial
Channel tests. These tests are part of the Serial
Port tests.

You can run serial port tests that do not require
a loopback connector and will adequately test the
serial ports.

If you suspect a problem with a serial port, it is
recommended that you construct a loopback connector
and run the Serial Channel test to more thoroughly
check the serial ports.

**CONSTRUCTING
A LOOPBACK
CONNECTOR.**

To construct a loopback connector, you need
an RS232 male connector (also called a 25-pin
D-type connector).

You must connect certain pins, also called lines,
on the connector either by soldering or wrapping
the pins with wire.

The pins that you connect are:

o   Pin 2, Transmit Data (TXD), and pin 3,
     Receive Data (RXD).

o   Pin 4, Request to Send (RTS), and pin 5,
     Clear to Send (CTS).

o   Pin 6, Data Set Ready (DSR), and pin 20,
     Data Terminal Ready (DTR).

The following illustration shows an RS232
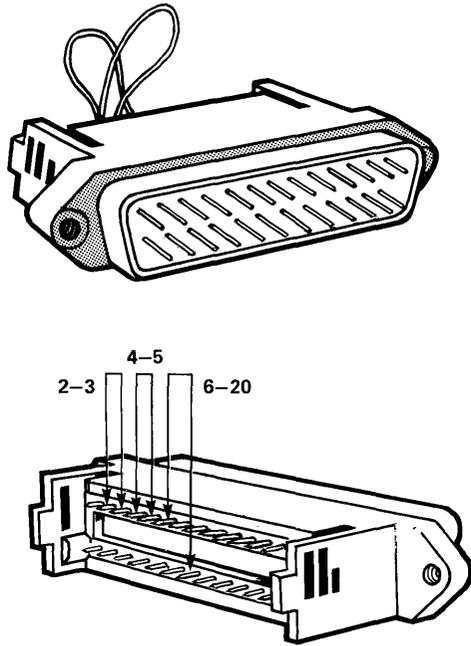connector and the pins that you must connect.

Figure B-1.   A Loopback Connector

After constructing a loopback connector, attach
it to the port you wish to test with the Serial
Channel test.   See the section "Serial Port" in
Chapter 3 for instructions.

You must specifiy which hard disk to test. Select
A and press <CR> to test the built-in disk.
Select B and press <CR> to test an added
hard disk.

After pressing <CR>, the screen displays:

```


    Recalibrating



```

NOTE

This message usually appears on the screen
briefly, then disappears. Do not be alarmed
if it doesn't appear on your screen.

Next, the screen displays:

```


    Cyl: nnn    Hd: n


```

The program reads through the cylinders and heads,
then lists these as they are checked. One complete
pass reads all cylinders and takes about four minutes.

At the end of a complete pass, or after you press
<ESC>, the screen displays the status of the
sectors checked up to that point.

If no flagged sectors were detected, the screen
displays:

```
**** Summary ****

No flagged sectors were detected.

Do you wish to run this program again? (y or n)
```

If you select Y, the system will run the program
again. If you select N, the program returns to
the Main Diagnostic menu.

If flagged sector(s) were found, then the screen
displays:

```
**** Summary ****
Found nn flagged sectors on this disk.


   Cylinder            Head            Sector
      nnn                n               nn


Press <CR> to continue.
```

NOTE

The program displays up to 40 flagged
bad sectors. If there are more than
40, the remainder will not be displayed.

Press <CR> to continue and the following message
appears:

Do you wish to run this program again? (y or n)

If you select Y, the program runs again. If
you select N, the program returns to the Main
Diagnostic menu.

**HARD DISK
FLAG BAD
SECTOR**

This program flags known bad sectors on the hard
disk so that they will not be used for storing
data.

Each system is tested before it is shipped from the
factory, and any known bad sectors are flagged at
that time.

The Hard Disk Flag Bad Sector program should be
used only if a bad spot develops on the disk, or
to re-flag known bad sectors after reformatting the
hard disk.

A Hard Disk Error Map (also called a Media Defect
Report) is attached to the hard disk in you 486
system. This map shows flagged bad sectors by
track, head, byte count, and length in bits.

Refer to this map only to flag sectors after
reformatting the hard disk or to verify that
all bad sectors have been flagged.

CAUTION

After you begin to enter data into your
system, do not use this program to set
additional bad sector flags, unless you
have a backup of your files.

Once you have flagged a sector as bad, the
system will stop accessing that particular
sector. Any data located in that sector
is lost.

You will usually have to reinstall your
operating system after flagging additional
bad sectors.

Follow these instructions to run the Hard Disk
Flag Bad Sector program.

Select B from the Utilities Menu. The screen
displays:

```
Hard Disk Flag Bad Sector Routine  nn.n
     (enter information, follow by <CR>)

Drive (0 or 1):
Enter Cylinder Number (1 - 305):
Enter Head Number (0 - 3):
Enter Sector Number (0 - 15), or <CR> to skip:
Enter bytes from index (in dec), or <CR> to skip:
Enter bytes from index (in hex):

recalibrating
Flagging bad sector on cyl nn, hd nn, sect nn
```

NOTE

The recalibrating message usually appears on
the screen briefly, then disappears. Do not
be alarmed if it doesn't appear on your screen.

READER COMMENT FORM

Altos Computer Systems
2641 Orchard Parkway
San Jose, CA 95134

This document has been prepared for use with your Altos Computer
System. Should you find any errors or problems in the manual, or
have any suggestions for improvement, please return this form to
the ALTOS PUBLICATIONS DEPARTMENT.   Do include page numbers or
section numbers, where applicable.

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Name_____

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