SST™
Owner's Manual

FASST™
WESTERN DIGITAL
SCSI Solutions

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Table of Contents

Try our new, easy "thumb" index for quick look-ups !

Glossary of Common Acronyms

ANSI - American National Standards Institute - An organization for the development and publication of standards such as bolt threads and computer interfaces.

BIOS - Basic I/O Services - The instructions that teach the system or subsystem how to use I/O devices like disks, the monitor, keyboard etc. System BIOS is often in ROM form.

BUS - the physical channel(s) through which all data goes into or out (I/O) of RAM or the CPU.

BUS MASTER - A specialized CPU that operates as an I/O Co-Processor. A Bus Master will "turn off" the computer's CPU in order to directly control the I/O bus for a data transfer then turn the computer's CPU back on when finished.

CPU - Central Processing Unit - The "intelligent" chip that runs a computer system or subsystem; i.e., INTEL 80286 or 80386.

DASD - Direct Access Storage Device - For all intents and purposes, a hard drive.

DDI/O - Demand Driven I/O - A high performance variation of PI/O

DMA - Direct Memory Access - A technique/mechanism for I/O that passes data directly from the source to the target, without CPU intervention.

I/O - Input/Output - General term for the methods and mechanisms for moving data into and out of a system or sub-system.

PI/O - Programmed I/O - A technique/mechanism for moving data between RAM and a controler, via the CPU.

RAM - Random Access Memory - the memory chips in your computer.

ROM - Read Only Memory - "Permanent" memory mostly used for starting a computer or controlling special devices.

SBIC - SCSI Bus Interface Controller - The "switchboard" that controls the SCSI bus.

SCSI - Small Computer System Interface - A standard access standard for computer peripherals defined by the ANSI committee in 1986 X3.131-1986

SDLP - Standard Device Level Protocol - Columbia Data Products, Inc.'s proposed standard BIOS services for computer peripherals, commonly used in reference to CDP's programmers interface documentation.

SST - Standard System Technology - Trademark of Columbia Data Products, Inc. SCSI implementation of the SDLP architecture for drivers, utilities and applications.

WHAT'S NEW FOR 3.36...

WINDOWS v3.0 SUPPORT

SST software fully supports Microsoft's new WINDOWS v3.0, even without loading any RAM drivers! But, with all the RAM WINDOWS v3.0 makes available, you won't want to pass up the speed gain of using our RAM drivers anyway.

CERTIFIED NETWARE 286 & 386 SUPPORT

Our Netware/286 driver, SST_DRVR.OBJ, has been Novell Certified, #D-91, on an NCR 925 for Netware Advanced & SFT v2.15 rev. c. Our Netware/386 driver, SDLPDRVR.DSK, has been Novell Certified, #D-90, on an NCR 925 for Netware v3.0.

ATXT SUPPORT FOR OS/2

The WDATXT-FASST card is now supported under OS/2 operating system.

OS/2 v1.2 SUPPORT

The SST drivers now support IBM and MS OS/2 v1.2 for either the standard FAT or the new High Performance File System (HPFS). You may create and use a single, bootable OS/2 v1.2 partition.

SSTBIO.SYS RETURNS TOP 1K TO MEMORY ALLOCATION CHAIN

The top 1K of system base RAM is now automatically returned to the DOS memory allocation chain facilitating the use of DOS "extenders" and other "high loading" utilities.

NETWARE 286 ADVANCED OR SFT NON-DEDICATED SUPPORT

Netware 286 v2.1x Advanced or SFT Non-Dedicated Mode is now supported. SSTBIO.SYS **must** be loaded in the DOS CONFIG.SYS file.

SCSI FORMATTER UTILITY

SSTFMAT.EXE is a new utility allowing the physical formating of SCSI DASD devices (hard drives), including selection of physical sector size (i.e., 512 bytes) and restoration of automatic error reallocation space.

SST DRIVERS WILL LOAD INTO DOS HIGH MEMORY

SST software now supports the Microsoft/IBM VDS (Virtual DMA Services) standard, allowing the loading of all or part of the SST drivers in high memory in VDS-compliant environments such as 386-to-the-MAX v4.08 Professional, or QEMM v5.

VERBOSE SSTBIO.SYS OPTION

A new configuration switch, /V, will display a complete breakdown of the memory used by the SST system drivers and the configuration options active.

SSTDRIVE.SYS OPTIONS

The new switch, /E, will suppress error messages from SSTDRIVE.SYS, allowing Unix/Xenix OEM mode and other "uninitialized" disks to be on the bus and still have access to multiple SST DOS partitions.
For removable media operations, two new switches have been added: /R:X will allows you to choose how many drive letters to allocate for removable devices.; /S:X allows you to enter the maximum logical sector size, between 512 byte and 8K.

BUS ON/OFF TIMING CONTROL

A new program, BUSONOFF.EXE, will allow you to optimize your bus on/off times for the 7000-FASST2 card.

ENHANCED DISK AND PARTITION MANAGEMENT

A new utility, SSTUTIL.EXE, offers partition and disk management services for SST systems, including high speed disk-to-disk and partition-to-partition copies.

AUDIO.COM NOW SUPPORTS THE TOSHIBA/IBM CD-ROM PLAYER

You may now play music on your Toshiba/IBM CD Player.

Radio Frequency Interference Statement

This Western Digital product has been certified to comply with the limits for a Class B computing device pursuant to subpart J of Part 15 of FCC rules. This does not guarantee that interference will not occur in individual installations. Western Digital is not responsible for any television, radio, or other interference caused by modifications of this product.

If interference problems do occur, please consult the system equipment owner's manual for suggestions. Some of these suggestions include relocation of the computer system away from the television or radio or placing the computer AC power connection on a different circuit or outlet.

The product was tested and certified with a shielded interconnecting cable; therefore, a shielded cable is required to be used with this product.

This digital apparatus does not exceed the Class A (B) limits for radio noise for digital apparatus as set out in the Radio Interference Regulations of the Canadian Department of Communications.

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CHAPTER 1:
7000-FASST2
SPECIFICATIONS AND
JUMPER SETTINGS

The features of the 7000-FASST2 ultra high-speed SCSI controller are:

- Supports up to seven devices on a single controller card - up to fourteen on two controllers!
- Intelligent Z-80 CPU channel control
- Built-in floppy disk controller
- WD33C93A SBIC for SCSI interface
- First-party high-speed bus-mastering DMA data transfers
- Up to 16-megabyte block-size transfers
- 16-byte FIFO on AT bus for sustained data rate performance
- Up to 4.0 megabytes per second SCSI synchronous data transfer rate
- Up to 2.0 megabytes per second SCSI asynchronous data transfer rate
- Up to 5.3 megabyte per second host transfer rate
- Bus arbitration including disconnect and reconnect
- Standard and extended SCSI commands
- Supports full SCSI command set (SCSI I & II)
- Single +5V power supply
- On-board controller diagnostics
- AT® card form factor
- Supports up to 64 logical devices
- Linked SCSI commands

The 7000-FASST2 controller general specifications are as follows:

FORM FACTOR:............................IBM PC-AT ®

LENGTH: ....13.1 INCHES (33.27 CENTIMETERS)

HEIGHT:...4.75 INCHES (12.04 CENTIMETERS)

WIDTH: ....0.50 INCHES (1.27 CENTIMETERS)

VOLTAGE:.......................................+5VDC +-5%

CURRENT: ....2.0 AMPS MAX, 1.8 AMPS TYPICAL

HOST TRANSFER RATE:............5.3 MBYTE/SEC

SCSI TRANSFER RATE:...............4.0 MBYTE/SEC SYNCHRONOUS
....2.0 MBYTE/SEC ASYNCHRONOUS

LCPU CLOCK (Z-80): ....8 MHZ

SBIC CLOCK (WD33C93A): ....16 MHZ

SELECTION TIME OUT:..............250 ms

LOGICAL THREADS:...................16

AT BUS ON/OFF TIME:...............PROGRAMMABLE

MEAN TIME BEFORE FAILURE:100,000 HOURS

MEAN TIME TO REPAIR:...........30 MINUTES

HOST INTERFACE:.......................16 BIT, BI-DIRECTIONAL AT BUS
....62 PIN CARD EDGE CONNECTOR
....38 PIN CARD EDGE CONNECTOR

SCSI INTERFACE:.........................9 BIT, BI-DIRECTIONAL SCSI BUS
....50 PIN SCSI CONNECTOR
....INTERNAL - 50 PIN HEADER
....EXTERNAL - 50 PIN D STYLE
....20 FT. MAX (6 METERS) DRIVE CABLE

AMBIENT TEMPERATURE:...... 0 DEGREES C (32 °F)
.... 55 DEGREES C (131 °F)

RELATIVE HUMIDITY: .... 10% TO 95% NON-CONDENSING

AIR FLOW:....................................... 100 LIN FT/MIN. AT 0.5" FROM
.... COMPONENT SURFACE

ALTITUDE:...................................... 10,000 FT MAX (OPERATING)
.... 15,000 FT MAX (STORAGE)

DRQ ADDRESS: 6

DACK ADDRESS:............................ 6

IRQ ADDRESS: 15

I/O PORT ADDRESS: 350h

BIOS ROM ADDRESS:................. Variable (C800h - DC00h See page 1-6)

BIOS RAM USAGE: .... Top 1K of system RAM if boot*

MOTOR START:............................. Don't Care

PARITY:... Don't Care

   * Returned by SSTBIO.SYS

All user configurable jumper settings are listed on the following pages.

7000-FASST2 CARD

Drive Light
Connector Pin 1

W200 W201

WD Z-80
Firmware

Floppy Drive Connector
Pin 1

CDP ROM   W6 W9 W5

SCSI Cable Connector
Pin 1 / (Internal)

Fuse

W100

Spare Fuse

Terminating Resistors

W2

W3 W1 W4 W99 W98

OEM Hardware Testpoint

External SCSI Cable
Connector

▪	Jumper Installed
▯	Jumper Not Installed
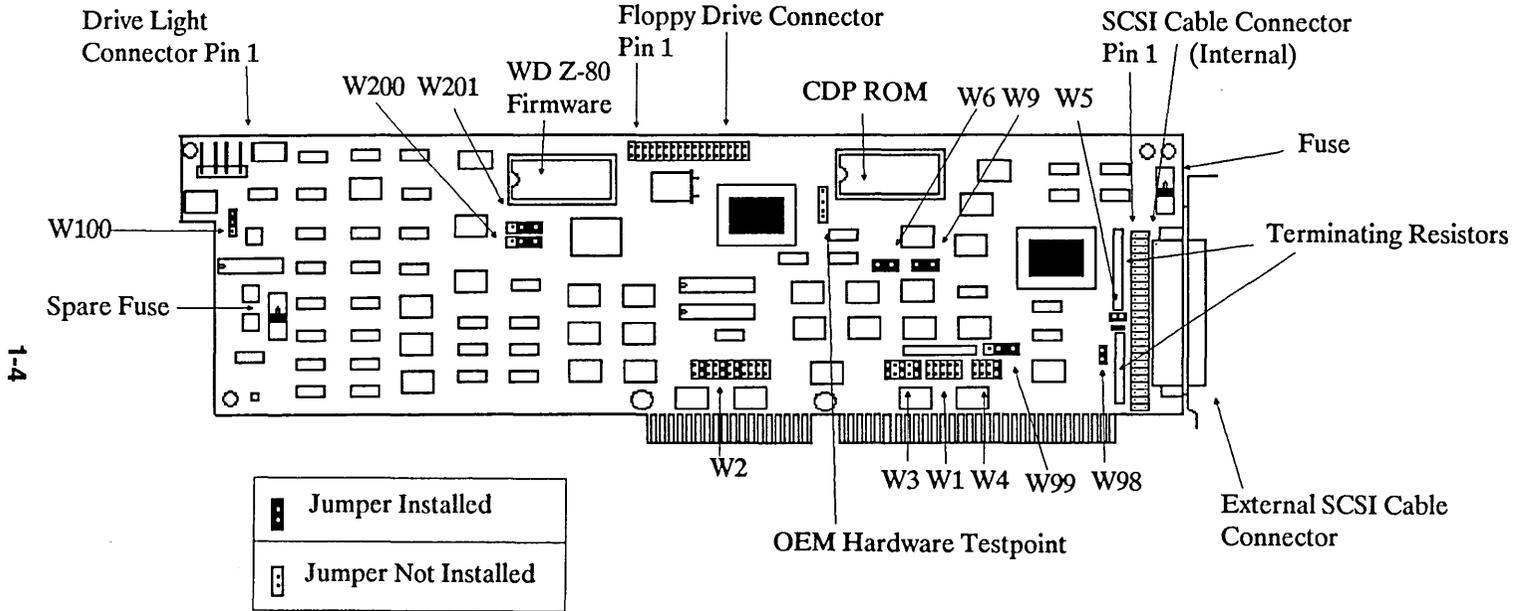
7000-FASST2 Jumper Fields

❉ W1 - IRQ Select for 3 through 9 -Not used.

❉ W2 - Jumpers 1 - 6: DMA Channel 5 through 7 - Illustrated as DMA 6; Jumpers 7 - 11: IRQ Select for 10 through 15 - Illustrated as IRQ 15.

❉ W3 - I/O Port Address - Illustrated as 350h.

W4 - ROM BIOS Address - Illustrated as CE000h - See Page 1-7 for options.

❉ W5 - Termination Power - Illustrated as Host Supplies Termination Power.

W6 & W9 - **Floppy Connector:** If the floppy cable is connected to the 7000 Card, remove the jumpers from W6 & W9. If the floppy cable is not connected, make sure both W6 & W9 are jumpered.

W98 - BIOS Enable/Disable - MUST be jumpered except on a second 7000 card.

❉ W99 - ROM Size - MUST be jumpered across 2 & 3 for 8Kx8 ROM.

❉ W100 - Reserved - MUST be jumpered across 1 & 2.

W200 & W201 - Floppy Drive Type - When jumpered across pins 2 & 3, an AT/ANSI-type floppy drive is supported. When jumpered across pins 1 & 2, "High Speed" PS/2-type floppy drives are supported. W200 selects drive type for the first floppy drive. W201 selects drive type for the second floppy drive. If you are unsure about what type of floppy drive you have, assume that you have AT/ANSI-type drives.

> **NOTE: The WD-7000-FASST as illustrated in this manual is the latest production version of the board. Older production boards will not have jumpers W98 through W201 and jumpers W6 & W9 are not next to each other. W9 is located where it is illustrated on the previous page. W6 will be a little below and to the right of its location. The older boards also do not have either the replaceable fuse or the spare fuse.**

❉ NOTE: Jumper fields marked with an asterisk are NOT user configurable. If the jumpering of marked fields is changed, the card will not function.

The following are the various ROM addresses where the Columbia Data Products, Inc. 7000-FASST2 BIOS ROM may reside. The address jumper is W4.

W4

C800h   D000h   D800h

CA00h   D200h   DA00h

CC00h   D400h   DC00h

CE00h*   D600h
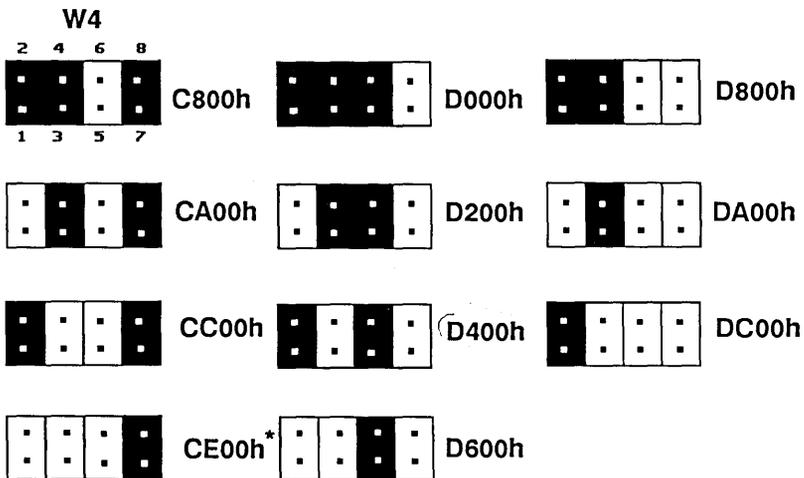
* Default setting for the 7000-FASST2

Multiple Host Adapter Support

The Netware/286, /386 and DOS drivers supplied with v3.36 now support multiple host 7000-FASST2 controllers in the same system. You will notice that a file has been added called WD7000.SYS. This file, when loaded, allows the DOS-based SDLP kernel (SSTBIO.SYS) to communicate with the second 7000-FASST2 that has been added to the system. Consequently, SSTSETUP.EXE can now be used to partition drives connected to the second 7000-FASST2 controller. The parameters required to configure the second controller are as follows:

    I/O ADDRESS = 330h
    DACK/DRQ = 5
    IRQ = 11
    ROM ADDRESS = C800h (This is only a suggestion)

W1 [jumper block]

W2 [jumper block]

W3 [jumper block]

W4 [jumper block]   See page 1-6 for more options

> **The W-98 jumper must be removed from the second controller for proper functionality.The BIOS ROM must be removed on older production 7000-FASST2 cards.**

The WD7000.SYS file **must** be added to the CONFIG.SYS file if the second controller is to be used, **including running SSTSETUP:**

    DEVICE = SSTBIO.SYS
    DEVICE = WD7000.SYS (NOTE:It must be placed here)
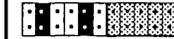   DEVICE = SSTDRIVE.SYS
    . . .

Currently SSTSETUP.EXE does NOT copy WD7000.SYS to the boot drive. This must be done manually!!
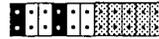
DMA Channel Setting Options - Jumper Block W2

DMA 5	DMA 6*	DMA 7

I/O Channel Setting Options - Jumper Block W1

308h	358h	3A8h
310h	360h	3B0h
318h	368h	3B8h
320h	370h	3C0h
328h	378h	3C8h
330h	380h	
338h	388h	3D0h
340h	390h	3D8h
348h	398h	3E0h
350h*	3A0h	3E8h
		3F0h

IRQ Channel Setting Options

Jumper Block W1

IRQ 3h

IRQ 4h

IRQ 5h

IRQ 7h

IRQ 9h

Jumper Block W2

IRQ 10h

IRQ 11h

IRQ 12h

IRQ 14h

IRQ 15h*

■ Jumper Installed

□ Jumper Not Installed

▨ Jumper Discussed Elsewhere

* Indicates Standard Configuration Setting

NOTICE: These jumper settings are provided as an educational service only. In order to use the FASST card, the fields MUST be set per the settings marked with an asterisk and surrounded by a box or the card WILL NOT WORK

CHAPTER 2:
WDATXT-FASST
SPECIFICATIONS &
JUMPER SETTINGS

The features of the WDATXT-FASST high speed SCSI controller are:

- Supports up to seven hard drives on a single controller card
- WD33C93A SBIC for SCSI interface
- Up to 1.5 megabytes per second SCSI asynchronous data transfer rate
- Up to 650 kilobytes per second host transfer rate
- Standard and extended SCSI commands
- Supports full SCSI command set (SCSI I & II)
- Single 5 + V power supply
- XT® card form factor
- Supports up to 64 logical devices
- Linked SCSI commands

The WDATXT-FASST controller general specifications are as follows:

FORM FACTOR:............................IBM PC-XT ®

LENGTH: ....5.25 INCHES (13.34 CENTIMETERS)

HEIGHT:...4.20 INCHES (10.67 CENTIMETERS)

WIDTH: ....0.50 INCHES (1.27 CENTIMETERS)

VOLTAGE: ....+5VDC +-5%

CURRENT:.....................................2.0 AMPS MAX, 1.8 AMPS TYPICAL

HOST TRANSFER RATE:...........UP TO 650 KBYTE/SEC

SCSI TRANSFER RATE:..............UP TO 1.5 MBYTE/SEC ASYNCHRONOUS

SBIC CLOCK (WD33C93):.............10.0 MHZ

MEAN TIME BEFORE FAILURE:100,000 HRS

MEAN TIME TO REPAIR:..........30 MINUTES

HOST INTERFACE:.......................62 PIN CARD EDGE CONNECTOR

SCSI INTERFACE:.........................9 BIT, BIDIRECTIONAL SCSI BUS
....50 PIN SCSI CONNECTOR
....INTERNAL - 50 PIN HEADER
....EXTERNAL - 50 PIN D STYLE
....20 FT MAX (6 METERS) DRIVE CABLE

AMBIENT TEMPERATURE:......0 DEGREES C (32 °F)
....55 DEGREES C (131 °F)

RELATIVE HUMIDITY: ....10% TO 95% NONCONDENSING

AIR FLOW:.....................................100 LIN FT/MIN. AT 0.5" FROM
....COMPONENT SURFACE

ALTITUDE:....................................10,000 FT MAX (OPERATING)
....15,000 FT MAX (STORAGE)

DRQ ADDRESS: .... Variable (1,3 or none - See page 2-5)

DACK ADDRESS:.......................... Variable (1,3 or none - See page 2-5)

IRQ ADDRESS: .... Variable (See page 2-6)

I/O PORT ADDRESS: 340H

BIOS ROM ADDRESS:................. C800H (default- See page 2-7)

BIOS RAM USAGE: .... Top 1K of system RAM if boot*

MOTOR START: .... Don't Care

PARITY: .... Don't Care

*Returned by SSTBIO.SYS

WDATXT-FASST CONTROLLER CARD

Terminators

Pin 1

W1 W2 W3

W4

☐ Jumper Not Installed

■ Jumper Installed

SCSI Cable Connectors
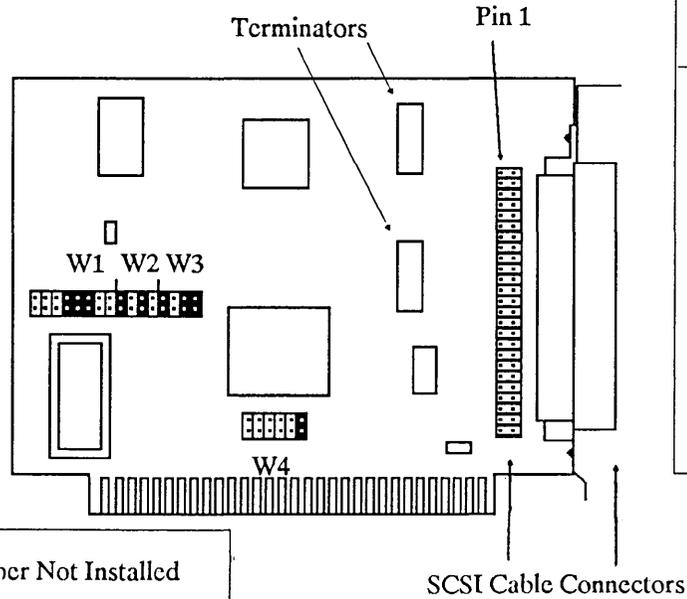
JUMPER FIELD DEFINITIONS

W1 - Multi-Purpose;
see Pages 2-5 and 2-6

W2 - I/O Port Address;
NOT USER CHANGEABLE

W3 - BIOS ROM
Address; see Page 2-7

W4 - Hardware IRQ;
see Page 2-6

Description of WDATXT-FASST Jumper Settings

There are several forms of I/O available on the WDATXT-FASST controller board. These are all user adjustable through the W1 jumper field. The I/O forms are described as follows:

NOTE: HOST DMA mode on channel 3 MUST be selected for use with OS/2.

- Single Byte Programmed I/O - If no jumpers are on the W1 location, then Programmed I/O is in effect. This mode is the most reliable of all and usually no conflicts will arise from its use. Even though this mode is slower than the other modes, it is the best to start with. You can then experiment with the other modes. W1

- Host Direct Memory Address Channel One (DMA 1) - If jumper 1 in the W1 field is jumped, then this mode is in effect. It is faster than Programmed I/O but it sometimes conflicts with other cards in your system, so you may have to use DMA 3, Programmed I/O, or Demand Driven I/O. W1

- Demand Driven I/O (commonly referred to as Blind I/O) - If only jumper 2 in the W1 field is jumped, then Demand Driven I/O is in effect. This is by far the fastest I/O mode. Unfortunately, some drives do not support Demand Driven I/O. If you experience difficulties with this mode, try one of the other I/O modes. If jumper 1 in the W1 field is jumped, jumper 2 is ignored. W1

- Host Direct Memory Address Channel Three (DMA 3) - If jumper 1 and jumper 3 in the W1 field are jumped, then DMA is in operation using channel three. If conflict with another card in your system occurs, try DMA 1, Programmed I/O, or Demand Driven I/O.

Must be selected for use with OS/2 W1
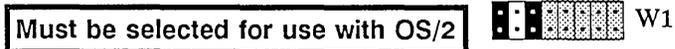
NOTE: Shaded jumpers( ) are described on the next page.

The ATXT-FASST requires a user selectable IRQ setting BETWEEN 2 AND SEVEN (2-7) . You must configure your board to one of the following settings:

> WARNING: IF THE ATXT-FASST IS NOT PROPERLY CONFIGURED, IT WILL NOT WORK. THIS INCLUDES IRQ SETTINGS AS WELL AS DMA MODES!

FOR IRQ 2 THE SETTINGS ARE AS FOLLOWS:

NOTE: IRQ 2 IS NOT AVAILABLE ON AT, 386 OR 486 MACHINES.

W1

W4

(1) (2)

FOR IRQ 3 THE SETTINGS ARE AS FOLLOWS:

W1

W4

FOR IRQ 4 THE SETTINGS ARE AS FOLLOWS:

W1

W4

FOR IRQ 5 THE SETTINGS ARE AS FOLLOWS:

W1

W4

FOR IRQ 6 THE SETTINGS ARE AS FOLLOWS:

W1

W4

FOR IRQ 7 THE SETTINGS ARE AS FOLLOWS:

Must Be selected for use with OS/2

W1

W4

(1) These fields are for DMA mode and are discussed on the previous page.
(2) These fields are reserved.

The following are the various ROM addresses where the Columbia Data Products, Inc.'s WDATXT-FASST BIOS ROM may reside. The address jumper is W3.

W3

C800h*

CC00h

D000h

D400h

D800h

DC00h
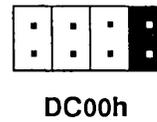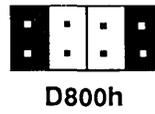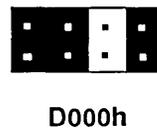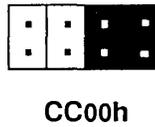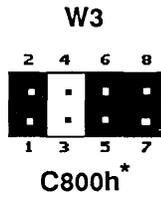
* Default setting for the WDATXT-FASST and most standard XT hard drive controllers.

(NOTES)

CHAPTER 3:

HARDWARE INSTALLATION

This chapter will acquaint you with the FASST controller card, its features, and its capabilities. Also included in this chapter are instructions on how to install the FASST controller card in your computer and how to connect it to your SCSI device(s). Before installing the FASST controller card and SCSI device(s) in your computer,
PLEASE READ THIS SECTION CAREFULLY.

Contents

The FASST Controller Card

The FASST controller card is the heart of the SST system. Its job is to manage all data flowing to and from the SCSI device(s). The card is capable of controlling up to seven SCSI devices and, in the case of the 7000-FASST2 card, two floppy drives. If you already have a hard drive in your computer and wish to ADD a FASST controller card to your system, this is no problem. It will peacefully co-exist with your existing hard drive.

> **WARNING: The FASST controller card is VERY sensitive to static electricity. One shock from touching the FASST controller can permanently damage it. You should discharge yourself by touching the chassis of the computer before touching the card!**

Before installing the FASST controller card in your computer, take it out of the box and familiarize yourself with it. There is a drawing with explanations of each jumper field and connector in Chapter 1 for the 7000-FASST2 card or Chapter 2 for the WDATXT-FASST card to assist you. Go over the jumper settings as illustrated and confirm that the jumpers on your card match.

The WDATXT-FASST has various jumper settings available. You may wish to go through the options in Chapter 2 now before proceeding. In general, however, we recommend that you match the settings on page 2-4 and attempt to get the system up and running before trying the other I/O modes and IRQ channels. **If you are planning to use the WDATXT-FASST card for OS/2, you MUST select either DMA 1 or DMA 3.**

The only user-changeable jumpers on the 7000-FASST2 card are block W-4, ROM BIOS address (alternative settings are illustrated on page 1-6), W-6 & W-9 to activate or de-activate the floppy controller, and W-200 & W-201, which select floppy drive type (which are discussed below). If the jumpers are not set correctly on the 7000-FASST2 card, the system WILL NOT work.

Floppy Controller

The 7000-FASST2 card has a register level compatible on-board floppy controller capable of running your floppy drives. Just as with a regular floppy/hard disk controller for your AT, the 7000-FASST2 on-board floppy controller will operate TWO floppy drives. The WDATXT-FASST has no floppy controller, and this section may be skipped if that is the card you are using.

> **NOTE: You don't have to remove your existing hard drive and controller to use the 7000-FASST2. If you choose to use the 7000-FASST2 in this manner, disable the on-board floppy controller on the 7000-FASST2 by jumping W-6 and W-9.**

If the 7000-FASST2 controller is the ONLY hard disk controller in your computer, and your motherboard does not have an "on-board" floppy controller, you will want to use the on-board floppy controller to run your floppy drive(s). To do this, you will need to remove the jumpers at locations W-6 and W-9 (refer to Diagram One for the jumper locations).

DIAGRAM ONE

Floppy Cable Connector
Pin 1

■ Jumper Installed

Jumper W6   Jumper W9

▯ Jumper Not Installed

7000-FASST2 CONTROLLER
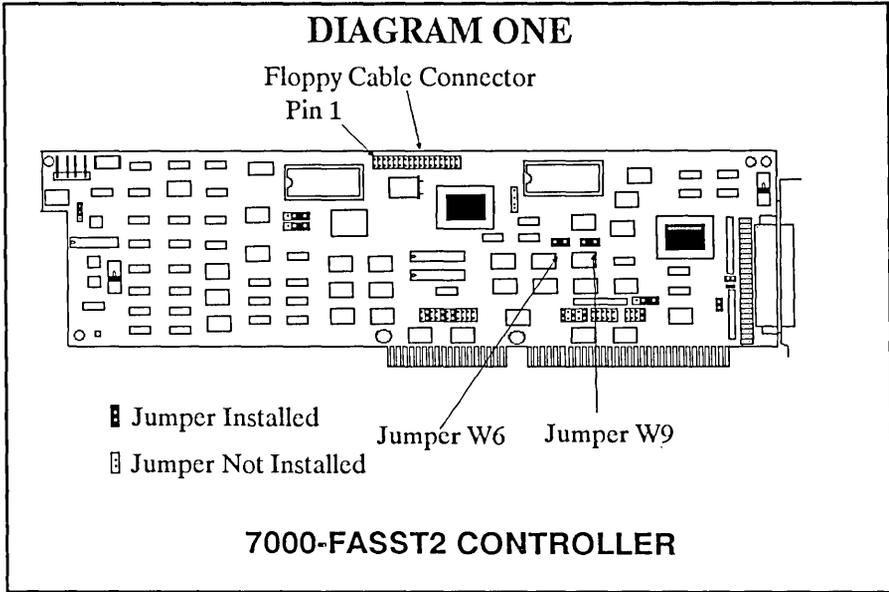
Once you have removed the jumpers at W-6 and W-9, you should examine the floppy cable connector and notice the location of Pin 1. Some floppy cables are keyed (meaning they can only fit on the connector one way) so you don't have to worry about plugging the cable on backwards. For those floppy cables which are NOT keyed, there is usually a colored stripe (blue or red) on one side of the floppy cable. This colored stripe indicates the location of Pin 1 on the cable. Connect the cable with the colored stripe oriented where Pin 1 is marked on Diagram One.

Jumpers W-200 and W-201 allow you to use the new "high speed" PS/2 floppy drives. Jumper W-200 controls floppy drive 1 and W-201 controls floppy drive 2. To use AT/ANSI floppy drives, jumper across the last two of the three pins (2 & 3). To use a PS/2 floppy drive, jumper the first two (1 & 2). If you are unsure about which type of floppy drive you have, you are more likely to have the AT/ANSI-type drive.

Connecting the SCSI Device

The FASST controller usually comes from the factory with the hard drive cable unattached. Refer to Diagram Two, or Three on the next page to locate Pin 1 on the SCSI cable connector. As with the floppy cable, the SCSI cable has a colored stripe to indicate the location of Pin 1. The cable should be

connected to the controller card with the colored stripe oriented where Pin 1 is marked on Diagram Two or Three.

DIAGRAM TWO

Pin 1

SCSI Cable Connectors

7000-FASST2 CONTROLLER

DIAGRAM THREE

Pin 1

⊟ Jumper Not Installed

▪ Jumper Installed   SCSI Cable Connectors

WDATXT-FASST CONTROLLER
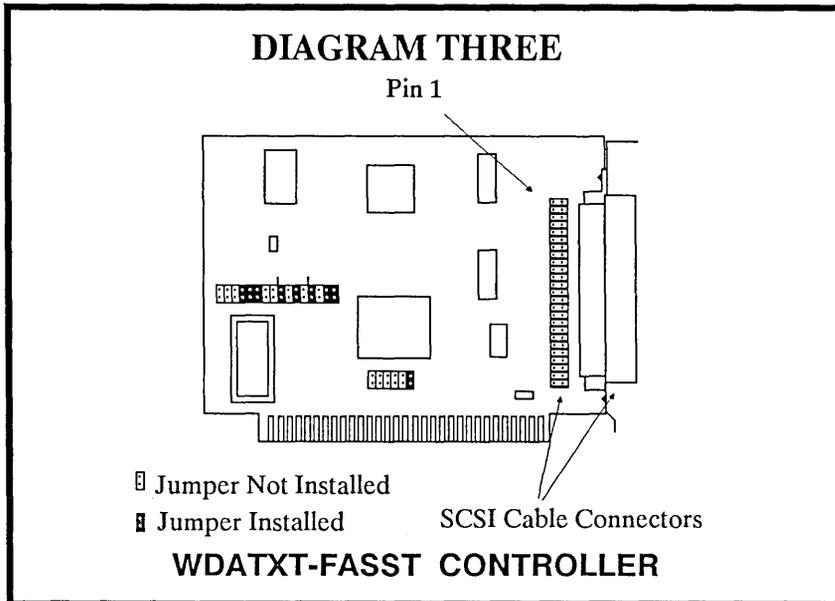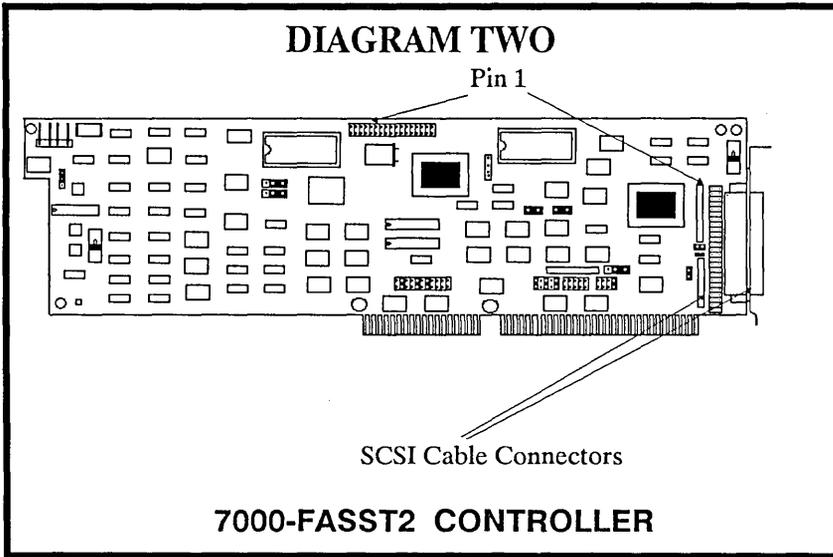
Most SCSI devices used by the FASST controller have keyed connectors and the cable can only be plugged in one way. If, however, the SCSI device

you are connecting to the FASST controller does NOT have a keyed connector, then you MUST pay careful attention to the location of Pin 1.

WARNING: Connecting the SCSI cable incorrectly could result in damage to either the FASST controller or the SCSI device.

When you connect your SCSI device to the FASST controller, pay attention to the proper connection of the cable to the SCSI device. If you are unsure of how to properly connect your SCSI device, consult the manual you received with the SCSI device. It should be able to help you locate Pin 1. If that fails, call your dealer. He should be able to help you. If THAT fails, call Columbia Data Products, Inc. Technical Support for assistance.
DO NOT EXPERIMENT! IF YOU ARE UNSURE, CONTACT SOME-ONE WHO KNOWS!

SCSI Device Termination

WARNING: Improper termination can damage the FASST controller or the SCSI device(s). Pay very close attention to proper termination procedures.

SCSI devices connected to the FASST controller must be properly terminated. Termination lets the FASST controller know the location of the last SCSI device on the cable. If you are ONLY connecting drives internally, or ONLY externally, only ONE SCSI device should be terminated. This SCSI device is usually the last physical device connected to the SCSI cable (i.e. the one farthest from the controller). If you are connecting devices BOTH internally and externally, you must remove the terminators from the FASST card and terminate the farthest physical device on BOTH the internal and external cables. Terminators are usually little ceramic packages with one set of pins or, in some cases, they more closely resemble DRAMs (see Diagram Four for examples).

DIAGRAM FOUR   TERMINATORS

Pin 1 Indicated by Dot
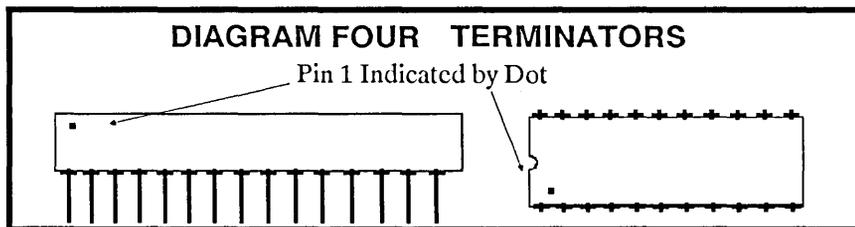
If you have any questions about proper termination or the location of the terminators, consult your SCSI device documentation first, your dealer next, and, if all else fails, contact Columbia Data Products, Inc. Technical Support for assistance.

```
WARNING: If replacing the terminators, pay close attention to
Pin 1. MISTAKES COULD DAMAGE OR DESTROY THE DRIVE.
```

Device SCSI Target ID

Since the FASST controller can handle up to seven devices (i.e., hard drives, etc.) at one time, it must have some method to select the SCSI device with which it wants to communicate. Each SCSI device must be set up with its own Target ID number (0 through 6). The first device must be set to 0, the next 1, and so on.

If you are adding an additional drive to your FASST controller, keep in mind that the next drive you add must be set to the next highest SCSI Target ID number. For example, if you have two hard drives connected and are adding a third, the SCSI Target ID number of the drive you are adding will be 2 (SCSI Target ID 0 is the first SCSI device, SCSI Target ID 1 is the second device, SCSI Target ID 2 is the third, and so on).

Since there are many different ways to set your device's SCSI Target ID, we are unable to give examples in this manual. You will have to refer to your SCSI device owner's manual to set the device(s) SCSI Target ID(s) properly. If the manual doesn't help you, contact the dealer from whom you bought the drive. Remember, if all else fails, contact Columbia Data Products for help.

```
NOTE: To be available as a boot device, the drive   must   be
set to SCSI Target ID 0.
```

Installing the Subsystem
in Your Computer

Now that the FASST controller and the SCSI device(s) are set up and the cables are properly oriented, you are ready to install the entire subsystem inside your computer.

Follow the next few steps to install the controller and SCSI device:

- Make sure the computer is OFF and UNPLUGGED.

- Remove the cover from your computer. If you are unsure as to how to do this, refer to your computer's operations manual.

- Locate a 16-BIT expansion slot for the 7000--FASST2 or an 8-BIT slot for the WDATXT-FASST card. Typically, the expansion slots are on the left side of the chassis toward the rear of the computer (see Diagram Five for details).

- Remove the screw holding the slot cover to the rear of the chassis.

- Slide the controller into place with its tabs meeting the grooves in the expansion slot. The end plate of the card, with the external connector, should be in the same place which the slot cover just occupied.

- When the tabs meet the grooves, press carefully on the top edge of the card. The tab will snap into place.

- Replace the slot cover screw, which will now secure the end plate bracket of the FASST controller to the back of the computer.

- Select the drive bay in your computer where you wish to place your SCSI device.

- Remove the front screws on the small retaining L-shaped brackets attached to the selected drive bay.

- Slide the SCSI device into the drive space with the metal cover facing up (the electronics should be facing down).

- Connect the cable to the SCSI device, making sure of Pin 1 orientation.

- Plug a 4-pin power cable from the power supply to the power connector on the SCSI device (typically it is keyed so you can't plug it in wrong).

- Insert the two L-shaped brackets and the screws you removed from your computer to secure the hard disk into the drive space.

- Conduct the rest of the software installation, set up your partitions and satisfy yourself that the FASST subsystem is operating properly.

- Re-install the computer's cover.

DIAGRAM FIVE
Rear of Computer

Power Supply

16 Bit Slot

8 Bit Slot

Front of Computer
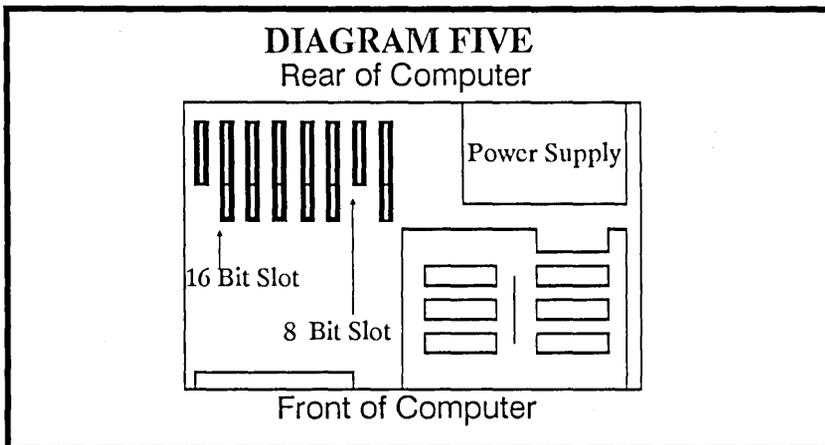
Hardware Installation Summary

1) Strip the new system to a motherboard, power supply, monitor with card, keyboard, and the SST card. This is to minimize the potential of a conflict over I/O port address, ROM BIOS address, IRQ vector, or DMA channel.

2) If you are only attaching one device, set it to SCSI TARGET ID 0 ("drive select"). Set each additional SCSI device to a unique SCSI TARGET ID between 1 and 6.

3) Set **ALL** devices to take termination power **FROM** the SCSI cable.

4) Boot on a DOS floppy and run SSTSETUP. Create a DOS bootable partition and allow the program to copy the necessary files.

5) Re-boot the system. If you sucessfully boot on the hard drive, start replacing any additional cards or devices that you removed in step 1, re-booting after adding each device to check for conflicts with the new cards.

6) After your system hardware is competely installed and the system boots normally, you are ready to set up your partitions as you want them in your final configuration.

Chapter 4:
Disk Partitioning and
MS-DOS Installation

It is the purpose of this chapter to introduce you to SSTSETUP and disk partitioning. Read through this section completely before doing your final software installation. The FASST controller is a very versatile system. It has many features which you may wish to start using right away. As it is simpler to explain a function such as disk partition with specific examples, given the widespread common understanding of the DOS operating system, this chapter serves the dual role of explaining partitioning in general and DOS in particular. If you do not intend to use a SCSI hard drive with your SST system, you do not need to concern yourself with partitioning.

Contents

Time to Turn on Your Computer

Now that you have all the hardware installed correctly, turn on your AT and let's start the software installation process. After you first turn on your computer and it has performed its diagnostics and memory check, you should see the following message on your screen:

> *FASST ROM Resident BIOS Version 3.36 WD - 7000*
> *Copyright (c) 1987-1990 Columbia Data Products, Inc.*
> *All Rights Reserved*

OR

> *FASST ROM Resident BIOS Version 3.36 WD - ATXT*
> *Copyright (c) 1987-1990 Columbia Data Products, Inc.*
> *All Rights Reserved*

If you get an error message during this process, shut off your computer and check your hardware installation. If everything goes OK, your computer will begin to boot. Remember that this process can take anywhere from 10 to 60 seconds, depending on how many hard drives are attached to your computer and other factors. Wait at least that long before suspecting that anything is wrong.

If you have installed the SST in a computer as the ONLY hard drive controller, you must boot from the floppy drive A:. Simply insert a bootable DOS floppy diskette in Drive A: and boot as you normally would.

If you have installed the SST in a computer as an ADDITIONAL hard drive controller, the computer will first try to boot from the floppy drive and then boot from your hard drive C: as it normally does. **Boot from floppy drive A: before running SSTSETUP.**

Your PC AT's Setup Program

Your AT should have come with a setup program which lets you tell the AT what you have installed. When you run the setup program, some of the things you tell the AT are how much memory is in your computer, how many and what type of floppy drives you have, what type of display you are using, and so on.

So, what about hard drives? For most hard drive systems which connect to your AT, you have to tell the computer, via the setup program, how many and what type of hard drive(s) you have installed. If you are adding the SST controller to a computer which already has a hard drive installed in it, there is no need to run your AT's setup program. The SST controller will AUTOMATICALLY tell the computer that it is installed.

If you are installing the SST in your computer as the ONLY hard drive, then you should run the AT setup program and tell it that you have NO hard drives installed. If you tell it anything else, you will get error messages and the computer may not boot properly.

> **NOTE: If you are installing the SST controller in a computer which already has a hard drive, do NOT run the AT setup program and try to tell it that you have added the SST controller. This is done automatically by the SST software.**

Some of you may want to install the SST controller in your computer with your existing hard drive long enough to transfer the data on your existing hard drive to the SST hard drive system. Then you may remove your existing hard drive and put it elsewhere. To do this, install the SST controller and hard drive and DO NOT run your AT's setup program. Read the rest of this chapter and finish the software installation for the SST controller. When you have completed the software installation and have copied all the data from your existing hard drive to the SST hard drive, remember that you MUST run your AT's setup program and tell it that you have NO hard drives installed!! **NOTE: If you are planning to remove your existing hard drive after copying all your data to the SST drive, remember to make a BOOTABLE partition on the SST drive during installation! Otherwise, you will be unable to boot from the SST hard drive when you remove your existing hard drive.**

Your CONFIG.SYS File

If you are installing the SST hard drive in your computer as an additional hard drive, then you MUST edit your existing CONFIG.SYS file to let your computer know that you have installed the SST controller. You should copy the necessary files from the SST INSTALLATION diskette to the bootable hard drive (drive C:).

To do this, insert the SST INSTALLATION diskette in drive A:, then type the following commands:

> *COPY A:SST*.* C: (enter)*
> *COPY A:READ*.* C: (enter)*
> *COPY A:BUFF*.* C: (enter)*

If you are using a removable cartridge hard drive, copy LOCK.EXE and UNLOCK.EXE to your hard drive as well. If you will be using two 7000 cards, copy the file WD7000.SYS also.

This will copy all of the SST files needed to run the FASST system. Once you have done this, you MUST add the following lines to your CONFIG.SYS file by using EDLIN or some other text editor:

> *DEVICE = SSTBIO.SYS**
> *DEVICE = SSTDRIVE.SYS*

* There are configuration options available which can customize your SST SCSI sub-system; please see Appendix H: SSTBIO.SYS Configuration Options for more information.

If you DON'T have a CONFIG.SYS file on your existing hard drive, then type the following command:

> *COPY A:CONFIG.SYS C:*

If you would like, use EDLIN or some other text editor to enter the following line into your AUTOEXEC.BAT:

> *BUFFERS*

This will run the Buffer Advisor program every time you boot your machine to let you know whether your "BUFFERS =" statement is set correctly in your CONFIG.SYS. If it is not, you will be prompted if you would like to change it.

For DOS versions before v3.31, the SST software breaks the "32-megabyte barrier" by increasing the sector size. The BUFFERS DOS environment variable is directly related to the sector size so the recommended amount of BUFFERS in your CONFIG.SYS varies with the individual configuration of each system. The following table explains what the logical DOS sector size is and how we recommend your BUFFERS to be set:

Partition Size in MB	DOS Allocation Size		Recommended BUFFERS setting
	Sector	Cluster	
1-32 MB	512 byte	2K	20
33-63 MB	1K	4K	20
64-127 MB	2K	8K	12
128-255 MB	4K	16K	6
256-512 MB	8K	32K	3

REMOVABLE MEDIA AND DOS SECTOR BUFFERS.
If you are using removable media, the default sector size will be 8K. In this way dynamic removability is assured by forcing support for the largest possible partition (512 MB), allowing you to switch between cartridges without rebooting. If you have control over all of your removable media and know that the largest partition you will have to address is, for example, 30 MB, then the largest sector you will need is 512 bytes. In this case you should use the "/S:0" switch on SSTDRIVE.SYS. See Appendix H, page 13.

If you DON'T have an AUTOEXEC.BAT file on your existing hard drive, then type the following command:

  COPY A:AUTOEXEC.BAT C:

You are now ready to run the SSTSETUP program.

Running SSTSETUP

Now that you have the computer up and running, you should be at a DOS prompt - either A: or C:. Put the SST INSTALLATION diskette in Drive

A: and get to Drive A: by typing A: and pressing the Enter key. Now type
SSTSETUP and press the Enter key. The program will load and you should
see the opening screen. It will ask you whether or not you wish to use the
color version or the black and white version of the program. Pressing F1
(Function key 1) will allow you to enter black and white mode and pressing
any other key will leave you in color mode. Once in black and white mode,
you are given the option to return to color mode or simply proceed.

Throughout this explanation of the SSTSETUP program, we will assume
that you have an imaginary computer. Connected to this imaginary com-
puter are two 41-megabyte hard drives or one 42-megabyte removable
cartridge hard drive. This will allow us to explain the concepts of spanning
and multiple drive support.

After determining whether or not you wish to use color or black and white,
you will see the registration message. This gives you information on how to
register your SST software.

> **NOTE: It is important to register your SST software with
> Columbia Data Products, Inc. If you don't, we have no way of
> alerting you about new features and upgrades to your SST
> system!**

Now you will see the main menu (see Diagram Six - if you are using fixed
devices, refer to Diagram Six Section A; if you are using a removable
cartridge drive, refer to Diagram Six Section B). From here you will be able
to create partitions, delete partitions, select which hard drive you wish to
work with, examine drives, run the advanced features, get on-line help, or
quit the program.

You will notice that there are seven boxes at the bottom of the screen; normal
fixed drives are denoted by solid boxes and removable cartridge drives are
denoted by dashed boxes. These boxes represent the number of hard drives
you have attached to the SST controller and their size in megabytes. The
SST controller figures the size of the attached hard drive(s) automatically.
The shaded box represents the currently selected hard drive.

DIAGRAM SIX

A)

```
          SST Setup Utility Ver. 3.36
  (C) Copyright 1987-1990 Columbia Data Products, Inc.
               All Rights Reserved


                   MAIN MENU

                 ┌─────────────────────┐
                 │ CREATE PARTITION     │
                 │ DELETE PARTITION     │
                 │ SELECT DRIVE         │
                 │ EXAMINE DRIVE        │
                 │ ADVANCED MENU        │
                 │ HELP                 │
                 │ QUIT                 │
                 └─────────────────────┘


  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐
  │ 1 │  │ 2 │  │ x │  │ x │  │ x │  │ x │  │ x │
  └───┘  └───┘  └───┘  └───┘  └───┘  └───┘  └───┘
  41 MB  41 MB XXXX MB XXXX MB XXXX MB XXXX MB XXXX MB
```

Fixed Devices Attached

B)

```
          SST Setup Utility Ver. 3.36
  (C) Copyright 1987-1990 Columbia Data Products, Inc.
               All Rights Reserved


                   MAIN MENU

                 ┌─────────────────────┐
                 │ CREATE PARTITION     │
                 │ DELETE PARTITION     │
                 │ SELECT DRIVE         │
                 │ EXAMINE DRIVE        │
                 │ ADVANCED MENU        │
                 │ HELP                 │
                 │ QUIT                 │
                 └─────────────────────┘


  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐  ┌───┐
  │ 1 │  │ x │  │ x │  │ x │  │ x │  │ x │  │ x │
  └───┘  └───┘  └───┘  └───┘  └───┘  └───┘  └───┘
  42 MB XXXX MB XXXX MB XXXX MB XXXX MB XXXX MB XXXX MB
```

Removable Cartridge Drive Attached

> NOTE: THE REPORTED DRIVE SIZE MAY APPEAR LESS THAN STATED BY THE MANUFACTURER FOR SEVERAL REASONS: FIRST, THERE IS AN AREA RESERVED BY THE VENDOR FOR SCRATCH PURPOSES; SECOND, WE VIEW A MEGABYTE AS 1,048,576 BYTES (2^{20}) AND THE VENDORS REFER TO IT AS 1,000,000 BYTES (10^6). THEREFORE, OUR REPORTED SIZE APPEARS LESS THAN THEIRS BUT MEANS THE SAME THING.

To select the command you want, simply type the first letter of the command (C for Create Partition, D for Delete Partition, etc.) or use the arrow keys to move the shaded box up or down. Once you have selected the desired command, press the Enter key.

The SSTSETUP is considered a PARTITION editor, and the word "partition" appears in several places throughout this manual, so it would be a good idea to define exactly what a PARTITION really is.

Partitioning of a disk allows you to divide the disk into multiple and more manageable sections. For example, if you have two 41-megabyte drives attached to your system, you don't have to have a drive C: which is 41 megabytes and a drive D: which is 41 megabytes. You may divide those 41-megabyte drives into smaller, more manageable "partitions".

Now the question is, "Why would I want to partition my disk?". The answer depends on how you plan to use your hard drive. If you plan to have large files (such as big database files or spreadsheets), you will want to partition your disk into larger segments. If you don't have large files, then you will want to partition your disk into smaller segments.

The thing to keep in mind, however, is that the size of the partition you have created is also the size of the largest file you may create on that partition. For example, if you create a 20-megabyte partition on your 41-megabyte hard drive and that partition becomes drive C:, then, the largest file which may be stored on drive C: is 20 megabytes.

So you ask, "Why don't I just make the largest partition size available?". The answer is efficiency. Small partitions are much more efficient than large ones in storing files. Big partitions are designed to hold big files. Small partitions are designed to hold small files. It's just that simple. Keep that in mind when you are choosing your partition sizes.

The reasons for this are found in the structure of DOS. Under the DOS operating system, the smallest unit of allocation (in other words, the least

amount of space that a file can occupy on a disk) is one cluster. A cluster is typically four sectors. On a normal DOS disk where the sector size is 512 bytes, the normal cluster is 2048 bytes, or 2K. On an SST partition that exceeds the 32-megabyte barrier, for a DOS version before v3.31, the sector size is increased by up to 8K, as indicated by the table on page 4-5. Therefore, if you create a 300-megabyte partition, you will have an 8K-sector size and a 32K cluster. On that partition a two-line batch file will take 32K of storage, or sixteen times the storage space on a 30-megabyte partition..

The other DOS structural consideration is the FAT. If you have literally thousands of FAT entries, the time required to search for and find any one file entry is greater than in a FAT structure that only has hundreds of entries. If you have applications that use huge data files, a huge partition will be quite convenient. If you have thousands of small word processing files, you will be better off with many 32-megabyte partitions than with one huge partition.

Create Partition

The Create Partition command allows you to create a partition on the disk which will be assigned a drive letter (C:, D:, etc.). You may create partitions on only the selected hard drive. At the bottom of the screen, the shaded box indicates which hard drive is currently selected.

You can create a maximum of 30 partitions on any one hard drive. DOS, however, only allows you to use 24 partitions (C: through Z:). The only way to use more than 24 partitions is to use the Activate Partition function, which is explained in the Advanced Menu section of this chapter.

> NOTE: The hard drive(s) you just connected to the SST controller will have NO partitions on it. You must use the Create Partition command to create DOS partitions on the hard drive(s) before it can be used.

The first thing you will be asked to do is: "Enter the partition type". A menu will be shown offering the types of partitions available.

Respond by hitting the appropriate key or moving the light bar to your choice and press the Enter key. In this section we will only concern ourselves with DOS.

The next thing you will be asked is whether this partition is going to be for DOS versions 3.31 or greater. If it is, and the partition size is greater than 32 megabytes, the partition type will be listed as DOS + instead of DOS. If

you are using Zenith DOS 3.30+, which also breaks the 32-megabyte barrier, respond with a "Y" to the previous question.

> **NOTE: If you are using DOS version 3.30 or less and you answer "Y" to the question "DOS 3.31 or greater ? ", the system will not operate properly.**

The next thing you will be asked to do is: "Type in the partition size in megabytes and press Enter".

The number of megabytes available to you for this partition is displayed above the question. The smallest partition you will be allowed to create is one megabyte. The largest partition you will be allowed to create is 512 megabytes. Next to the megabytes chosen will be the equivalent amount in bytes (one megabyte = 1,048,576 bytes).

If your partition size is less than or equal to 32 megabytes in size, you will be given the option to make it bootable. DOS versions 3.31 and above have no 32-megabyte barrier so any size partition can be bootable.

> **NOTE: You can create a "bootable" partition on any hard drive; however, you may only boot from hard drive number 1 (ID 0).**

If more than one partition has been made bootable, a menu will appear when the machine is rebooted. You will be able to choose between the available partitions. The drive partition you boot from will become drive letter C:.

Drive letters (C:, D:, etc.) will be assigned to partitions in the order you created them. The only exception to this is the current boot partition. The boot partition is always the first SST drive letter allocated. For example, if you create five partitions on your disk, and the SST controller is the ONLY hard drive controller installed in your computer, the bootable partition will be drive C: even though it was the third partition you created (see Table One on the next page).

If the SST has been installed as a second hard drive system, then your existing hard drive system will be drive C:. If you had TWO existing hard drives, then your existing hard drives would be C: and D:. Next would come the partitions in the order you created them (see Table Two on the next page).

Table One

	Partition Number	Drive Letter
SST Boot Partition	3	C:
SST Partition	1	D:
Next SST Partition	2	E:
Next SST Partition	4	F:
Next SST Partition	5	G:

Table Two

	Partition Number	Drive Letter
Bootable Existing Hard Drive	N/A	C:
Non-Bootable Existing Hard Drive	N/A	D:
SST Partition	1	E:
Next SST Partition	2	F:
SST Boot Partition	3	G:
Next SST Partition	4	H:
Next SST Partition	5	I:

After you have entered the number of megabytes for the partition and made the partition bootable or non-bootable (if the option was given to you), the next thing SSTSETUP asks for is a partition name. The partition name is optional and is for your use only. It helps to readily identify one partition from another. This is a useful feature because it may prevent you from accidentally deleting the wrong partition, should you decide to delete a partition.

After entering the partition name, the editor will then ask whether you would like to perform a surface scan. This is helpful for drives which are not certified 100 percent defect free. This feature will scan the disk for bad clusters and map them to the file allocation table. This feature is not

necessary for proper functioning; it is a safeguard to make sure the disk is in prime operating condition.

Once you have entered everything, SSTSETUP displays what you have selected near the top of the display box and asks you if this is correct. If it is, just type "Y" and SSTSETUP will create the partition on the hard drive. During this process, SSTSETUP automatically formats the partition for use.

NOTE: There is NO need to run FDISK or FORMAT programs on SST partitions. The functions those programs provide under DOS are automatically performed for you by SSTSETUP.

If you created a bootable partition on the SST drive, SSTSETUP will ask you for a bootable DOS (MS-DOS version 3.20 or greater) floppy. The SSTSETUP program will then copy the files necessary for booting from the floppy to your bootable partition. After it has transferred the DOS files, SSTSETUP will ask for the SST INSTALLATION diskette. The files necessary to run the SST software will then also be transferred to the boot partition.

NOTE: The SST software will ONLY work with DOS 3.20 or greater.

You may create a partition larger than one hard drive if you have two or more hard drives attached to the SST controller. This is known as "spanning". For example, you have have two 41-megabyte hard drives attached, by using "spanning", we could create a one megabyte bootable partition and an 81-megabyte partition. As you can see, the 81-megabyte partition would "span" the two hard drives.

To use the spanning option, you must go to the Advanced Menu and enable the spanning feature. For more information on spanning partitions, refer to the Advanced Features section of this manual.

It is not necessary to use up all the available space on your hard drive(s). Unless you need the hard drive space, we suggest you keep about five megabytes available (if possible) for future SST enhancements. After creating the partitions, the computer will reboot when you exit SST SETUP and you will be able to use your newly created partitions.

Delete Partition

The Delete Partition command allows you to delete partitions which you have previously created. You may delete partitions on only the currently selected hard drive. At the bottom of the screen, the shaded box indicates which hard drive is currently selected.

> **WARNING: This is a VERY destructive function. Once a partition has been deleted, there is NO chance for recovery! ALL partitions following the partition you are deleting will ALSO be deleted, INCLUDING ALL DATA, with no hope of recovery!**

Deletion of a partition results in every partition following it to also be deleted. For example, let's assume you have created four partitions on one of the 41-megabyte hard drives - a 10-megabyte boot partition, an 11-megabyte partition, and two additional 10-megabyte partitions. You then decide to delete partition number two. Partition three AND partition four are deleted right along with partition two (see Table Three).

Table Three		
Partition status BEFORE deleting partition 2		
Partition Number	Partition Type	Partition Size
1	DOS (BOOT)	10 MB
2	DOS	11 MB
3	DOS	10 MB
4	DOS	10 MB
Partition status AFTER deleting partition 2		
Partition Number	Partition Type	Partition Size
1	DOS (BOOT)	10 MB
2	****DELETED****	
3	****DELETED****	
4	****DELETED****	

Once you have selected the Delete Partition command, you will be asked to enter the number of the partition number which you wish to delete. SSTSETUP will show you the partition's information in a shaded line near the top of the screen. If you are sure this is the partition you wish to delete, answer "Y" to the question.

The Delete Partition command can be VERY destructive for drives which are using spanned partitions. For example, you create four partitions on your two imaginary 41-megabyte hard drives; the first is a 20 megabyte

partition, the second is a 30-megabyte partition (this partition must be spanned because there are only 21-megabytes left on the hard drive), and the third and fourth are both 16-megabyte partitions (see Table Four). If you delete the 30-megabyte spanned partition (partition two on hard drive 1), you will also delete the two 16-megabyte partitions. Because the first nine megabytes of the second 41-megabyte drive is a spanned partition which you requested to be deleted, all partitions following it must be deleted as well.

Table Four

Partition status BEFORE deleting the spanned partition

Hard Drive #	Partition Number	Type	Size
1	1	DOS (BOOT)	20 MB
1	2	DOS (SPAN)	21 MB
2	1	SPAN	9 MB
2	2	DOS	16 MB
2	3	DOS	16 MB

Partition status AFTER deleting the spanned partition

Hard Drive #	Partition Number	Type	Size
1	1	DOS (BOOT)	20 MB
1	2	****DELETED****	
2	1	****DELETED****	
2	2	****DELETED****	
2	3	****DELETED****	

As you can see in Table Four, partition one on hard drive 2 is a "span" partition of nine megabytes. When partition two on hard drive 1 was created, you asked for 30-megabytes. Only 21-megabytes physically existed on hard drive 1, which were assigned to partition two on hard drive 1. The other nine megabytes were allocated on the beginning part of hard drive 2. These two partitions combined to form a single 30-megabyte DOS drive. ALL the math is automatically done for you. Just be careful when deleting, or you may lose more than you intended.

Select Drive

The Select Drive command allows you to choose which hard disk drive you would like to work with. Once you have executed the Select Drive command, the box indicating the current hard drive will blink. You may then use the arrow keys to move the blinking box to the desired hard drive.

> **NOTE: This command ONLY works when more than one hard drive is attached to the SST controller.**

Instead of using the arrow keys, you may enter the number of the hard drive you wish to work with. The selected drive is used with the Create Partition command, Delete Partition command, Examine Drive command and, under the Advanced Menu, the Partition Verify command, Partition Write Protect command, and the Format command.

Examine Drive

The Examine Drive command shows you a list of all the partitions which exist on the hard drive you have selected. A table is printed to the screen containing the partition number, the partition name, the partition type, the partition size, and other information such as whether the partition is a boot partition or is spanning or is write protected.

The number of megabytes presently not in use on your hard drive is also printed on the screen. Pressing the Escape key or "Q" will return you to the main menu. The F2 key is a "hot key" which will allow you to examine the partitions on the selected drive at any time in the setup program.

The Advanced Menu Commands

The Advanced Menu is an additional menu of very powerful commands. Among these commands are Spanning, Diagnostics, Write Protect, SSTSETUP Password Protect, and the Format command.

> **WARNING: The Advanced Menu contains commands which can DESTROY all the data on your hard drives. Read this section carefully before using ANY of the Advanced Menu commands.**

To use the Advanced Menu commands, move the shaded bar over Advanced Menu and press Enter, or simply type "A".

Editor Setup (Spanning)

The first command in the Advanced Menu, if you have more than one hard drive attached, is the Editor Setup command. Currently, the only option available under Editor Setup is the Spanning command.

The shaded bar will appear over the Spanning command and, if you press the Enter key, you will execute the Spanning command. The current status of spanning will be displayed (spanning is either on or off). The Enter key will toggle it on and off like a light switch. Once you have decided to turn spanning on or off, you can either press "Q" to return you to the Advanced Menu or the Escape key to return you to the Main Menu.

Spanning allows you to create a partition larger than one hard drive. In order to use spanning, you must turn it on as previously explained. Once turned on, you can then go to the Create Partition command and make partitions which span hard drives.

Normally, when you create a partition, you are given the total megabytes available for a new partition on the selected drive. With spanning turned on, however, you are given the total megabytes remaining on the selected drive PLUS the next hard drive and the next hard drive and so on until it has either run out of hard drives or it finds a hard drive which has a partition on it. This number will always be less than 512 megabytes because this is the maximum DOS partition size allowed (you can have multiple 512-megabyte partitions - this is a maximum SINGLE partition size).

NOTE: You cannot span into or from a removable cartridge.
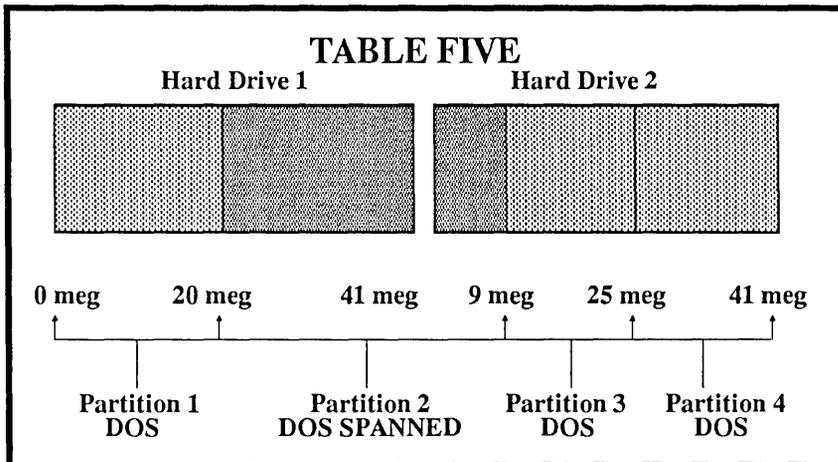
TABLE FIVE

Table Five illustrates a typical spanning partition arrangement. Partition one is a 20-megabyte partition which resides completely on hard drive 1. Partition two is a 30-megabyte partition in which 21 megabytes reside on hard drive 1 and nine megabytes reside on hard drive 2. Partitions three and four are 16 megabytes each in size and completely reside on hard drive 2.

For details on deleting a spanned partition, read the Delete Partition section.

Diagnostics

There are two types of diagnostic tests which can be performed on the hard drive(s) from SSTSETUP. These are Drive Verify and Partition Verify. These tests completely read and/or write/read every single block on either the selected hard drive or the selected partition.

> **WARNING: The Write/Read test is destructive and will erase ALL data on your hard drive with NO chance for recovery. Use with extreme caution!**

The Drive Verify option will test all areas of the selected hard drive. First, you are asked whether you want a Read or a Write/Read test. Next, it asks which physical drive you want to verify. It will then start the lengthy process of testing the whole drive. If you would like to abort the procedure before it is finished, press the Escape key or "Q". If an error is found, it will print the error message and wait for you to press a key.

The Read function will read each block and report any read errors found, with no changes made to the drive.

The Write/Read function will DESTRUCTIVELY write to each block. Then it reads the same block, compares the read and write data for errors, and reports them to you. You will not be allowed to perform this test on a drive containing a spanned partition or a write protected partition. Once this test starts, all data and partitions will be destroyed with NO CHANCE OF RECOVERY!

The Partition Verify option performs the exact same functions as the Drive Verify except that it tests an individual partition on a hard drive instead of the entire hard drive.

Write Protect

The Write Protection command is like putting a write protect tab on a floppy diskette, only now you can do it to your hard drive partitions. You will be able to read any data on the partition you protect but you cannot write to it. You also cannot delete the partition or Write/Read verify the partition until the write protection is removed.

After you choose this option, you will then select which partition you wish to either write protect or un-write protect. Just press the Enter key to turn it on and off. If you change the write protect status of a partition, SSTSETUP will re-boot the computer when you leave the editor.

Set Password

The SST Password command puts a password on SSTSETUP. This prevents unauthorized persons from running the SSTSETUP program and doing potentially destructive things. Untrained personnel are one of the biggest threats to your hard drive data.

Once the command is selected, you will be asked for a new password. Type in new password, noting uPpEr or LoWeR case, and press Enter to set the new password, or you can disable the password by just pressing Enter. Pressing the Escape key during the password prompt will exit with no changes. Make sure that you keep your new password in a safe place! Call Columbia Data Products, Inc. for help if you lose your password.

Again, SSTSETUP will re-boot the computer if you have made any changes.

Format

The Format command allows you to either format a partition or your entire hard drive. The hard drive format is usually performed to change the interleave from one value to another.

> **WARNING: The Format command is EXTREMELY DESTRUCTIVE and will destroy all data on your hard drive or partition with NO chance for recovery.**
> **NEVER power off or abnormally terminate a low level format or you may PHYSICALLY DAMAGE your drive.**

The Format command will ask whether you want to do a partition format or a drive format. This is referred to as high-level formatting or low-level formatting, respectively. The Partition Format command will ask for a partition number, display it, and ask you to confirm it. Partition Format will destroy all the data in the partition. If you are formatting a boot partition, you will be prompted for your DOS disk and SST installation disk at the appropriate times. The Drive Format command will first warn you about the destruction it will cause. It will then ask you for a hard drive number. Next, it will ask you what interleave value you want. For the highest possible performance, this value should be a 1. It will again warn you and then start

the format. You cannot do a Drive Format if the drive contains any part of a spanned partition. REMEMBER, ALL DATA AND PARTITIONS ON THAT DRIVE WILL BE LOST WITH NO CHANCE FOR RECOVERY. You will have to repartition your disk after a drive format before you can use it again.

Change Boot

The Change Boot command allows you to toggle the boot status of an SST bootable partition. If you toggle all of the drives off, the machine will only boot from a floppy.

Activate Partition

This command will allow a partition to be "turned off" so it cannot be seen during operation of the hard drive and, conversely, you can "turn on" inactive partitions. This is especially helpful when using a Removable Cartridge Hard Drive. Using SSTSETUP will allow you to toggle the partition on and off and the Examine Drive command will tell you the status.

Removable Cartridge Drives and SSTSETUP

When using SSTSETUP on a removable cartridge drive, you will notice a difference in the boxes on the bottom of the screen. If the drive is removable, it is signified by a dashed box instead of a solid box.

If you have selected the removable drive and are not at the opening menu, then a protect feature comes into effect. This is called LOCK DOOR. You will not be able to remove a cartridge from the drive as long as you are performing any operations on it. Once you return to the main menu, you may remove the cartridge if you wish.

Using Removable Cartridge Hard and Magneto Optical Drives

Dynamic Removability

Dynamic removability is simply defined as the ability to interchange cartridges in a removable hard drive at any time you wish. Simple as this sounds, DOS does not see it that way. DOS insists on keeping the same number of logical drives (drive letters) and the same size sector buffers. You can only change its mind by rebooting the system, which is not what is meant by "dynamic removability". The solution is to set aside enough drive letters (with a large enough sector size to support the maximum number of partitions on any cartridge that could be swapped into the drive) and the sector size required by the largest possible partition on any cartridge. By default the SST software sets aside four drive letters and establishes an 8K sector size/32K cluster. Both of these default values are selectable with switches on the SSTDRIVE.SYS driver. By adding a "/R:X" you can define as "X" the number of drive letters to be allocated for each removable device on the SCSI bus. The default is four drive letters (see APPENDIX H, page 12).

The predefined sector size may also be selected. This is acomplished with the "/S:X" switch on SSTDRIVE.SYS driver. "X" must be 0,1,2,4 or 8 to select a sector size of 512-bytes, 1K, 2K, 4K or 8K respectively. If you are using a v3.31 or later DOS, you should use the "/S:0" switch. If you are using a "pre-3.31" DOS, refer to the chart below and select the "/S:" number on the line with the size of your largest partition. The default is 8K (see APPENDIX H, page 12).

Partition Size in MB	DOS Allocation Size		Recommended /S: setting
	Sector	Cluster	
1-32 MB	512 byte	2K	0
33-63 MB	1K	4K	1
64-127 MB	2K	8K	2
128-255 MB	4K	16K	4
256-512 MB	8K	32K	8

If you try any operation on a removable hard drive which has no cartridge installed, you will get a DRIVE NOT READY error. If there are no partitions recognized by DOS on a cartridge, then you will still be given the four drive letters but you will get a DRIVE NOT READY error on each allocated drive letter.

Removable Cartridge Drives as DOS BOOT Devices

There are several things in particular under DOS for which you must watch. First, if you boot from the removable drive, please be careful when exercising Dynamic Removability. If you change the cartridge and it does not have the same COMMAND.COM version installed on it, the system may hang. Also, if you are running any type of menu program which is pathed to your drive C:, you may have some problems finding files if you remove your cartridge in mid-operation.

LOCK.EXE and UNLOCK.EXE

Included on the SST Installation Diskette are two files specifically for removable cartridge hard drives. These programs are called LOCK.EXE and UNLOCK.EXE. The purpose of LOCK.EXE is to increase the performance of your removable drive. Along with increasing performance, the media installed in the device becomes locked into place and the door will be unable to be opened except by UNLOCK.EXE. There is no need to specify a drive letter when running either program as they will lock/unlock all removable cartridge devices.

Chapter 5:
NOVELL INSTALLATION

NOTE: The ATXT-FASST DOES NOT currently support NOVELL.

NOTE: Removable Media ARE NOT supported by NOVELL.

What to do first for Netware 286 v2.1x Advanced and SFT...

- Boot your computer with MS-DOS from drive A:
- Run SSTSETUP and create a NOVELL partition (see Chapter 4)
- Reboot your computer with MS-DOS from drive A:
- Copy SST_DRVR.OBJ to DSK_DRV_001 Novell disk
- Copy SST_DRVR.DSK to AUXGEN disk
- Boot from a DOS diskette
- Run NETGEN -n according to the Novell installation guide

Warning: Make sure no RAM resident programs are loaded or the Novell installation will not work properly.

RUNNING NETGEN -n

Boot in DOS from a DOS boot diskette. Do NOT load netware. Put the NETGEN diskette in drive A:. Initiate NETGEN with the line:

   A:> NETGEN -n

Conduct NETGEN entirely from the floppies. If you are set up to conduct NETGEN from a hard drive, be sure to download to the floppies before proceeding to the Netware Installation phase.

When you get to the select disk driver section of NETGEN, choose the "SDLP MULTI-FUNCTION CONTROLLER" option. The SST can reside at any Netware disk channel (0-4). **NO JUMPERS ON THE SST CARD NEED TO BE MOVED FOR CHANNEL SELECTION.**

Be sure to configure your network resources via the Configure Network Resources menu and confirm the settings against our specifications in Chapter 1. For further information, consult the Netware installation documents or, if all else fails, contact Columbia Data Products.

COMPSURF

Since SCSI devices are, by standard, logically defect free, it is only necessary to set the parameters to their lowest values and run the surface analysis. However, since this does not do a complete surface check, you may feel more confident running a full COMPSURF.

NETWARE 386 INSTALLATION

> **This section is not intended to replace a careful reading of the Netware386 documentation but merely to provide a thumbnail sketch of the procedure for using an SST subsystem in that operating system.**

1) Run SSTSETUP and create a Netware386 partition(s) and at least one bootable DOS partition. Netware386 is NOT a bootable operating system.

2) Be sure at least one LAN adapter card is installed in the new server.

3) Boot from a DOS partition. It will be advantageous to copy the Netware System diskette to a path on this partition.

4) Put the Novell diskette with SERVER.EXE in drive A: and type "*A:SERVER*".

6) In response to the prompts from SERVER.EXE:

> a) Enter a unique Server name.
> b) Enter a unique IPX Internal Network Number for the new server that is not in use anywhere on your internet. Please note that you will later be asked for the IPX number of your local ethernet network, which must also be unique. See the Novell documentation for a discussion of IPX numbers.

7) Place the Columbia Data Products, Inc. installation diskette in drive A: and from the server console command line. TYPE:

7) Place the Columbia Data Products, Inc. Installation diskette in drive A: and from the server console command line type:

LOAD A:\NOVELL\NW386\SDLPDRVR.DSK (enter)

8) Put the Novell diskette containing INSTALL.NLM (Netware Loadable Module) in drive A: and from the server console command line type:

LOAD A:INSTALL (enter)

> **NOTE: This will display the install menu screen. You may return to the console screen at any time by pressing <ALT><ESC>, or be offered a selection menu by pressing <CTRL><ESC>.**

9) Select "Disk Options".

10) Select "Partition Tables" and use the complete disk as Netware 386 disk. Novell will see the SST NETWARE/386 partition as a complete physical device. Select or enter your options as they are presented by the install script.

11) Select "Volume Options" and create volumes for your partitions.

12) Before selecting "System Options", press < ALT > < ESC > and from the server console command line type:

mount SYS (or what you named the new SYS partition) (enter)

13) Press < ALT > < ESC > to re-enter the install utility and proceed to installing the rest of Netware386.

NOVELL 286 & 386 MULTI-BOARD SUPPORT

Make sure that the second SST card's W-98 jumper or the ROM has been removed and the jumpers are configured per Chapter 1, page 7.

For Netware 286, during Netgen's "Select disk driver" section choose the "SDLP Multi-Function Controller" as in standard installation. Upon completion of the first selection, select "Select Loaded Item" once again, this time selecting the second channel in which you wish the second host adapter to reside. "SDLP Multi-function Controller" will now appear twice on the Select Disk Driver screen. The SST cards can reside at any Netware disk channel (0-4). For Netware386 load SDLPDRV1.DSK per step 7 above, and proceed with Netware 386.

Custom IRQ Settings for Netware

You may select alternative IRQ lines for use with the SST subsystem under Novell.

1) After you have selected the SDLP Multi-Function Controller in the Select Disk Driver section of NETGEN, go to the configuration option of that menu.

2) Highlight and select the IRQ of your choice. You will have a choice of IRQ 15 (default), 12, 11, or 10.

3) Refer to Chapter 1, page 8 and change the jumpering of your card to reflect your new IRQ selection.

4) If the SST subsystem is **not** the BOOT device for your system, you may also select the settings of DMA 5, I/O Port 330h, and IRQ 11. If you do wish to use these settings, note that the BOOT ROM **MUST** be removed from the card. Follow the hardware configuration instructions for a second 7000-FASST2 card on page 7 of Chapter 1. **YOU WILL NOT BE ABLE TO ACCESS ANY OTHER OPERATING SYSTEM IF THE FASST CARD IS CONFIGURED IN THIS WAY!**

NOTE: You may be limted in the other operating systems which will be available to you if you customize your IRQ. OS/2 will only support IRQ 15, and Unix/Xenix must be reconfigured to conform to your new settings.

Chapter 6:
OS/2 INSTALLATION

NOTE: THE WDATXT-FASST CARD WILL ONLY SUPPORT OS/2 IN DMA MODE - SEE 2-5 FOR JUMPERING INSTRUCTIONS.

NOTICE: CACHE01.SYS is NOT supported for SST subsystems.

SSTSETUP AND OS/2

Follow the steps listed in CHAPTER 4 to create an OS/2 partition. SSTSETUP will only allow one active OS/2 partition per version. Partitions created on non-boot drives will not be available for use.

INSTALLATION

The installation for OS/2 is quick and painless. The only deviation from the standard OS/2 installation is taking the DISK01.SYS for your adapter and the version of OS/2 from the appropriate sub-directory of the OS/2 directory on the SST Utilities I Diskette and copying this file to the root of a backup of the MICROSOFT OS/2 Installation diskette. Put the new installation disk in drive A: and power on the system. If you have a selection of bootable partitions, be sure to select the OS/2 partition. From this point installation procedes as usual. Be aware that the first time you boot with the OS/2 Installation diskette in floppy drive A:, there may be an inordinate delay before anything appears to happen. Give the system some time before assuming that it is locked.

High Performance File System

If you intend to use the High Performance File System offered by OS/2 v1.2, its use is fully supported on SST systems. Note, however, that use of the HPFS effectively precludes use of the OS/2 DOS Dual Boot function.

DUAL-BOOT Installation

1) Create an SST bootable OS/2 partition using SSTSETUP.

2) Place a bootable DOS floppy in drive A: and close the door.

3) Re-boot the machine.

4) Select the OS/2 partition from the SST SelectOS menu.

5) When you reach the A: prompt, "FDISK" drive C:. Be sure to use all available space in the SST OS/2 partition for the primary or primary and extended logical partition(s).

6) Format each DOS fdisk partition created. Be sure to use "*FORMAT C: /S*" for the primary partition to transfer the system files.

7) On the primary partition (drive C:), create a CONFIG.SYS file which contains the lines:

        DEVICE = C:\DOS\SSTBIO.SYS
        DEVICE = C:\DOS\SSTDRIVE.SYS
        SHELL = C:\DOS\COMMAND.COM /P

and an AUTOEXEC.BAT file which contains the lines:

        SET COMSPEC = C:\DOS\COMMAND.COM
        COPY C:\DOS\COMMAND.COM C:\DOS > NUL

8) Type:

        MD C:\DOS (enter)
        COPY C:*. C:\DOS (enter)*

9) Copy the SST DOS files and any other DOS files to the C:\DOS directory.

10) Copy DISK01.SYS from the SST Utilities disk to the OS/2 Installation disk.

11) Leave the OS/2 Installation disk in drive A: and re-boot the machine.

12) Select OS/2 from the SST Multi-Boot menu and install OS/2. Enter "*BOOT DOS*" or "*BOOT OS/2*" from the command prompt to switch boot.

Chapter 7:
UNIX/XENIX INSTALLATION

NOTE: The WDATXT-FASST DOES NOT currently support UNIX/XENIX operating systems.

NOTE: You can NOT install the SST system unless you have access to an "up and running" UNIX/XENIX system of the same version you wish to install with all of the necessary software packages installed to build a new kernel .

CURRENTLY SUPPORTED (386 Versions Only)

● INTERACTIVE SYSTEMS UNIX® VERSION 2.X

● SANTA CRUZ OPERATIONS XENIX® SYSTEM V/VERSION 2.2.1 - 2.3.2*

● SANTA CRUZ OPERATIONS UNIX SYSTEM V/VERSION 3.2X

● AT&T UNIX VERSION 3.2

● INTEL UNIX VERSION 3.2

*
With SCO XENIX, you MUST install the COMPLETE Development System to install a boot device.

Contents

SSTSETUP AND UNIX/XENIX

To prepare your SCSI fixed hard drive, boot from a DOS diskette and run SSTSETUP.EXE from the SST DOS Installation Disk. When the menu is given for the type of partition, choose the appropriate operating system and you will be prompted to highlight the vendor name. You will then be asked whether the partition will be bootable. You may only have one active bootable partition per operating system; that is, only one SCO XENIX partition may be active and bootable per drive and only one ISC UNIX partition may be active and bootable per drive, etc. If you attempt to create more than one bootable partition per vendor type, any earlier created bootable partition will be rendered inactive. For more information on active and inactive partitions, please see Chapter 4.
NOTICE: If you intend to use removable media such as Syquest or Magneto Optical drives under the *sst* extended hard disk driver (non-boot drive) under UNIX or XENIX, DO NOT use SSTSETUP or *dutil* to prepare the cartridges. SST partitioning is only supported on removable media for the *hd* boot driver under UNIX and XENIX.

INSTALLATION

You should receive with the SST software kit a high-density diskette containing the following UNIX/XENIX device drivers:

- AT&T UNIX Driver for Version 3.2

- SCO XENIX Driver for Version 2.3

- SCO UNIX Driver for Version 3.2

- INTERACTIVE SYSTEMS UNIX Driver for Version 2.x

- INTEL UNIX Driver for Version 3.2

If you did not receive the SST UNIX/XENIX diskette please contact Columbia Data Products, Inc. Technical Support.

The SST drivers are a set of device drivers which make up the Standard Device Level Protocol (SDLP) environment. SDLP is a standard interface which allows device drivers and applications to talk with devices without having to know the specific hardware details about the devices. In other words, there is a standard set of commands, such as read, write, rewind, size, type, etc., which is generic for the driver/application. All of the hardware specific details are handled by the *sdlpfm.o* driver.

At present, for the UNIX/XENIX operating systems, only SCSI devices and the Western Digital 7000-FASST SCSI host adapter are supported. In the future, other types of devices and controllers will be added to the SDLP environment.

For more detailed information on UNIX/XENIX device drivers and utilities, refer to the DRIVER INFORMATION section of this chapter.

The SDLP environment for the UNIX/XENIX operating systems is comprised of the following drivers and programs :

scsiprim.o :

 The Host Adapter Channel (HAC) driver. This module is the low level module which actually talks to the host adapter. This module is mandatory for all SST driver configurations.

sdlpfm.o :

 The *sdlpfm* (function manager) driver. This module is the driver/application interface module. All drivers and applications go through this module to talk to a device. This module is the only module which talks directly to the HAC module and is mandatory for all SST driver configurations.

hd.o :

> The hard disk boot driver. This driver allows the UNIX/XENIX system to reside on and boot from a SCSI hard disk. It replaces the original operating system's AT Winchester boot hard disk driver.

sst.o :

> The SST extended hard disk driver. This driver allows you to attach up to seven hard disks to the system and create up to 256 partitions/file systems which can be accessed by the system.

seq.o :

> The sequential device (tape) driver. This driver allows you to attach as many as seven tape devices to the system and access them through a CPIO/TAR/DD interface.

worm.o :

> The WORM driver. This driver allows you to attach as many as seven WORM devices to the system and access them through a CPIO interface.

wormio :

> *wormio* is an application program which allows you to create an ASCII header that sits on top of each CPIO that goes out to a WORM device. These headers can be examined through the program to select which CPIO you want to read back in.

cdrom :

> *cdrom* is an application program which allows you to see a CD-ROM as if it were a mountable file system. You are able to view directories and files on the CD and copy files onto your hard drive. This program views the files in the format in which they reside on the CD; therefore, if they are not in an ASCII format (i.e., they are crunched), they will appear as garbage.

dutil :

> *dutil* is an application program which allows you to see and manipulate all of the SCSI devices controlled by the SDLP kernel. This is a very powerful utility because it sees each device as a raw (character) device. **Great care should be taken when using this utility as permanent data loss could result.** Some of the functions included in this utility are : read, write, format, partition edit, rewind, erase, etc.

setdos :

> *setdos* is a utility which replaces the normal DOS partition access utilities to access your SST DOS partitions using the DOS under UNIX/XENIX utilities for SCO UNIX 3.2X, SCO XENIX 2.3X, and ISC UNIX 2.X.

The installation of the SST drivers can be done either manually or, for some versions, with the completely automated script files included with the drivers. The manual installation is somewhat complicated, and we don't recommend it for the UNIX/XENIX novice. Complete automatic and manual instructions are supplied with the drivers in README files (all README files are at the end of this chapter). There are a few things you should note before attempting either installation.

> **IF YOU ARE USING THE SST SYSTEM AS THE BOOT DEVICE REFER TO APPENDIX D FOR ADDITIONAL INSTRUCTIONS.**

> **IF YOU ARE UPGRADING YOUR SST SYSTEM, YOU MUST FIRST COMPLETELY DE-INSTALL THE EXISTING SST SYSTEM. IF YOU DO NOT DE-INSTALL, THE NEW SSTCONFIG SCRIPT WILL NOT FUNCTION PROPERLY. IF YOU ORIGINALLY INSTALLED THE SST SYSTEM WITH SSTCONFIG, YOU MAY DE-INSTALL IT USING SSTCONFIG, OR YOU MUST DO THE DE-INSTALL MANUALLY, WHICH WILL RETURN YOUR SYSTEM DEVELOPMENT AND OPERATING SYSTEM FILES TO THEIR ORIGINAL STATE.**

Boot your system and log in as *"root"*. Place the SST UNIX/XENIX diskette into the drive. Type in the following commands :

 # cpio -ivcumdB < /dev/install

This command will copy the following files into the /tmp directory:

in.att.sst.z
in.sco.sst.z
in.scou.sst.z
in.isc.att.z
readme.sst
installsst

 # cd /tmp
 # ./installsst

The *installsst* script will ask you which operating system you will be using. Then unpack the appropriate ".z" file and copy the unpacked files to the /usr/sst directory. You will then be given the option of automatic installation or manual installation. If you choose to use the automatic installation script, everything will be done for you.

THERE ARE MANY UTILITIES AVAILABLE UNDER THE UNIX/XENIX ENVIRONMENT. FOR AN OVERVIEW, PLEASE CONSULT APPENDIX H: Software Reference FOR A DETAILED LISTING.

DRIVER INFORMATION

Hard Disk Operation

There are two modes of operation for use with the hard disk drivers; OEM mode and SST mode. OEM mode will use an entire disk as a logical drive; whereas the SST mode will use an SST UNIX/XENIX partition as a logical drive. A logical drive can be either an entire physical drive (OEM mode) or an SST UNIX/XENIX partition (SST mode). In either case, each SST logical drive appears to the UNIX/XENIX system as a distinct physical device.

There are currently two device drivers which can access SCSI hard disks - the *hd* boot driver and the SST Extended Hard Disk Driver. The *hd* driver can support as many logical drives as UNIX/XENIX allows (often four), and the SST Extended Hard Disk Driver can support up to 256 logical drives. Support for DOS under UNIX/XENIX is the standard support if you are using OEM mode. For SST mode, the SST DOS partitions can only be accessed under SCO XENIX 2.3X, SCO UNIX 3.2X, and ISC UNIX

2.X. For more information on using DOS under UNIX/XENIX with SST DOS partitions, consult the *setdos* section of this chapter.

OEM Mode Operation

In this mode, the drivers will use the entire disk as a logical drive. Do not create ANY SST partitions on the disk. The disk will be set up as a typical UNIX/XENIX disk.

SST Mode Operation

SST UNIX/XENIX partitions can be created from a DOS or a UNIX/XENIX environment. Under a DOS environment, partitions can be created using the utility SSTSETUP.EXE. Under a UNIX/XENIX environment, UNIX/XENIX partitions can be created using the *dutil* utility. Only the first active bootable UNIX/XENIX partition, and all active non-bootable UNIX/XENIX partitions will be seen by the *hd* driver. The SST Extended Hard Disk Driver will only see active non-bootable UNIX/XENIX partitions that have not been set up by the UNIX/XENIX disk adding utilities. For more information on the hard disk drivers, consult the appropriate DRIVER INFORMATION found in this chapter. If multiple drives are attached to the system, a mixture of SST mode and OEM mode drives is supported.

HD Boot Driver

If the *hd* driver is installed and there is no hard drive found at Target ID 0, the system will panic. If there is a hard drive at Target ID 0, the *hd* driver will search for a suitable logical drive to use as the boot drive. If the SST partitioning scheme is found on the drive, the driver will search for a bootable UNIX/XENIX partition and, if none is found the system will panic. If no SST partitioning scheme is found, the driver will assume OEM mode and use the whole drive. The *hd* driver can support as many logical drives as UNIX/XENIX will allow. The number of logical drives found by the *hd* driver which can potentially be controlled by the *hd* driver will be printed to the screen at boot time. This number will also include all of those logical drives seen by the SST Extended Hard Disk Driver.

> **WARNING :** The hd driver and the UNIX/XENIX disk adding utilities have no way of knowing if a logical drive is currently being used by the SST Extended Hard Disk Driver. Adding a logical drive to the hd driver could potentially overwrite a previously created file system that is currently in use by the SST Extended Hard Disk Driver. To avoid this data loss, we recommend that you either add all logical devices to the hd driver and reboot the system before using the SST Driver, or remove all of those logical drives currently in use by the SST driver from the system. These logical drives can be removed from the system by partition deactivation if they are SST partitions or by physically removing the drive from the system. The system must be rebooted to inform the drivers that the logical drives have been removed.

A logical drive can be added to the *hd* driver using the standard UNIX/XENIX disk adding utilities. All of the file systems and UNIX/XENIX internal partitions for all logical drives controlled by the *hd* driver will be automatically created for you, either during the normal UNIX/XENIX hard disk installation or when you invoke the disk-adding utilities. After the logical drive has been added to the *hd* driver through the disk-adding utilities, it is ready to use. However, until you re-boot the system, the SST Extended Hard Disk Driver can still see the logical drive. If you intend to add any drives to the SST driver as well, you must first reboot the system because, once a logical drive has been added to the *hd* driver, it can no longer be seen by the SST driver.

SST Extended Hard Disk Driver

The SST Driver will scan all hard drives found on the SCSI bus. If the SST partitioning scheme is found on a drive, the driver will search for UNIX/XENIX nonbootable partitions and if no suitable partitions are found, or if the SST Driver finds an FDISK partitioning scheme on block 0 of the drive (OEM mode), the drive will be ignored by the SST Driver. Each non-bootable SST partition that has not been added to the *hd* driver, and/or physical drive with no SST of FDISK partitioning scheme found will be set up as a logical drive in the SST Driver. When the system is booted, the number of logical drives found will be printed to the screen. Each logical drive found will be assigned a minor unit number. The minor unit numbers are assigned in a sequential fashion, starting with 0 for the first logical drive found. There is a limit of 256 logical drives supported by the SST Driver. These logical drives can

be accessed by creating a node and a file system for each, and the file system can then be mounted. When making the nodes, start with minor unit number 0 and increment by 1 for each logical drive. If you are using the auto-installation script the first four nodes (*sstb0, sstb1, sstb2*, and *sstb3*) will be created for you.

IMPORTANT NOTE: For this example, we are using major unit number 36. You should use the major unit number which was assigned to the SST driver for your system. If you used the auto-configuration script, the appropriate major unit numbers for our drivers in your system can be found in the ASCII file /usr/sst/muns.

Example (for two logical drives) :

Under XENIX Environments

```
# mknod /dev/sstb0 b 36 0 (enter)
# mkdir /usr/sst0 (enter)
# mkfs /dev/sstb0 20480  1  400 (enter)
    Note: 20480 = # of 1K blocks e.g. 20 MB = 20 * 1048576 / 1024 = 20480.
# mount /dev/sstb0 /usr/sst0 (enter)


# mknod /dev/sstb1 b 36 1 (enter)
# mkdir /usr/sst1 (enter)
# mkfs /dev/sstb1 30720  1  400 (enter)
    Note: 30720 = # of 1K blocks e.g. 30 MB = 20 * 1048576 / 1024 = 30720.
 # mount /dev/sstb1 /usr/sst1 (enter)
```

Under UNIX Environments

```
# mknod /dev/sstb0 b 36 0 (enter)
# mkdir /usr/sst0 (enter)
# mkfs /dev/sstb0 40960 1 400 (enter)
    Note: 40960 = # of 512 byte blocks e.g. 20 MB = 20 * 1048576 / 512 = 40960.
 # mount /dev/sstb0 /usr/sst0 (enter)

# mknod /dev/sstb1 b 36 1 (enter)
# mkdir /usr/sst1 (enter)
# mkfs /dev/sstb1 61440  1  400 (enter)
    Note: 61440 = # of 512 byte blocks e.g. 30 MB = 30 * 1048576 / 512 = 61440.
```

SEQ Operation

In order to use the *seq* (tape) driver, you must have the tape drive(s) up and running when the system boots. The drive(s) can reside at any unused target ID. You must first create a node for each tape drive. Then you can access the tape drives using the UNIX/XENIX utilities CPIO, TAR, and DD. The minor unit numbers are assigned in a sequential fashion, starting with 0 for the first tape device found up to minor unit number 15. The tape driver will automatically rewind the tape on close. By adding certain values to the minor unit number and creating a new node with that number for the minor unit number, you can add the following features :

add 16 :

> The tape device will automatically be forced into variable block mode if the device supports it.

add 32 :

> The tape driver will not issue a rewind command.

add 64 :

> The tape device will be forced into 512-byte block size with a density of 1600 BPI if supported by the device.

add 128 :

> The tape device will be forced into 512-byte block size with a density of 6250 BPI if supported by the device.

If you wish to set up your tape device to a block size or density that is not supported by a node, you can do so by setting up the device with the *dutil* utility and then using the regular rewinding or non-rewinding node. For more information on the *dutil* utility, consult the *dutil* section later in this chapter.

If you run the auto-installation script to install the SST system, the four most common nodes for the first two sequential devices using the *seq* driver will be created for you (*seq0, seqV0, seqN0, seqNV0, seq1, seqV1,*

seqN1 and *seqNV1*)

IMPORTANT NOTE: For this example, we are using major unit number 37. You should use the major unit number which was assigned to the SEQ driver for your system. If you used the auto-configuration script, the appropriate major unit numbers for our drivers in your system can be found in the ASCII file /usr/sst/muns.

Example Nodes (for two tape drives) :

Tape Device 0

> *# mknod /dev/seq0 c 37 0 (enter) /* rewinding */*
> *# mknod /dev/seqV0 c 37 16 (enter) /* rewinding variable block */*
> *# mknod /dev/seqL0 c 37 64 (enter) /* rewinding low-density */*
> *# mknod /dev/seqH0 c 37 128 (enter) /* rewinding high-density */*
> *# mknod /dev/seqN0 c 37 32 (enter) /* non-rewinding */*
> *# mknod /dev/seqNV0 c 37 48 (enter) /* non-rewinding variable */*
> *# mknod /dev/seqNL0 c 37 96 (enter) /*non-rewinding low-density*/*
> *# mknod /dev/seqNH0 c 37 160 (enter) /* non-rewinding high-density*/*

Tape Device 1

> *# mknod /dev/seq1 c 37 1 (enter) /* rewinding */*
> *# mknod /dev/seqV1 c 37 17 (enter) /* rewinding variable block */*
> *# mknod /dev/seqL1 c 37 65 (enter) /* rewinding low-density */*
> *# mknod /dev/seqH1 c 37 129 (enter) /* rewinding high-density */*
> *# mknod /dev/seqN1 c 37 33 (enter) /* non-rewinding */*
> *# mknod /dev/seqNV1 c 37 49 (enter) /* non-rewinding variable */*
> *# mknod /dev/seqNL1 c 37 97 (enter) /* non-rewinding low-density */*
> *# mknod /dev/seqNH1 c 37 161 (enter) /* non-rewinding high-density*/*

CD-ROM Operation

In order to use the CD-ROM program, you must have the CD-ROM drive(s) up and running when the system boots. The drive(s) can reside at any unused target ID. A user program called *cdrom* is supplied on the UNIX/XENIX disk which allows you to view the directory tree, view a directory, view a file on the CD-ROM, or copy a file from the CD-ROM to your hard drive. Since there are no installable drivers for the CD-ROM, you do not have to create any CD-ROM nodes.

However, you must create a SDLP character node called /*dev/sdlp0*/, with the same major unit number that you created the sdlp driver with, and minor unit number 0. If you run the auto-installation script to install the SST system the node for the SDLP driver (*sdlp0*) will be created automatically.

IMPORTANT NOTE: For this example, we are using major unit number 35. You should use the major unit number which was assigned to the SDLPFM driver for your system. If you used the auto-configuration script, the appropriate major unit numbers for our drivers in your system can be found in the ASCII file /usr/sst/muns.

Example SDLP Node :

mknod /dev/sdlp0 c 35 0 (enter)

WORM Operation

In order to use the WORM driver, you must have the WORM drive(s) up and running when the system boots. The drive(s) can reside at any unused target ID. A different node must be made for each WORM drive, and then you can CPIO to that node. A user program called *wormio* is supplied on the UNIX/XENIX disk, that allows you to write an ASCII header to the beginning of each CPIO that you write to the WORM. The program will allow you to select which I/O header you want to be the next CPIO read operation to come from the WORM. In order to run the user program, you must create a WORM character node called /*dev/worm0*/, with the same major unit number you created the WORM driver with, and minor unit number 0. If you run the auto-installation script to install the SST system the node for the WORM driver (*worm0*) will be created automatically.

IMPORTANT NOTE: For this example, we are using major unit number 38. You should use the major unit number which was assigned to the WORM driver for your system. If you used the auto-configuration script, the appropriate major unit numbers for our drivers in your system can be found in the ASCII file /usr/sst/muns.

Example WORM Nodes (for two WORM drives) :

> # *mknod /dev/worm0 c 38 0 (enter)*
> # *mknod /dev/worm1 c 38 1 (enter)*

dutil

If you run the auto-installation script to install the SST system the node for
the SDLP driver (*sdlp0*) will be created automatically.

> WARNING : This utility has the ability to access each of the
> SCSI devices controlled by the SDLP system as a raw device.
> Great care should be taken when   using   this   utility as
> permanent data loss could result.

> IMPORTANT NOTE: For this example, we are using major
> unit number 35. You should use the major unit number which
> was assigned to the SDLPFM driver for your system. If you
> used the auto-configuration script, the appropriate major unit
> numbers for our drivers in your system can be found in the
> ASCII file /usr/sst/muns.

Example SDLP Node :

> # *mknod /dev/sdlp0 c 35 0 (enter)*

This utility will first display a list of the devices found by the SDLP
kernel, their type, and number of blocks (if applicable). You are
prompted to select a device. When a selection is made, various infor-
mation (block, size, vendor) will be printed to the screen with a menu
of functions supported for that device. The functions supported by this
utility are :

1) SST Partition Information

   Devices Supported :

   Direct Access
   Removable Direct Access

Write Once Read Many (WORM)

This function prints all of the current SST partition information for a selected device to the screen.

2) Partition Editor

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)

This function allows you to create, delete, examine, and activate/deactivate SST UNIX/XENIX partitions on a selected device.

3) Change Parameters

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)
Sequential Access
Read Only Direct Access (CDROM)

This function allows you to change the density code and the block size of a selected device.

4) Read

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)
Sequential Access
Read Only Direct Access (CDROM)

This function allows you to read blocks of data from a selected device. If the device is direct access, you will be allowed to choose which block to start reading from. You will also be allowed to select where in the user buffer to read into. The user buffer for the I/O is 64K in size.

5) Write

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)
Sequential Access

This function allows you to write blocks of data from the user buffer to a selected device. If the device is a direct access device, you will be allowed to choose which block to start writing to. You will also be allowed to select where in the user buffer to write from. The user buffer for the I/O is 64K in size.

6) Buffer

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)
Sequential Access
Read Only Direct Access (CDROM)

This function allows you to view and manipulate the 64K user buffer.

7) Format

Devices Supported :

Direct Access
Removable Direct Access
Write Once Read Many (WORM)

This function allows you to do a low level format on a selected device. The format is a general format, only allowing you to change the interleave value. ALL DATA WILL BE DESTROYED.

8) Zero

Devices Supported:

Direct Access
Removable Direct Access
Write Once Read Many (WORM)

This function allows you to write zeros to every block on a selected device. ALL DATA WILL BE DESTROYED.

9) Rewind

Devices Supported:

Sequential Access

This function allows the user to issue a rewind command to a selected device.

10) Filemark

Devices Supported:

Sequential Access

This function allows you to either write a filemark to this device or read until a filemark or end of medium is encountered on a selected device.

11) Retension

Devices Supported:

Sequential Access

This function allows the user to issue a retention command to a selected device.

12) Erase

Devices Supported :

Sequential Access

This function allows you to issue an erase command to a selected device. ALL DATA WILL BE DESTROYED.

setdos

If you are using the SDLP system in OEM mode only, the DOS under UNIX/XENIX will be the same as the conventional UNIX/XENIX and user information can be found in the appropriate UNIX/XENIX manuals. If you are using the SST partitioning scheme, at this point you can only access your SST DOS Partitions under SCO XENIX 2.3.X, SCO UNIX 3.2.X, and ISC UNIX 2.X in the following manner :

SCO UNIX/XENIX

In SCO we have the ability to support four logical drives. For each of these drives the device name which access the DOS partitions are *hd0d, hd1d, hd2d,* and *hd3d*. The SST DOS partitions are set up on those logical drives which are currently unused. The boot device uses up the first one (*hd0d*), and each additional device that you add to the hd driver will use up another, so if you have only one logical drive supported by the hd driver, you have the ability to access three SST DOS partitions at the same time; if two logical drives are supported by the hd driver, you have the ability to access two SST DOS partitions at the same time, and so on. To access these partitions, you use the XENIX DOS utilities with that device name. For example : *dosdir /dev/hd2d.*

You can go into the */etc/default/msdos* file and change the lines to:

C = */dev/hd1d*
D = */dev/hd2d*
E = */dev/hd3d*

and do "*dosdir d:*", etc.

These nodes may not already exist. If not, you can create them by entering the following:

```
mknod /dev/hd1d b 1 119
mknod /dev/hd2d b 1 183
mknod /dev/hd3d b 1 247
```

The *setdos* utility will allow you to view all SST DOS partitions seen by the hd driver, show you which SST DOS partitions are currently set up to which device node, and allow you to change which SST DOS partition is set up to which device node. This will allow you to access most of your SST DOS partitions.

ISC UNIX

In ISC we have the ability to support eight logical drives. The SST DOS partitions are set up on those logical drives which are currently unused. The boot device uses up the first one. We don't use the second one for SST DOS partitions. Every additional logical drive that you add to the hd driver will use up another device node, so if you have only one or two logical drives supported by the hd driver, you have the ability to access six SST DOS partitions at the same time. If three logical drives are supported by the hd driver, you have the ability to access five SST DOS partitions at the same time, and so on. The two ways to access these DOS partitions are through the *dossette* utilities and by mounting the partition as a file system.

In order to use the *dossette* utilities, you must run the *setdos* utility and enable the dossette utilities. When the *dossette* utilities are enabled, some of the other UNIX utilities which directly access physical sector 0 of the logical device (such as FDISK) will not function correctly so do not use them. While the *setdos* utilities are enabled, the *setdos* utility will also allow you to set up which SST DOS partitions will be accessed as c: and d:. Once you have enabled the *dossette* utilities, you can use them as you normally would.

Example :

> *dosdir c:*
> *dosdir d:*

The second way to access the SST DOS partitions is to mount the device as a file system and access it directly or run VPIX to access it. There are four nodes that are necessary for each logical drive in order mount the SST DOS partitions. These nodes may not already exist. If not, you can create them by entering:

```
mknod /dev/dsk/2p0 b 0 160
mknod /dev/rdsk/2p0 c 0 160
mknod /dev/dsk/2p1 b 0 161
mknod /dev/rdsk/2p1 c 0 161

mknod /dev/dsk/3p0 b 0 176
mknod /dev/rdsk/3p0 c 0 176
mknod /dev/dsk/3p1 b 0 177
mknod /dev/rdsk/3p1 c 0 177

mknod /dev/dsk/4p0 b 0 192
mknod /dev/rdsk/4p0 c 0 192
mknod /dev/dsk/4p1 b 0 193
mknod /dev/rdsk/4p1 c 0 193
```

You can create nodes all the way to *7p0* and *7p1*, by adding 16 to the minor unit number each time. The *setdos* utility will allow you to view all SST DOS partitions seen by the hd driver, show you which SST DOS partitions are currently set up to which device nodes, and allow you to change which SST DOS partition is set up to which device node. This will allow you to access most of your SST DOS partitions.

Custom IRQ Settings in UNIX/XENIX

If you are using the SST system for the UNIX/XENIX operating system you may choose a different IRQ vector for the FASST card. You **MUST** use the manual installation technique to select a custom IRQ vector. If you are updating an existing installation, run *idbuild* or *link_xenix* to build the new kernel.

1) Refer to Chapter 1, page 8 and select a new IRQ line. Be certain that no other drivers in the system are claiming the new IRQ or your new kernel generation will fail with a. "Interupt Vector Conflict" error.

2) Adjust the jumpering on your SST card to reflect the new selection.

3) While installing the SST drivers it will be necessary to edit the *scsiprim* file entry to reflect the new IRQ.

> A) **UNIX:** Go to the */etc/conf/sdevice.d* directory and edit the file *scsiprim*. Change the 15 in the third column to the new correct IRQ.

> B) **XENIX:** See page 50 of this chapter for detailed instructions on the *configure* command in XENIX. When you come to the step in the manual installation that calls for:

> # ./configure -a primintr -c -m 34 -l 5 -v 31

> Substitute the correct argument for the -v switch for your new IRQ in place of the 31 for IRQ 15. This would be the IRQ line number plus sixteen (16). For example, to select IRQ 12, the -v argument would be 28.

4) Continue on with the manual installation and build your new kernel.

NOTE: You may be limited in the other operating systems you may access with the SST system if you change your IRQ configuration. OS/2 will only support IRQ 15, and Novell will only support 10, 11, 12 or 15.

UNIX/XENIX Installation Instructions

SCO UNIX
INSTALLATION PROCEDURE FOR THE SST SCO UNIX
UNIX SYSTEM V/386 Release 3.2

IN ORDER TO INSTALL THE SST SYSTEM ON YOUR SCSI
HARD DRIVE: YOU MUST HAVE AN UP AND RUNNING SCO
UNIX SYSTEM, WITH COMPLETE OPERATING SYSTEM
PACKAGE INSTALLED.

IF YOU ARE UPGRADING YOUR SST SYSTEM, YOU MUST
FIRST COMPLETELY   DE-INSTALL   THE   EXISTING   SST
SYSTEM.   IF   YOU   DO   NOT DE-INSTALL, THE NEW
SSTCONFIG SCRIPT WILL NOT FUNCTION PROPERLY. IF
YOU ORIGINALLY INSTALLED THE SST SYSTEM WITH
SSTCONFIG,   YOU   MAY   DE-INSTALL   IT   USING
SSTCONFIG, OR YOU MUST DO THE DE-INSTALL MANUALLY,
WHICH WILL RETURN YOUR SYSTEM DEVELOPMENT AND
OPERATING SYSTEM FILES TO THEIR ORIGINAL STATE.

AUTO-INSTALLATION

The auto-installation for SCO UNIX is a simple procedure that will automatically install all of the necessary files, build a new kernel, and copy it to a bootable UNIX floppy disk for you. The installation has two steps. In the first step, all of the SST files are copied into the /usr/sst directory. In the second step the new system is configured and built, and the bootable UNIX floppy disk is set up for you if you desire. The second step is accomplished by running an executable script file called sstconfig.

The sstconfig file is an executable shell script file that will allow you to configure a new SCO UNIX kernel with only those SST drivers that you want added into your system. This script file will automatically build a new kernel for you, format a floppy if you like, make a copy of the original UNIX bootable N1 floppy, and copy the new kernel onto the new floppy. "sstconfig" will be placed in the directory /usr/sst along with other files that are necessary for the system configuration.

The *sstconfig* script can be run any time you want to add or remove one or more of the SST drivers. If you are not going to copy the new kernel to a bootable floppy, answer no to that question. The new kernel will be left in the */usr/sst* directory and will be renamed *unix.scsi*.

Note that if you answer YES to the SCO UNIX "Do you want this kernel to boot by default" question, the installsst/sstconfig script will terminate abnormally. In the case that you are using a host system to build a new BOOT/N1 disk, that system will not reboot. Answer NO to this question unless you are sure.

The procedure for installing the SST system into your SCO UNIX system with the auto-install is as follows :

1) Place the SST UNIX/XENIX high-density diskette into the drive and type the following commands :

   # cpio -ivcumdB < /dev/install
   # cd /tmp
   # ./installsst

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer YES to the auto-install question, and the *sstconfig* script will be executed for you.

2) The *sstconfig* script will prompt you for all necessary information and build the new kernel based on your reponses to YES or NO questions.

3) Power down the system.

   # shutdown -g0 -y

Install the SST card along with the SCSI device(s) into your system, if you have not already done so. See Chapters 1 and 3 for details.

Note : In order to use the hd BOOT Driver, the boot drive must be set to target ID   0.   The   remaining   devices can be set to any other unique target ID.

---

4) If you ARE going to use the hd BOOT Driver, at power on you must run your system CMOS setup utility and tell the system that there are

NO hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal SCO UNIX hard disk installation procedure.

NOTE : There are a few things you should make note of during the normal SCO UNIX installation.

a) Select the fully configurable option.

b) Select the "default disk parameters" option, even if they do not match the manufacturer's specifications.

c) Support for DOS under UNIX is the standard support for SCO UNIX if you only using OEM mode. For SST mode DOS under UNIX is supported through the *setdos* utility documented elsewhere in this manual. If you are using SST mode, during the FDISK section of the UNIX install, select "Use entire disk for Unix" as SCO will see the SST SCO UNIX partition as a complete physical device and the FDISK will not affect any other SST partitions. If you create a DOS area during the FDISK process, that DOS area will not be available from any SST DOS partition or visa versa.

d) If you are asked to enter bad blocks, just escape out of that section as SCSI devices are logically defect free.

5) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section at the end of this document.

MANUAL INSTALLATION

> **PLEASE READ ALL COMMENTS AND STEPS BEFORE AND DURING THE INSTALLATION!(comments are denoted by /* */)**

1) Make sure that the system has all of the necessary software installed to build a new kernel.

2) Bring up the system and login as "*root*"

3) Insert the SST UNIX/XENIX high-density diskette into the floppy drive and type in the following commands :

7-23

```
# cpio -ivcumdB < /dev/install
# cd /tmp
# ./installsst
```

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer NO to the auto-install question.

NOTE: Before you begin the manual installation we strongly recommend that you make backup copies of the */etc/conf/sdevice.d* and */etc/conf/cf.d* directories. That way should you want to return your system to its original state at a later time you need only erase the contents of both directories and copy in the original files from the backup directories you created.

```
# cd /etc/conf (enter)
# mkdir cf.orig (enter)
# cp cf.d/* cf.orig (enter)
# mkdir sdevice.original (enter)
# cp sdevice.d/* sdevice.original (enter)
```

Should you wish to restore your dirctories later, type:

```
# cd /etc/conf (enter)
# rm cf.d/* (enter)
# cp cf.original/* cf.d (enter)
# rm sdevice.d/* (enter)
# cp sdevice.original/* sdevice.d (enter)
```

```
/*NOTE : Go into the sdevice.d directory and turn on all of the      */
/* SST drivers that you want installed into your system.             */
/* If you ARE going to be using the hd BOOT driver, you must         */
/* go into the sdevice.d directory and turn off all of the standard  */
/* system disk drivers that you will not be using.                   */
```

4) For every SST driver that you want installed into your system, you must go into the */etc/conf/sdevice.d* directory and create a file with that driver's name.

Note: The *scsiprim* and *sdlpfm* drivers are mandatory if you want to use any of the new drivers. All of the other drivers can be optionally installed.

Example using the sdlpfm file :

```
#   cd /etc/conf/sdevice.d (enter)
#   vi sdlpfm (enter)
```

enter the line:

```
sdlpfm    Y    1    0    0    0    0    0    0    0
```

Create a file named *scsiprim* and enter the line:

```
scsiprim    Y   56   5    1   15   350   353    0    0
```

Create a file for each of the folowing drivers that you wish to use with the shown contents:

```
sst      Y   56    0    0    0    0    0    0    0
seq      Y   56    0    0    0    0    0    0    0
worm     Y   56    0    0    0    0    0    0    0
```

/* You must edit "wd1" so that it does not conflict with scsiprim */

```
#   cd /etc/conf/sdevice.d (enter)
#    vi wd1 (enter)
```

Before: wd1   Y   0   0   0   0   0   0   0 0
After: wd1   Y   0   0   0   0   0   0   0 0

If you are going to be using the hd BOOT driver, turn off all of the standard system disk drivers by changing the "Y" in the second column of each driver's *sdevice.d* file. The files that must be switched off are: *wd, wd0, wd1, Sdsk, ad*
Example using the file *wd*:

```
#   vi wd (enter)
```

Before: wd   Y   0   0   0   0   0   0   0 0
After: wd   N   0   0   0   0   0   0   0 0

/*NOTE : If you ARE going to be using the *hd* BOOT driver, you */
/* must go into the /etc/conf/sdevice.d directory and change the   */
/* hd file entry, go into the /etc/conf/mdevice file and change   */
/* the hd entry, and go into the /etc/conf/pack.d/hd directory   */
/* and move the file *Driver.o* to hd.driver.o. Then copy   */

/* /usr/sst/hd.Driver.o to /etc/conf/pack.d/hd/Driver.o. If you are   */
/* NOT using the hd BOOT driver, skip 5) and go to 6).   */

5) If you ARE using the BOOT driver:

   # cd /etc/conf/sdevice.d (enter)
   # vi hd (enter)

Before : hd   Y   2   2   2   14   320   32f 0   0
After : hd   Y   1   0   0   0   0   0   0   0

   # cd /etc/conf/cf.d (enter)
   # vi mdevice (enter)
    /hd (enter)

Before : hd   Iocrwi iHobrc hd   0   0   1   2 -1
After : hd   Iocrwi iobrc   hd   0   0   1   1 -1

   # cd /etc/conf/pack.d/hd (enter)
   # cp /usr/sst/hd.Driver.o Driver.o (enter)

/* NOTE : Now you must add the new drivers that you will   */
/* be using to the mdevice file.   */
/* Note : The scsiprim and sdlpfm drivers are mandatory   */
/* if you wish to use any of the SST drivers, all   */
/* other drivers are optional.   */

6) # cd /etc/conf/cf.d (enter)
   # vi mdevice (enter)

Edit the lines for the drivers wd, wd0, wd1 and ad to remove the "r" from
the third column:
Before:

wd	-	ir	wd	0	0	0	0	-1
wd0	ocrwi	iHrobCc	wd0	53	53	1	2	-1
wd1	ocrwi	iHrobCc	wd1	54	54	1	2	-1
ad	iI	iHroCc	aha	34	34	1	2	5

After:

wd	-	i	wd	0	0	0	0	-1
wd0	ocrwi	iHobCc	wd0	53	53	1	2	-1
wd1	ocrwi	iHobCc	wd1	54	54	1	2	-1
ad	iI	iHoCc	aha	34	34	1	2	5

Scroll to the bottom of the file and add the following lines :

scsiprim	-	icoH	prim	0	21	1	56	6
sdlpfm	oi	ico	sdlp	0	22	1	56	-1
sst	ocrwiI	icbo	sst	23	23	1	56	-1
seq	ocrwiI	ico	seq	0	24	1	56	-1
worm	ocrwiI	ico	worm	0	25	1	56	-1
hd	Iocrwi	iobcr	hd	0	0	1	1	-1

```
/* Note : The major unit numbers given to the drivers    */
/* are arbitrary, and can be any unused major            */
/* unit numbers. i.e. the first major unit number        */
/* we  used  in our system was 21 for character and      */
/* 23  for  block. All nodes made for a given            */
/* driver must be  made  with  the  major unit number    */
 /* that you assign it in the mdevice file.              */
/* "cd" to the /etc/conf/pack.d directory and create a directory  */
/* for each SST driver you will be using, then copy the driver    */
/* object file from /usr/sst to the new pack subdirectory.        */
```

```
#   cd /etc/conf/pack.d (enter)
#   mkdir sdlpfm (enter)
#   cp /usr/sst/sdlpfm.Driver.o    sdlpfm/Driver.o (enter)
#   mkdir scsiprim (enter)
#   cp /usr/sst/scsiprim.Driver.o  scsiprim/Driver.o (enter)
```

```
/* Repeat for sst, seq and worm if you have selected these drivers */
```

```
7)  #   /etc/conf/bin/idbuild  (enter)
    #   mcs -d unix (enter)
```

NOTE : At this point, if you are going to copy this new kernel over to the boot floppy, you will have to strip the kernel. The reason for this is that there is not enough room for the new kernel on the floppy. Stripping the kernel will keep some of the UNIX utilities from working, so once installed, the original unstripped kernel should be copied onto the hard disk. Therefore you should make a copy of the original kernel before you strip it. The *strip* utility is found in the Software Development Package.

```
#   cp unix unix.stripped(enter)
#   strip unix (enter)
```

/* If you ARE using the hd BOOT driver, you should   */
/* make a copy of the bootable UNIX installation floppy disk   */
/* (possibly using the *sysadm* facility) and copy the new kernel   */
/* onto it. The following example commands should help you with*/
/* the copy.   */

```
#   mount   /dev/dsk/f0q15d   /mnt   (enter)
#   cp /etc/conf/cf.d/unix   /mnt/unix (enter)
#   umount /mnt (enter)
```

/* Note : If you ARE using the hd BOOT driver, then answer NO */
/* to the query "Do you want this Kernel to boot by default?". */
/* If you don't, the next time you try to boot the drive that you */
/* are currently working on, the new kernel will boot and the   */
/* system will hang or panic.   */

8) Power down the system.

```
#   shutdown -g0 -y
```

Install the 7000-FASST card along with a SCSI drive(s) into your system. See Chapters 1 and 3 for details.

Note : In order to use the HD Boot driver, the boot drive must be set to target ID 0. The remaining drives can be set to any other unique target ID.

---

9) If you ARE going to use the HD BOOT driver, at power on you must run your system CMOS setup utility and tell the system that there are no hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal SCO UNIX hard disk installation procedure.

NOTE : Following are a few things you should make note of during the normal SCO UNIX installation.

a) Select the fully configurable option.

b) Select the "default disk parameters" option, even if they do not match the manufacturer's specifications.

c) Support for DOS under UNIX is the standard support for SCO UNIX if you are using OEM mode. For SST mode DOS under UNIX is supported through the *setdos* utility documented elsewhere in this manual. If you are using SST mode, during the FDISK section of the UNIX install, select "Use entire disk for Unix" as SCO will see the SST SCO UNIX partition as a complete physical device and the FDISK will not affect any other SST partitions. If you create a DOS area during the FDISK process, that DOS area will not be available from any SST DOS partition or visa versa.

d) If you are asked to enter bad blocks, just escape out of that section as SCSI devices are logically defect free.

INTERACTIVE UNIX
SST INSTALLATION PROCEDURE FOR INTERACTIVE UNIX 386/ix
Version 2.X
UNIX SYSTEM V/386 Release 3.2

IN ORDER TO INSTALL THE SST SYSTEM ON YOUR SCSI HARD DRIVE: YOU MUST HAVE AN UP AND RUNNING ISC 2.X UNIX SYSTEM.

IF YOU ARE UPGRADING YOUR SST SYSTEM, YOU MUST FIRST COMPLETELY DE-INSTALL THE EXISTING SST SYSTEM. IF YOU DO NOT DE-INSTALL, THE NEW SSTCONFIG SCRIPT WILL NOT FUNCTION PROPERLY. IF YOU ORIGINALLY INSTALLED THE SST SYSTEM WITH SSTCONFIG, YOU MAY DE-INSTALL IT USING SSTCONFIG, OR YOU MUST DO THE DE-INSTALL MANUALLY, WHICH WILL RETURN YOUR SYSTEM DEVELOPMENT AND OPERATING SYSTEM FILES TO THEIR ORIGINAL STATE.

Automatic Installation

The auto-installation for ISC 2.X UNIX is a simple procedure that will automatically install all of the necessary files, build a new kernel, and copy it to a bootable UNIX floppy disk for you. The installation has two steps. In the first step, all of the SST files are copied into the /usr/sst directory. In the second step the new system is configured and built, and the bootable UNIX floppy disk is set up for you if you desire. The second step is accomplished by running an executable script file called *sstconfig*.

The *sstconfig* file is an executable shell script file that will allow you to configure a new ISC 2.X UNIX kernel with only those SST drivers that you want added into your system. This script file will automatically build a new kernel for you, format a floppy if you like, make a copy of the original UNIX bootable floppy, and copy the new kernel onto the new floppy. *sstconfig* will be placed in the directory /usr/sst along with other files that are necessary for the system configuration. The *sstconfig* script can be run any time you want to add or remove one or more of the SST drivers. If you are not going to copy the new kernel to a bootable floppy, answer NO to that question and the new kernel will be left in the /usr/sst directory and will be renamed *unix.scsi*.

The procedure for installing the SST system into your ISC 2.X UNIX system with the auto-install is as follows :

1) Place the SST UNIX/XENIX high-density diskette into the drive.

2) Type in the following commands :

> # cpio -ivcumdB < /dev/install
> # cd /tmp
> # ./installsst

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer YES to the auto-install question, and the *sstconfig* script will be executed for you.

3) The *sstconfig* script will prompt you for all necessary information and do every thing else for you.

4) Power down the system and install the SST card along with the SCSI device(s) into your system (if you have not already done so).

> # shutdown -g0 -y

> **Note : In order to use the hd BOOT Driver, the boot drive must be set to target ID 0. The remaining devices can be set to any other unique target ID.**

5) If you ARE going to use the HD BOOT Driver, at power on you must run your system CMOS setup utility and tell the system that there are no hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal ISC 2.X UNIX hard disk installation procedure.

NOTE : There are a few things you should make note of during the normal ISC UNIX installation.

a) Answer NO to the reformat question, as the SCSI devices will not need a new format.

b) Enter an interleave factor of 1.

c) Answer YES to the "Do you want to repartition" question. When using OEM mode, you can partition the disk for UNIX and DOS during the FDISK section of the normal ISC 2.X UNIX installation. If you have created an SST ISC UNIX bootable partition, during the FDISK section of the normal ISC 2.X UNIX installation, you should create an FDISK partition using 100% of the disk for UNIX, because UNIX sees an SST ISC UNIX partition as a whole physical disk, and any DOS partition created within that SST UNIX/XENIX partition will not be available if you boot from a DOS SST partition.

d) When it asks for a complete surface analysis, answer NO, and when it asks for any more defects to be added in, answer NO, as SCSI devices are defect free.

6) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section found in this document.

MANUAL INSTALLATION

> **PLEASE READ ALL COMMENTS AND STEPS BEFORE AND DURING THE INSTALLATION!(comments are denoted by /* */)**

1) Make sure that the System Configuration package has been installed.

2) Bring up the system and login as *"root"*.

3) Insert the SST UNIX/XENIX high-density diskette into the floppy drive and type in the following commands :

```
# cpio -ivcumdB < /dev/install
# cd /tmp
# ./installsst
```

The installsst script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer NO to the auto-install question.

NOTE: Before you begin the manual installation we strongly recommend that you make backup copies of the */etc/conf/sdevice.d* and */etc/conf/cf.d* directories. That way should you want to return your system to its original state at a later time you need only erase the

contents of both directories and copy in the original files from the backup directories you created.

```
#  cd /etc/conf (enter)
#  mkdir cf.original (enter)
#  cp cf.d/* cf.original (enter)
#  mkdir sdevice.original (enter)
#  cp sdevice.d/* sdevice.original (enter)
```

Should you wish to restore your dirctories later, type:

```
#  cd /etc/conf (enter)
#  rm cf.d/* (enter)
#  cp cf.original/* cf.d (enter)
#  rm sdevice.d/* (enter)
#  cp sdevice.original/* sdevice.d (enter)
```

```
/* NOTE : If you are NOT using the hd BOOT driver, you      */
/* should re-configure your system (using the kconfig utility) */
/* with the ISC H.P.D.D. Driver.                             */
/* Turn on all of the SST drivers that you want installed in   */
/* your system.                                              */
```

4) For every SST driver that you want installed into your system, you must go into the /etc/conf/sdevice.d directory and create a file with that driver's name.

> Note: The *scsiprim* and *sdlpfm* drivers are mandatory if you want to use any of the new drivers. All of the other drivers can be optionally installed.

Example using the *sdlpfm* file :

```
#  cd /etc/conf/sdevice.d (enter)
#  vi sdlpfm (enter)
```

enter the line:

```
sdlpfm   Y   1   0   0   0   0   0   0   0
```

Create a file named *scsiprim* and enter the line:

```
scsiprim   Y  56   5    1   15   350   353   0     0
```

Create a file for each of the folowing drivers that you wish to use with the shown contents:

```
sst        Y  56   0    0    0    0     0    0     0
seq        Y  56   0    0    0    0     0    0     0
worm       Y  56   0    0    0    0     0    0     0
hd         Y  56   0    0    0    0     0    0     0
```

/* step 5 : If you ARE going to be using the *hd* BOOT driver, you */
/* must go into the */etc/conf/sdevice.d* directory and change the   */
/* *hd* file entry, go into the */etc/conf/mdevice* file and change   */
/* the *hd* entry, and go into the */etc/conf/pack.d/hd* directory   */
/* and move the file *Driver.o* to *hd.driver.o*. Then copy   */
/* */usr/sst/hd.Driver.o* to */etc/conf/pack.d/hd/Driver.o*. If you are */
/* NOT using the *hd* BOOT driver, skip 5) and 6) and go to 7).   */

5) If you ARE using the *hd* BOOT driver:

   # *cd /etc/conf/sdevice.d (enter)*

You must check all of the files listed below, and if they are turned on (denoted by a "Y" in the 2nd column), you must turn them off by changing the "Y" to a "N".

The files are : *gendev, dsk, tape, athd, aha1540, tmc8x0,   gramd* and for ISC v2.2 and later *mcesdi* and *mcst.*

Example using the file *gendev*

   # *vi gendev (enter)*

before :
```
gendev   Y   4   5   1   11   0   0   0   0
gendev   Y   4   5   1   14   0   0   0   0
gendev   Y   4   5   1   15   0   0   0   0
gendev   Y   4   5   1    5   0   0   0   0
```

after :
```
gendev   N   4   5   1   11   0   0   0   0
gendev   N   4   5   1   14   0   0   0   0
gendev   N   4   5   1   15   0   0   0   0
gendev   N   4   5   1    5   0   0   0   0
```

/* NOTE : If you ARE going to be using the *hd* BOOT driver, */
/* you must go into the *cf.d* directory and modify the *sassign* file .*/
/* Before you start, make a copy of the original file. */

6) If you ARE using the *hd* BOOT driver:

    # cd /etc/conf/cf.d (enter)
    # cp sassign sassign.good (enter)
    # vi sassign (enter)

before :

swap	dsk	2
dump	dsk	2
root	dsk	1
pipe	dsk	1

after :

swap	hd	2
dump	hd	2
root	hd	1
pipe	hd	1

/* Step 7 : Now you must add the new drivers that you will */
/* be using to the *mdevice* file. If you ARE going to be */
/* using the *hd* BOOT driver, you must modify some of the */
/* other entries in the *mdevice* file. */
/* Note : The *scsiprim* and *sdlpfm* drivers are mandatory */
/* if you wish to use any of the SST drivers, all */
/* other drivers are optional. */

7) # cd /etc/conf/cf.d (enter)
    # vi mdevice (enter)

Scroll to the bottom of the file and add the following lines :

scsiprim	-	icoH	prim	0	21	1	56	6
sdlpfm	oi	ico	sdlp	0	22	1	56	-1
sst	ocrwiI	icbo	sst	23	23	1	56	-1
seq	ocrwiI	ico	seq	0	24	1	56	-1
worm	ocrwiI	ico	worm	0	25	1	56	-1

/* Note : The major unit numbers given to the drivers */
/* are arbitrary, and can be any unused major */
/* unit numbers. i.e. the first major unit number */

```
/* we used in our system was 21 for character and      */
/* 23 for block. All nodes made for a given            */
/* driver must be made with the major unit number      */
/* that you assign it in the mdevice file.             */
```

If you ARE NOT going to use the *hd* BOOT driver, SKIP to the next step, else now you must modify the following entries in the *mdevice* file to remove the required ('*r*') flag from the 3rd column :

Example using *dsk* and *gendev* :

```
Before : dsk      ocrwi  irobc  dsk_    0    0    1 2    -1
         gendev   I      ir     gendev  0    0    1 4    -1


After :  dsk      ocrwi  iobc   dsk_    0    0    1 2    -1
         gendev   I      i      gendev  0    0    1 4    -1
```

```
/* "cd" to the /etc/conf/pack.d directory and create a directory  */
/* for each SST driver you will be using, then copy the driver    */
/* object file from /usr/sst to the new pack subdirectory.        */
```

```
#   cd /etc/conf/pack.d (enter)
#   mkdir sdlpfm (enter)
#   cp /usr/sst/sdlpfm.Driver.o    sdlpfm/Driver.o (enter)
#   mkdir scsiprim (enter)
#   cp /usr/sst/scsiprim.Driver.o  scsiprim/Driver.o (enter)
```

```
/* Repeat for sst, seq, worm and hd if you have selected them     */
```

```
8) #   /etc/conf/bin/idbuild (enter)
   #   mcs -d unix (enter)
```

```
/* If you ARE using the hd  BOOT  driver, you should         */
/* make a copy of the bootable UNIX installation floppy disk */
/* (possibly using the sysadm facility) and copy the new kernel */
/* onto it. The following example commands should help      */
/* you with the copy.                                       */
```

```
#   mount /dev/dsk/f0q15d /mnt (return)
#   cp /etc/conf/cf.d/unix /mnt/unix (return)
#   umount /mnt (return)
```

```
/* Note : If you ARE using the hd BOOT driver, then delete the  */
/* newly created kernel, or copy it to another name or directory */
```

```
/* or the next time you try to boot the drive you are currently    */
/* working on, the new kernel will boot and the system will hang */
/* or panic.                                                        */
```

```
#    mv unix unix.scsi
```

```
/* Step 9 : Power down the system and install the proper    */
/* hardware                                                  */
```

9) Power down the system.

```
#    shutdown -g0 -y
```

Install the SST card along with the SCSI drive(s) into your system. See Chapters 1 and 3 for details.

Note : In order to use the *hd* Boot driver, the boot drive must be set to target ID 0. The remaining drives can be set to any other unique target ID.

```
/* step 10 : Set up the system if you are using the boot driver  */
```

10) If you ARE going to use the *hd* BOOT driver, at power on you must run your CMOS system setup utility and tell the system that there are no hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal ISC 2.X UNIX hard disk installation procedure.

NOTE : Following are a few things you should make note of during the normal ISC 2.X UNIX installation.

a) Answer NO to the reformat question, as the SCSI devices will not need a new format.

b) Enter an interleave factor of 1.

c) Answer YES to the "Do you want to repartition" question. It is necessary to create an FDISK UNIX partition. When using OEM mode, you can partition the disk for UNIX and DOS during the FDISK section of the normal ISC 2.0X Unix Installation. If you have created an SST ISC UNIX bootable partition, during the

FDISK section of the normal ISC 2.0X UNIX installation, you should create an FDISK partition using 100% of the disk for UNIX, because UNIX sees an SST ISC UNIX partition as a whole physical disk, and any DOS partition created under that SST UNIX/XENIX partition will not be available if you boot from a DOS SST partition.

d) When it asks for a complete surface analysis, answer NO, and when it asks for any more defects to be added in, answer NO, as SCSI devices are defect free.

11) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section found at the beginning of this chapter.

> IN ORDER TO INSTALL THE SST SYSTEM ON YOUR SCSI HARD DRIVE: YOU MUST HAVE AN UP AND RUNNING AT&T OR INTEL UNIX SYSTEM.

> IF YOU ARE UPGRADING YOUR SST SYSTEM, YOU MUST FIRST COMPLETELY DE-INSTALL THE EXISTING SST SYSTEM. IF YOU DO NOT DE-INSTALL, THE NEW SSTCONFIG SCRIPT WILL NOT FUNCTION PROPERLY. IF YOU ORIGINALLY INSTALLED THE SST SYSTEM WITH THE SSTCONFIG, YOU MAY DE-INSTALL IT USING SSTCONFIG, OR YOU MUST DO THE DE-INSTALL MANUALLY, WHICH WILL RETURN YOUR SYSTEM DEVELOPMENT AND OPERATING SYSTEM FILES TO THEIR ORIGINAL STATE.

Automatic Installation

The auto-installation for AT & T or Intel UNIX is a simple procedure that will automatically install all of the necessary files, build a new kernel, and copy it to a bootable UNIX floppy disk for you. The installation has two steps. In the first step, all of the SST files are copied into the */usr/sst* directory. In the second step the new system is configured and built, and the bootable UNIX floppy disk is set up for you if you desire. The second step is accomplished by running an executable script file called *sstconfig*.

The *sstconfig* file is an executable shell script file that will allow you to configure a new UNIX kernel with only those SST drivers that you want added into your system. This script file will automatically build a new kernel for you, format a floppy if you like, make a copy of the original UNIX bootable floppy, and copy the new kernel onto the new floppy. *sstconfig* will be placed in the directory */usr/sst* along with other files that are necessary for the system configuration.

The *sstconfig* script can be run any time you want to add or remove one or more of the SST drivers. If you are not going to copy the new kernel to a bootable floppy, answer no to that question. The new kernel will be left in the */usr/sst* directory and will be renamed *unix.scsi*.

The procedure for installing the SST system into yourUNIX system with the auto-install is as follows :

1) Place the SST UNIX/XENIX high-density diskette into the drive.

2) Type in the following commands :

    # cpio -ivcumdB < /dev/install
    # cd /tmp
    # ./installsst

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer YES to the auto-install question, and the *sstconfig* script will be executed for you.

3) The *sstconfig* script will prompt you for all necessary information and do every thing else for you.

4) Power down the system.

    # shutdown -g0 -y

Install the SST card along with the SCSI device(s) into your system, if you have not already done so.

Note : In order to use the *hd* BOOT Driver, the boot drive must be set to target ID 0. The remaining devices can be set to any other unique target ID.

---

5) If you ARE going to use the *hd* BOOT Driver, at power on you must run your system *setup* utility and tell the system that there are no hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal UNIX hard disk installation procedure.

NOTE : Following are a few things you should make note of during the normal AT & T or INTEL UNIX installation.

a) There is no need to reformat, as SCSI devices will not require a new format.

b) During the FDISK section of the install, it is necessary to create an FDISK UNIX partition. Currently with version 2.0 of the SST

drivers there is no support for DOS under UNIX functions to a DOS (SST or FDISK) partition in SST mode. These DOS under UNIX functions can only be used in OEM mode. SST and OEM modes are described in detail earlier in this chapter. If you are using SST mode, when FDISK asks for percentage of disk to use for UNIX enter 100% as UNIX will see the SST UNIX partition as a complete physical drive and will not affect any other SST partitions on the disk.

c) It is not necessary to add in any bad blocks as SCSI devices are logally defect free.

6) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section found in this document.

MANUAL INSTALLATION

> **PLEASE READ ALL COMMENTS AND STEPS BEFORE AND DURING THE INSTALLATION!(comments are denoted by /* */)**

1) Make sure that the system has all of the necessary software installed to build a new kernel.

2) Bring up the system and login as "*root*".

3) Insert the high density SST Installation floppy diskette into the floppy drive and type in the following commands :

    # cpio -ivcumdB < /dev/install
    # cd /tmp
    # ./installsst

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer NO to the auto-install question.

NOTE: Before you begin the manual installation we strongly recommend that you make backup copies of the */etc/conf/sdevice.d* and */etc/conf/cf.d* directories. That way should you want to return your system to its original state at a later time you need only erase the contents of both directories and copy in the original files from the backup directories you created.

```
#   cd /etc/conf (enter)
#   mkdir cf.original (enter)
#   cp cf.d/* cf.original (enter)
#   mkdir sdevice.original (enter)
#   cp sdevice.d/* sdevice.original (enter)
```

Should you wish to restore your directories later, type:

```
#   cd /etc/conf (enter)
#   rm cf.d/* (enter)
#   cp cf.original/* cf.d (enter)
#   rm sdevice.d/* (enter)
#   cp sdevice.original/* sdevice.d (enter)
```

4) For every SST driver that you want installed into your system, you must go into the /etc/conf/sdevice.d directory and create a file with that driver's name.

Note: The scsiprim and sdlpfm drivers are mandatory if you want to use any of the new drivers. All of the other drivers can be optionally installed.

Example using the sdlpfm file :

```
#   cd /etc/conf/sdevice.d (enter)
#   vi sdlpfm (enter)
```

enter the line:

```
sdlpfm    Y    1    0    0    0    0    0    0    0
```

Create a file named scsiprim and enter the line:

```
scsiprim   Y   56   5    1   15   350   353   0    0
```

Create a file for each of the folowing drivers that you wish to use with the shown contents:

```
sst      Y   56   0    0    0    0    0    0    0
seq      Y   56   0    0    0    0    0    0    0
worm     Y   56   0    0    0    0    0    0    0
```

```
/* step 5 : If you ARE going to be using the hd BOOT driver, you */
/* must go into the /etc/conf/sdevice.d directory and change the   */
/* hd file entry, go into the /etc/conf/mdevice file and change    */
/* the hd entry, and go into the /etc/conf/pack.d/hd directory     */
/* and move the file Driver.o to hd.driver.o. Then copy            */
/* /usr/sst/hd.Driver.o to /etc/conf/pack.d/hd/Driver.o. If you are */
/* NOT using the hd BOOT driver, skip 5 ) and go to 6).            */
```

5) If you ARE using the BOOT driver:

```
#   cd /etc/conf/sdevice.d (enter)
#   vi hd (enter)
```

Before : hd   Y   2   2   2   14   320   32f   0   0
After :   hd   Y   1   0   0   0   0   0   0   0

```
#   cd /etc/conf/cf.d (enter)
#   vi mdevice (enter)
    /hd (enter)
```

Before : hd   Iocrwi   iHobrc   hd   0   0   1   2   -1

After :   hd   Iocrwi   iobrc   hd   0   0   1   1   -1

```
#   cd /etc/conf/pack.d/hd (enter)
#   cp /usr/sst/hd.Driver.o Driver.o (enter)
```

```
/*NOTE : Now you must add the new drivers that you will */
/* be using to the mdevice file.                        */
/* Note : The scsiprim and sdlpfm drivers are mandatory */
/* if you wish to use any of the SST drivers, all        */
/* other drivers are optional.                           */
```

6) # cd /etc/conf/cf.d (enter)
   # vi mdevice (enter)

Scroll to the bottom of the file and add the following lines :

scsiprim	-	icoH	prim	0	21	1	56	6
sdlpfm	oi	ico	sdlp	0	22	1	56	-1
sst	ocrwiI	icbo	sst	23	23	1	56	-1
seq	ocrwiI	ico	seq	0	24	1	56	-1
worm	ocrwiI	ico	worm	0	25	1	56	-1

```
/* Note : The major unit numbers given to the drivers        */
/* are arbitrary, and can be any unused major                */
/* unit numbers. i.e. the first major unit number            */
/*  we  used  in our system was 21 for character and         */
/*  23  for  block.  All nodes made for a given              */
/* driver  must  be  made  with the major unit number        */
/* that you assign it in the mdevice file.                   */
/* "cd" to the /etc/conf/pack.d directory and create a directory  */
/* for each SST driver you will be using, then copy the driver    */
/* object file from /usr/sst to the new pack subdirectory.        */
```

```
#  cd /etc/conf/pack.d (enter)
#  mkdir sdlpfm (enter)
#  cp /usr/sst/sdlpfm.Driver.o     sdlpfm/Driver.o (enter)
#  mkdir scsiprim (enter)
#  cp /usr/sst/scsiprim.Driver.o   scsiprim/Driver.o (enter)
```

/* Repeat for *sst, seq* and *worm* if you have selected these drivers */

```
7)  # /etc/conf/bin/idbuild (enter)
    # mcs -d unix (enter)
```

**NOTE : At this point, if you are going to copy this new kernel over
to the boot floppy, you will have to strip the kernel. The reason for this
is that there is not enough room for the new kernel on the floppy.
Stripping the kernel will keep some of the UNIX utilities from working,
so once installed, the original unstripped kernel should be copied onto
the disk. Therefore you should make a copy of the original kernel
before you strip it.**

```
#  cp unix unix.scsi(ener)
#  strip unix (enter)
```

```
/* If  you  ARE  using the hd BOOT driver,  you should            */
/* make a  copy  of the bootable UNIX installation floppy disk    */
/* (possibly using the sysadm facility) and  copy  the  new kernel  */
/*  onto  it. The following example commands should help you with  */
/* the copy.                                                      */
```

```
#  mount   /dev/dsk/f0q15d  /mnt  (return)
#  cp /etc/conf/cf.d/unix   /mnt/unix (return)
```

```
/* At this point you will need to make a slight modification of    */
/* the INSTALL2 script file. The modification turns off           */
/* the automatic generation of a new kernel at the end of the  script.*/
/* Some releases of AT&T do not require this change.               */
/* Once the new system is installed, rerun the CPIO and installsst  */
/* to install the SST drivers in the newly installed kernel. DO NOT */
/* strip THIS KERNEL.                                               */
```

      # *chmod +w /mnt/INSTALL2 (return)*
      # *vi /mnt/INSTALL2 (return)*
         This will put you in the vi editor. Enter the following commands:
      /idbuild (return) If the string is not found, "!quit" and go to 8)
      5 dd (return)
      ZZ (return)
         ZZ (return) will save the file and return you to the Unix prompt
      # *umount /mnt (return)*

```
/* Note : If you ARE using the hd BOOT driver, you should         */
/* delete the newly created kernel, or copy it  to  another  name  or */
/* directory or else the next time you try to boot the drive you are  */
/* working on, the  new  kernel  will boot and the system will hang  */
/* or panic.                                                          */
```

      # *mv unix unix.stripped*

8) Power down the system.

      # *shutdown -g0 -y*

Install the SST card along with a SCSI drive(s) into your system. See Chapters 1 and 3 for details.

Note : In order to use the hd Boot driver, the boot drive must be set to target ID 0. The remaining drives can be set to any other unique target ID.

---

9) If you ARE going to use the hd BOOT driver, at power on you must run your system CMOS setup utility and tell the system that there are no hard drives attached. Boot the system with the new bootable UNIX floppy, and follow the normal UNIX hard disk installation procedure.

NOTE : Following are a few things you should make note of during the normal UNIX installation.

a) There is no need to reformat, as SCSI devices will not require a new format.

b) During the FDISK section of the install, it is necessary to create an FDISK UNIX partition. Currently with version 2.0 of the SST drivers there is no support for DOS under UNIX functions to a DOS (SST or FDISK) partition in SST mode. These DOS under UNIX functions can only be used in OEM mode. SST and OEM modes are described in detail earlier in this chapter. If you are using SST mode, when FDISK asks for percentage of disk to use for UNIX enter 100% as UNIX will see the SST UNIX partition as a complete physical drive and will not affect any other SST partitions on the disk.

c) It is not necessary to add in any bad blocks as SCSI devices are logally defect free.

6) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section found at the beginning of this chapter.

IN ORDER TO INSTALL THE SST SYSTEM ON YOUR SCSI HARD DRIVE AS THE BOOT DEVICE, YOU MUST HAVE AN UP AND RUNNING SCO XENIX SYSTEM WITH THE COMPLETE OPERATING SYSTEM AND COMPLETE DEVELOPMENT SYSTEM PACKAGES INSTALLED. TO INSTALL THE SST DRIVERS FOR ADDITIONAL HARD DRIVES , OR OTHER NON-BOOT SCSI DEVICES, YOU NEED ONLY HAVE THE COMPLETE LINK KIT.   See APPENDIX D for details.

IF YOU ARE UPGRADING YOUR SST SYSTEM, YOU MUST FIRST COMPLETELY DE-INSTALL THE EXISTING SST SYSTEM. IF YOU DO NOT DE-INSTALL, THE NEW SSTCONFIG SCRIPT WILL NOT FUNCTION PROPERLY. IF YOU ORIGINALLY INSTALLED THE SST SYSTEM WITH SSTCONFIG, YOU MAY DE-INSTALL IT USING SSTCONFIG, OR YOU MUST DO THE DE-INSTALL MANUALLY, WHICH WILL RETURN YOUR SYSTEM DEVELOPMENT AND OPERATING SYSTEM FILES TO THEIR ORIGINAL STATE.

Auto Installation (For v2.3.2 and later only)

The auto-installation for SCO XENIX is a simple procedure that will automatically install all of the necessary files, build a new kernel, and copy it to a bootable N1 floppy disk for you. The installation has two steps. In the first step, all of the SST files are copied into the /usr/sst directory. In the second step the new system is configured and built, and the bootable N1 floppy disk is set up for you if you desire. The second step is accomplished by running an executable script file called *sstconfig.*

The *sstconfig* file is an executable shell script file that will allow you to configure a new SCO XENIX kernel with only those SST drivers that you want added into your system. This script file will automatically build a new kernel for you, format a floppy if you like, make a copy of the original N1 floppy, and copy the new kernel onto the new floppy. *sstconfig* will be placed in the directory /usr/sst along with other files that are necessary for the system configuration. The *sstconfig* script can be run any time you want to add or remove one or more of the SST drivers. If you are not going to copy the new kernel to a bootable floppy, answer NO to

that question. The new kernel will be renamed *unix.scsi* and left in the */usr/sst* directory.

The procedure for installing the SST system into your SCO XENIX system with the auto-install is as follows :

1) Place the SST UNIX/XENIX high-density diskette into the drive.

2) Type in the following commands :

    # cpio -ivcumdB < /dev/fd096ds15 (enter)
    # cd /tmp (enter)
    # ./installsst (enter)

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer YES to the auto-install question, and the *sstconfig* script will be executed for you.

3) The sstconfig script will prompt you for all necessary information and do every thing else for you.

4) Power down the system.

    # shutdown -g0 -y

Install the SST card along with the SCSI device(s) into your system, if you have not already done so. See Chapters 1 and 3 for details.

> **Note : In order to use the hd BOOT Driver, the boot drive must be set to target ID 0. The remaining devices can be set to any other unique target ID.**

5) If you ARE going to use the hd BOOT Driver, at power on you must run your system CMOS setup utility and tell the system that there are no hard drives attached. Boot the system with the new N1 floppy, and follow the normal SCO XENIX hard disk installation procedure.

NOTE : Following are a few things you should make note of during the normal SCO XENIX installation.

    a) If you are using a 2.3.2 or later version, you will be asked for the controller type. Select the SCSI type. This will bypass the bad

block section of the install, as SCSI devices are logically defect free.

b) Select the "default disk parameters" option, even if they don't match the drive manufacturer specifications.

c) When using OEM mode, you can partition the disk for XENIX and DOS during the FDISK section of the normal XENIX installation. if you have created an SST XENIX bootable partition, you should select the "Use entire disk for Xenix" option because SCO XENIX sees an SST XENIX partition as a distinct physical disk, and any DOS partition created within that SST XENIX partition will not be available if you boot from a DOS SST partition or visa versa.

d) If you are using a 2.3.1 or earlier version, you will be asked to enter in bad blocks, just quit out of this section because SCSI devices are logically defect free. You will also be asked how many tracks to use for bad blocks, enter 0.

6) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section at the end of this document.

MANUAL INSTALLATION for v2.2.3 and later

> **PLEASE READ ALL COMMENTS AND STEPS BEFORE AND DURING THE INSTALLATION!(comments are denoted by /* */)**

1) Make sure that you have the complete Operating System package with link kit installed and, if the HD BOOT is going to be used, the complete Development System package installed.

2) Login as "*root*".

3) Insert the high density SST Installation floppy diskette into the floppy drive.

    # cpio -ivcumdB < /dev/fd096ds15 (enter)

If you are using a 2.2 version the CPIO will copy over the proper files to the */usr/sst* directory.

If you are using a 2.3 version do the following steps:

The *installsst* script will ask you which operating system you will be using and copy over the proper files to the */usr/sst* directory. Answer NO to the auto-install question.

```
/*NOTE : Add the drivers you want to add to your new            */
/* system configuration using the XENIX configure utility.      */
/* NOTE: The major unit numbers used are arbitrary. Start with */
/* the first unused major unit number, and do not have to be    */
/* contiguous. e.g. the first unused major unit number for      */
/* our 2.2.3 system was 34 and the first unused major unit      */
/* number for our 2.3.0 system was 56. In this document we      */
/* chose to use 34.                                             */
/* NOTE: The scsiprim and sdlpfm drivers are mandatory if you  */
/* want to use any of the new drivers. All of the other drivers */
/* can be optionally installed. If you do not desire a          */
/* a specific driver in your new kernel, do not configure       */
/* that driver into the system.                                 */
```

4) # cd /usr/sys/conf (enter)
   # ./configure -a primintr -c -m 34 -l 5 -v 31 (enter)
   # ./configure -a sdlpopen sdlpioctl -c -l 5 -m 35 (enter)
   # ./configure -a sstopen sstclose sstread sstwrite sstioctl sststrategy
      sstinit -b -c -l 5 -m 36 (enter)
   # ./configure -a seqopen seqclose seqread seqwrite seqioctl
      seqinit -c -l 5 -m 37 (enter)
   # ./configure -a wormopen wormclose wormread wormwrite wormioctl
      worminit -c -l 5 -m 38 (enter)

```
/* If you are NOT going to use the hd BOOT driver, go to 6)     */
/* NOTE : If you ARE going to be using the hd BOOT driver, add*/
/* the hd BOOT driver to the system by editing the master file. */
```

Note : Depending on your system, the *hd* line could be either of the following :
hd 1   0227   014   hd   0   1   1   1   5   36   0   0   0   0
hd 1   0227   014   wd   0   0   1   1   1   5   36 0   0   0

We chose the first line for this document.

5) If you ARE using the BOOT driver, edit the "*master*" file as follows:

```
Before: hd  1    0227  014   hd  0  1  1  1  5  36  0  0  0
After:  hd  0    0137  014   hd  0  1  1  1  1   0  0  0  0
```

/* NOTE: We have shown all of the drivers to be added. If you are*/
/* NOT going to be using a specific driver, do not add it   */
/* into the *link_xenix* file.   */

6) Edit the *link_xenix* file to include these lines:

 If you ARE going to be using the *hd* BOOT driver, add these lines :

   ../io/hd.o ../io/sst.o ../io/sdlpfm.o ../io/scsiprim.o \
   ../io/seq.o ../io/worm.o \

If you ARE NOT going to be using the *hd* BOOT driver, add this line:

   ../io/sst.o ../io/sdlpfm.o ../io/scsiprim.o ../io/seq.o ../io/worm.o \

These lines should be included between *kid.o* and *libml.a*

/* Copy the driver object modules to the */usr/sys/io* directory */

   # *cp /usr/sst/*.o /usr/sys/io (enter)*

7) If you have the Complete Development system type:

make (enter)
 or else use
./link_xenix (enter)

/* If you are NOT going to use the *hd* BOOT driver, you can */
/* copy the new kernel over to the root directory and go to 9)   */

8) Insert the "Xenix 386 N1" Bootable high density floppy diskette into
the floppy drive, and have a blank unformatted high density diskette
on hand.

   # *diskcp -f -96ds15*

Leave the new floppy in the drive and execute the commands :

   # *mount /dev/fd096ds15 /mnt.*
   # *cp /usr/sys/conf/xenix /mnt/xenix.*
   # *umount /dev/fd096ds15*

7-51

9) Power down the system.

 # haltsys

Install the 7000-FASST card along with a SCSI drive(s) into your system. See Chapters 1 and 3 for details.

Note : In order to use the hd BOOT driver, the boot drive must be set to target ID 0. The remaining drives can be set to any other unique target ID.

---

10) If you ARE going to use the *hd* BOOT driver, at power on you must run your system CMOS setup utility and tell the system that there are no hard drives attached. Boot the system with the new N1 floppy, and follow the normal SCO XENIX hard disk installation procedure.

NOTE : There are a few things you should make note of during the normal SCO XENIX installation.

a) If you are using a 2.3.2 or greater version, you will be asked for the controller type. Select the SCSI type. This will bypass the bad block section of the install, as SCSI devices are logically defect free.

b) Select the "default disk parameters" option, even if they don't match the drive manufacturer specifications.

c) Support for DOS under XENIX is the standard support if you are only using OEM mode. For SST mode, DOS under XENIX is now supported as well. For more information on using DOS under XENIX with SST DOS partitions, and MODES of operation, consult the DRIVER INFORMATION section and the *setdos* UTILITY information found in this document. When using OEM Mode, you can partition the disk for XENIX and DOS during the FDISK section of the normal XENIX installation. If you have created an SST XENIX bootable partition, you should select the "Use entire disk for Xenix" option because SCO *Xenix* sees an SST XENIX partition as a whole physical disk.

d) If you are using a 2.3.1 orearlier version, you will be asked to enter in bad blocks, just quit out of this section because SCSI devices are logically defect free. You will also be asked how many tracks to use for bad blocks, enter 0.

11) For information on making nodes and using the SST drivers, refer to the DRIVER INFORMATION section at the beginning of this chapter.

APPENDIX A:
TECHNICAL SUPPORT
INFORMATION

WHAT TO DO IF YOU ARE HAVING TROUBLE

If you are having trouble with your SST system:

● Read this manual. The answer to most technical questions about the FASST system can be found here.

● Simplify your system. Remove any additional cards from your machine and try to identify if any one other card is the source of the conflict.

● Talk to the dealer who supplied you your system. He may be familiar with possible sources of conflict.

● If your problem appears to be with the FASST hardware, call Western Digital Technical Support.

● If your problem appears to be with the SST software, or you are unsure of the nature of your problem, call Columbia Data Products, Inc. Technical Support.

Following are a few items which will make it easier for the Technical Support staff to assist you:

● If at all possible be at your computer, ready to try the suggestions of the Technical Support Staff.

● Know the manufacturer, model and revision of your computer; whose BIOS is on the machine and what version; manufacturer and type of any peripherals in the machine.

● Have the technical reference guide, system information manual, or other documentation associated with the items in your computer immediately accessible.

● Know what operating system and version you are running or trying to run.

● Know the utilities you are running or trying to run.

When calling, please have your FASST products available, including the serial and version numbers from your SST software diskettes.

VOICE SUPPORT

The Columbia Data Products, Inc. voice support number is (407) 869-6700.
The Columbia Data Products, Inc. fax number is (407) 862-4725.
CDP Voice support is available between the hours of 10:00 A.M. and 6:00 P.M. ET, Monday through Friday.

ON-LINE BULLETIN BOARD SYSTEM SUPPORT

The Columbia Data Products, Inc. BBS number is (407) 862-4724.
The Western Digital Corp. BBS System number is (714) 756-8176.

BBS settings are 1200 or 2400 baud, 8 data bits, 1 stop bit, no parity.

RETURNED MERCHANDISE AUTHORIZATION

If you must return a FASST product call Western Digital Technical Support
to discuss the problem. If service is required, you will be given a Return
Authorization Number. Western Digital will not accept a returned package
unless it has a return authorization number.

(714) 932-4952

Western Digital hardware technical support number is (800)832-4778

**WD hardware technical support is available between the hours of 10:00
A.M. and 8:00 P.M. ET, Monday through Friday.**

3 1/2" Media

If you need the SST software on 3 1/2" media, return your 5 1/4" media
diskettes along with your name, company name, address, and phone number
and send it to us at the address on page *iv*. Your 3 1/2" media diskettes will
be sent to you by U.S. mail. Distributors/Resellers should contact Columbia
Data Products, Inc. for details on quantity non-end user media changes.

APPENDIX B: DOS & PC-MOS INSTALLATION SUMMARY

If you are installing the SST as the ONLY hard drive controller, proceed as follows:

- Boot your computer with DOS, run your AT's setup program, and specify that NO hard drives are installed.

- Reboot your computer with DOS from drive A:.

- Insert the SST Installation Diskette in drive A:.

- Run the program SSTSETUP.EXE by typing: SSTSETUP and pressing Enter.

- Should you need any help, there is on-line help built into SSTSETUP. Just select the help command and position the shaded bar over the area of difficulty and press RETURN or hit the "hot" key (F1) for help.

If you are installing the SST as an ADDITIONAL hard drive controller, boot your computer as you normally would and then type the following:

COPY A:SST*.* C:\(enter)
COPY A:TEST*.* C:\ (enter)
COPY A:READ*.* C:\(enter)

This will copy all of the SST files needed to run the SST system. Once you have done this, you MUST add the following lines to your CONFIG.SYS file by using EDLIN or some other text editor:

MS or PC-DOS	PC-MOS
DEVICE = SSTBIO.SYS* *DEVICE = SSTDRIVE.SYS* *BUFFERS = 3***	*DEVICE = SSTBIO.SYS /WE* *FREEMEM = NONE* *MEMDEV = $386.SYS* *DEVICE = SSTDRIVE.SYS* *BUFFERS = 20*

Now run the program SSTSETUP.EXE by typing SSTSETUP and pressing Enter. Should you need any help, there is on-line help built into SSTSETUP.

What's on the Diskettes for DOS...

The SST Installation and Utility diskettes contain all the software needed to install and operate the SST SCSI subsystem. A list of the files and a brief description of each follows:

● SSTBIO.SYS This program contains all the software necessary to allow the computer to communicate with the SST controller card.

● SSTDRIVE.SYS This program is responsible for examining the SST hard disk drive(s) and setting up the various drive letters as well as the designated amount of megabytes.

● SSTSETUP.EXE This program tells the SST system how you want your hard drive(s) organized; such as, how many drive letters you want, how big each lettered drive should be, etc.

● TESTDISK.EXE This program is included to give you an idea of just how fast the SST is compared to other hard drive systems. It is a disk performance tester which measures throughput.

● TESTDISK.DOC This file defines what throughput is and explains the TESTDISK.EXE test results so you can understand what they mean.

● CONFIG.SYS This is a sample CONFIG.SYS file which contains the lines necessary to allow the SST to operate with your DOS.

● README.DOC This file contains information which didn't get a chance to get published in this manual. You should read it to find out what may have changed with the SST hard drive system since this manual was published.

● LOCK.EXE This file is provided for use with the removable cartridge hard drives. It locks the media in place and increases performance.

● UNLOCK.EXE This file is provided for use with removable cartridge hard drives. It unlocks the door so the media may be removed..

● BUFFERS.COM This program will adjust your CONFIG.SYS to the recommended BUFFERS= setting.

● AUDIO.COM This is a memory resident program designed to allow you to listen to music on the supported CD-ROM drives.

● DISK01.SYS This is the file necessary for the operation of OS/2 and should not be used under DOS.

● SCSI.EXE This is a diagnostic program designed for the advanced user only. If you are unsure , DO NOT EXPERIMENT!

● SSTCDROM.SYS This is a MSCDEX driver for use with any CD-ROM drive.

● WDDTI.EXE replaces the file WDDTI.EXE on your SYTOS distribution disk and allows its use with v3.36.

● SCAN.EXE This file "scans" the SCSI bus and identifies the devices attached, their type, their Target ID, and LUN.

- SST.EXE This file is a simple menu program for using the SST Utilities supplied with v3.36.

- WD7000.SYS This is a driver for multiple 7000-FASST2 board operations.

- TAPEUTIL.EXE This is a utility for use with SCSI tape drives.

- AUTOEXEC.BAT If you don't have an AUTOEXEC.BAT file, you can copy this one.

- SST_DRVR.DSK and SST_DRVR.OBJ are NOVELL device drivers and should not be used under DOS.

- SSTFMAT.EXE is a SCSI Formatter and Media Diagnostics Utility.

MORE INFORMATION ON ALL THESE PROGRAMS CAN BE FOUND IN APPENDIX H.

(NOTES)

APPENDIX C:
Using WINDOWS v3.0

The SST subsystem will fully support Microsoft WINDOWS v3.0 on ROM alone; i.e, with NO device drivers loaded. For full featured support of removable Magneto Optical or Sequential Access devices and for added performance, you may choose to use the RAM-resident (SSTBIO.SYS) driver.

NOTE: With WINDOWS 3.0, it is not recommended to "high-load" any drivers. Doing so will prevent WINDOWS from operating in 386 mode. As of this printing, none of the EMS/XMS high-load utilities support Microsoft's DOS Protected Mode Interface (DPMI) standard that would allow high-load environments and WINDOWS 3.0 to operate together. It is expected that the next release of 386-to-the-MAX and QEMM will offer this functionality. If interested, you should contact Qualitos or Quarterdeck for more information.

On a WDATXT-FASST Controller:

If you are using an WDATXT-FASST in DMA I/O mode, you must edit your Microsoft Windows version 3.0 SYSTEM.INI file to include the line

   DMABUFFERSIZE = 064

You must insert this line immediately before the line in the SYSTEM.INI file that reads

   [standard]

Using the SST Applications under WINDOWS:

Included on the SST Utilities Diskettes are icons and PIF files for all of the SST utilities and application programs. In order to make use of these files, you must:

   1) Make a directory called "*C:\SSTUTILS*" on your hard drive.

C-1

2) Copy all of the SST utilities and applications into the SSTUTILS directory created in Step 1.

3) Copy all of the .PIF and .ICO files from the \UTILS\WIN30 directory of the SST Utilities Diskette to the SSTUTILS directory created in Step 1.

4) Copy the SST.GRP file from the \UTILS\WIN30 directory of the SST Utilities Diskette to your MS-WINDOWS 3.0 directory.

5) Load MS-Windows, and select the PROGRAM MANAGER window.

6) Under the Program Manager FILE menu, select NEW.

7) In The "New Program Object" Dialog Box, select "Program Group", and press "OK".

8) In the "Program Group Properties" Dialog Box, enter "SST.GRP" for the "Group File" field, and then press "OK".

9) It may be necessary to edit some of the .PIF files to "full window" for normal operation.

Your SST applications can now be loaded and used from the MS-WIN-DOWS Program Manager.

APPENDIX D - Instruction Summary for Installing SST UNIX/XENIX Boot Devices

If you are using the SST subsystem for non-boot devices only, skip this section. The installsst script will handle the complete installation.

1) You MUST have a host system currently running the same version of UNIX/XENIX you intend to install on the SST system. At this time the Operating System vendors do not have built-in support for 7000-FASST2 cards; therefore, a new kernel must be built. The host may be another physical machine that is already "up and running" or you must temporarily install the Operating System on an ST-506 or other standard hard drive in the new system.

2) Be sure that all necessary packages are installed to build, compile, and link a new kernel. For SCO XENIX this includes the COMPLETE development system. It is not possible to use the SST subsytem as the boot device under XENIX without the development system.

3) Run the installsst script per the instructions in this chapter. We recommend that you select only the boot driver to avoid creating a kernel that is too large for the new BOOT/N1 diskette.

4) Using the newly created BOOT/N1 diskette in place of the manufacturer's original diskette, install the Operating System on the SST subsystem per the manufacturer's instructions.

5) When the normal installation is complete, you should run the complete SST installation on the newly loaded system, including the CPIO. This will reconfigure your newly installed system with the SST drivers so future kernels will retain the SCSI code. If you do not run the complete SST installation on the new system, any new kernel created will NOT run or boot the system.

6) If you used a separate host system to create the new BOOT/N1 diskette, once the SST subsystem is up and running, you should run sstconfig in path /usr/sst to de-install all SST drivers. If you do not, any new kernel created on the host system will be configured for the SST card and will not boot the host system.

APPENDIX E: MINIMUM REQUIREMENTS AND SUPPORT LIST

MINIMUM REQUIREMENTS

- 7000-FASST2 : AT OR COMPATIBLE (80286, 80386, 80486 ISA, PS/2 Models 35, and 40)
- WDATXT-FASST : XT, AT OR COMPATIBLE (8086, 8088, 80286, 80386, 80486 ISA, PS/2 Models 35, 40)
- 512K RAM

OPERATING SYSTEMS SUPPORTED

- MS-DOS 3.2 - 4.01
- COMPAQ DOS 3.31
- PC-DOS 4.0x
- PC-MOS/386 version 2.1
- OS/2 v1.1 and v1.2
- WINDOWS OPERATING ENVIRONMENT
- WESTERN DIGITAL SCSI SY-TOS TAPE BACKUP
- NOVELL SFT OR ADVANCED 2.1 OR GREATER
- NETWARE 386 v3.0
- INTERACTIVE UNIX/386 version 2.x
- AT&T UNIX/386 version 3.2
- INTEL UNIX/386 version 3.2
- SANTA CRUZ OPERATIONS XENIX SYSTEM V/386 version 2.2.1 - 2.3.2
- SANTA CRUZ OPERATIONS UNIX SYSTEM V/386 version 3.2
- MICROSOFT CD-ROM EXTENSIONS version 2.0 and greater

THE SST SOFTWARE FEATURES

- Full MS-DOS 3.20 and greater compatibility

- OS/2 v1.1 and v1.2 Bootable Fixed Disk Support, including HPFS and Dual-BOOT

- Full Windows 386 compatibility

- Full Novell SFT and ADVANCED 2.1 and greater compatibility, including Non-Dedicated Mode (7000-FASST2 only)

- Full Novell Netware 386 3.0 compatability (7000-FASST2 only)

- DOS 32-megabyte barrier broken for pre-3.31 DOS's on non-boot partitions.

- Supports single DOS volumes up to 512 megabytes each

- Supports up to 24 logical volumes resulting in a total system capacity in excess of 12 gigabytes at a time under DOS

- BIOS ROM included to allow "booting" from the SST

- Full menu-driven diagnostics

- SCSI Physical Formatter

- SCSI Command Shell

- Easy to use menu-driven software with on-line help

- Allows "spanning" of logical partitions over multiple physical SCSI drives under DOS

- Write protection of logical partitions

- Password protection of partition editor to prevent accidental destruction of important data

- All partitions are 100% defect-free to DOS

- Works with your existing ST-506 or ESDI hard disk system

- Up to 30 MULTIPLE bootable partitions on one drive

- Removable Cartridge magnetic and magneto-optical (MO) hard drive support

- CD-ROM support

- Write Once Read Many (WORM) drive support

- Sequential device (tape) support

Appendix F:
Loading SST Drivers into High Memory

The SST drivers now support the new Microsoft/IBM VDS (Virtual DMA Services) standard allowing the loading of all or most of the SST drivers into high DOS memory in environments that likewise support the VDS standard. Example programs which provide such an environment are 386-to-the-MAX v4.08 Professional, QEMM v5.0.

Under these environments, and with a 7000-FASST2 card in a 386 or 486 system, all SST drivers may be loaded into high DOS memory by the normal procedure prescribed by the EMS driver.

With an ATXT-FASST card and a 386 system, all SST drivers (with the exception of SSTBIO.SYS) may be loaded into high DOS memory. SSTBIO.SYS **must** be loaded in your CONFIG.SYS **before** your EMS driver.

With non-VDS compliant EMS environments, or in 286 machines, all SST drivers except SSTBIO.SYS should be capable of high-loading, but in these cases the "/W:" switch must be used in systems with a 7000-FASST2 card.

NOTE: With WINDOWS 3.0, it is not recommended to "high-load" any drivers. Doing so will prevent WINDOWS from operating in 386 Mode. As of this printing, none of the EMS/XMS utilities support Microsoft's DOS Protected Mode Interface (DPMI) standard that would allow the loading of device drivers outside of the conventional base 640K RAM area for 386 Mode operation. It is expected that the next release of 386-to-the-MAX and QEMM will offer that functionality. If interested you should contact Qualitas or Quarterdeck for more information.

(NOTES)

Appendix G:
Contents of the Diskettes

SST Installation Diskette - Disk 1/4 (DSDD-DOS)

    AUDIO.COM
    AUTOEXEC.BAT
    BUFFERS.COM
    CONFIG.SYS
    LOCK.EXE
    README.DOC
    SCAN.EXE
    SSTBIO.SYS
    SSTCDROM.SYS
    SSTDRIVE.SYS
    SSTSETUP.EXE
    SSTUTIL.EXE
    TESTDISK.EXE
    UNLOCK.EXE
    WD7000.SYS
    WDDTI.EXE
    \OS2\README.DOC
    \NOVELL\NW286\SST_DRVR.DSK
    \NOVELL\NW286\SST_DRVR.OBJ
    \NOVELL\NW386\SDLPDRV1.DSK
    \NOVELL\NW386\SDLPDRVR.DSK

SST Utilities 1 Diskette - Disk 2/4 (DSDD-DOS)

    SST.EXE
    SST.MNU
    SSTFMAT.EXE
    SSTFMAT.HLP
    SSTFMAT.MNU
    \OS2\1.1\ATXT\DISK01.SYS
    \OS2\1.1\7000\DISK01.SYS
    \OS2\1.2\ATXT\DISK01.SYS
    \OS2\1.2\7000\DISK01.SYS

SST Utilities 2 - Disk 3/4 (DSDD-DOS)

BUSONOFF.EXE
BUSONOFF.MNU
SCSI.EXE
TAPEUTIL.EXE
TAPEUTIL.HLP
TAPEUTIL.MNU
\WIN30\ (files for the SST Utilities under WINDOWS 3.0)

SST UNIX/XENIX Diskette - Disk 4/4 (DSHD-CPIO)

in.att.sst.z
in.sco.sst.z
in.scu.sst.z
in.isc.sst.z
readme.SST
installsst

> NOTE: The UNIX/XENIX Diskette is NOT readable from DOS and will always return an "Abort Retry or Fail" message if any attempt to access the diskette is made except through UNIX/XENIX CPIO.

APPENDIX H:
SOFTWARE REFERENCE

Contents

Provides audio CD play capability.

SYNTAX

AUDIO

DESCRIPTION

AUDIO is an MS-DOS terminate-and-stay-resident (or "Pop-Up") pro-
gram which can be invoked by simultaneously pressing CTRL-ALT-A any
time after it has been loaded.

AUDIO provides control over the audio play capability of TOSHIBA,
SONY, and DENON CD-ROM drives.

BUFFERS.COM   DOS

Adjusts the CONFIG.SYS file to a recommended BUFFERS =
statement.

SYNTAX

BUFFERS

DESCRIPTION

BUFFERS.COM will adjust the MS-DOS CONFIG.SYS files "BUFFERS
=" statement to a number which provides the best performance improve-
ment for the amount of system memory used.

The "BUFFERS =" statement controls the number of sector buffers MS-
DOS will use for I/O operations.

Normally, DOS uses a 512-bytes sector size and a BUFFERS = statement
set to 20, which uses 10K of memory (20 Sector Buffers * 512 bytes per
sector). However, when using the SST system to break the 32-megabyte
partition size barrier with a version of DOS less than 3.31 +, some partitions
may have a sector size of 1K, 2K, 4K, or even 8K. With these partitions, a
BUFFERS = 20 statement would use up to 160K of system memory (20
Sector Buffers * 8K per sector).

BUFFERS.COM will alter your CONFIG.SYS BUFFERS = statement so
that it uses approximately 24K of system memory.

BUSONOFF.EXE   DOS
Controls SCSI bus on/off timing.

SYNTAX

BUSONOFF [/M] [/HI] [/DEBUG]

DESCRIPTION

BUSONOFF is an MS-DOS utility to control the bus on/off timing for the
WD 7000-FASST by adjusting values in the SST HAC driver file.

Parameters are as follows:

[/M]

Forces the program into black and white only mode, even if no
monochrome controller is found. Used for systems on which colors are
not properly displayed. Forced black and white mode can also be
obtained by setting the MONO environment variable to TRUE.

EXAMPLE:
SET MONO = TRUE

[/HI]

Allows the program to run in EGA/VGA high resolution 43/50 line
mode. Forced high resolution operation can also be obtained by setting
the HIREZ environment variable to TRUE.

cdrom   UNIX
Accesses files stored on an ISO/9660 or High-Sierra formatted
CD-ROM disk.

SYNTAX

cdrom

DESCRIPTION

cdrom is a UNIX/XENIX utility found in the */usr/sst* directory which can access files stored on an IS0/9660 or High-Sierra formatted CD-ROM data disk. The program provides functions to allow a user to view the data stored on the disk or to copy the files onto a UNIX/XENIX file system.

---

dutil   UNIX

Provides low level direct access to SDLP/SST devices.

SYNTAX

dutil

DESCRIPTION

dutil is a UNIX/XENIX utility found in the */usr/sst* directory which allows direct control of the devices connected to the SST/SDLP system.

The program can control hard drives, WORM drives, CD-ROM drives, and sequential access devices (tape).

> dutil is a potentially dangerous program and should only be used by users who have a high degree of experience with the UNIX/XENIX operating system and SCSI Devices.

The following is a list of device utility commands:

EXAMINE (hard drives)

Shows what SST partitions are on the selected hard drive.

PARTITION EDITOR (hard drives)

Allows creation, deletion, activation and deactivation of SST partitions. Only UNIX/ XENIX partitions can be created.

CHANGE PARAMETERS (all devices)

Allows for manipulation of the device's density and block size.

READ (hard drives, CD-ROM drives, WORM drives)

Provides access to any logical block located on the hard drive. The selected block will be read into the *dutil* data buffer.

READ (tape drives)

Provides access to the next logical block located on the tape drive. The block will be read into the *dutil* data buffer.

WRITE (hard drives, WORM drives)

Provides the ability to change any logical block located on the hard drive. The *dutil* data buffer will be written to the selected block.

WRITE (tape drives)

Provides the ability to write the *dutil* buffer to the beginning or logical end of a tape.

BUFFER EDITOR (all)

Allows for viewing and editing of the *dutil* data buffer.

FORMAT (hard drives)

Will low-level format a drive. A new interleave value can be specified.

ZERO (hard drives)

Will erase all the data on the device by writing zeros to all the data blocks.

REWIND (tape drives)

Will rewind the media contained in the selected sequential access device.

WRITE FILE MARK (tape drives)

Will write a filemark at the current media position or read the tape until a filemark or end of media (EOM) is encountered.

RETENSION (tape drives)

Will re-tension the media in the selected drive by winding the media from begining to end and rewinding it again.

ERASE (tape drives)

Will erase all the information contained on the selected drive's media.

LOCK.EXE   DOS

Locks removable media in place.

SYNTAX

LOCK

DESCRIPTION

The lock command is a DOS utility which improves performance on removable media drives. After running LOCK.EXE, the media installed in a device becomes locked in place and the eject button is inactive until UN-LOCK.EXE is run or the system is reset.

SEE ALSO

Page 4-21.

SCAN.EXE   DOS

Scans controllers connected to the SDLP BIOS.

SYNTAX

SCAN [[controller #] | [ALL]]

DESCRIPTION

SCAN is an MS-DOS utility which displays what devices are connected to the selected SDLP controller(s). Output is displayed as: SDLP Unit Number; The Controller : Target, LUN I.D. ; The Device Type; and The Device Name.

Parameters are as follows:

[controller #] as *1, 2, 3, or 4.*   Defines a specific controller to scan.

EXAMPLE:
SCAN 1 scans SDLP Controller One.
SCAN 3 scans SDLP Controller Three.

SCAN ALL Scans all the controllers connected to SDLP.

SCSI.EXE   DOS

Provides a SCSI command shell.

SYNTAX

SCSI [/n]

DESCRIPTION

SCSI.EXE is an MS-DOS utility which provides a mechanism to control
Small-Computer-Systems-Interface devices and peripherals which are con-
nected to the SDLP system.

> **This program is primarily useful to experienced users with a
> high degree of experience with the SCSI standard. It can be
> potentially dangerous to both data and the SCSI device.**

Parameters are as follows: [/n]

Allows the user to manually select a device to use instead of having the
program auto-scan to determine what devices are connected to the
system. Useful for device debugging and analysis purposes, it provides
a mechanism for obtaining request-sense data from a SCSI device which
issued a request sense before the SCSI exerciser was run. (Normally,
the request-sense data would be erased by the auto-scan feature.)

Replaces standard UNIX/XENIX functions to access SST DOS
partitions from UNIX/XENIX.

SYNTAX

setdos

DESCRIPTION

setdos is an ISC UNIX, SCO UNIX / XENIX utility that controls access to
SDLP MS-DOS partitions from the UNIX/XENIX operating system.

SCO UNIX / XENIX

setdos allows the user to specify what SDLP MS-DOS partitions will be
connected to the /dev/hd?d devices. After connecting a MS-DOS partition
to a /dev/hd?d device, the SCO DOS utilities can be used to access the data
on that DOS partition.

EXAMPLE:

To Get a directory of a SDLP MS-DOS partition connected to
/dev/hd2d:

dosdir /dev/hd2d

The user can also specify a drive letter, as in:

dosdir D:

if the */etc/defaults/msdos* file has been properly configured.

SEE ALSO

dosget, dosput, dosdir, SCO UNIX/XENIX Users Guide.

setdos allows the user to specify what SDLP MS-DOS partitions will be connected to the /dev/?p1 device. It also activates or deactivates the DOS utilities.

> **Note that while the Interactive DOS utilities are active, the fdisk program cannot be used.**

After connecting a MS-DOS partition to a *dev/?p1* device, the Interactive DOS file system mount capabilities can also be used.

EXAMPLE

To mount a MS-DOS SDLP partition connected to *dev/2p1*:

mount -f DOS /dev/2p1

If an MS-DOS partition is connected to a *dev/?p1* device, and the DOS utilities have been activated, the DOS utilities can also be used to access the data on the partition.

EXAMPLE

To get a directory of a SDLP MS-DOS partition connected to *dev/0p1*:

dosdir C:

And for the directory of *dev/1p1*:

dosdir D:

SEE ALSO

dosdir, dosget, dosput, mount, Interactive UNIX/386 Users Guide.

SST.EXE   DOS

Provides easy "windowed" access to the SST utilities.

SYNTAX

SST

DESCRIPTION

SST.EXE provides a windowed menu for the Columbia Data Products, Inc.'s SST software utilities. Copy the contents of the SST Utilities diskette, and the SST Installation diskette to a path named "\SSTUTILS" on your hard drive. Add the line "APPEND \SSTUTILS" to your AUTOEXEC.BAT file. Type "SST" and press ENTER. Use the cursor keys or your MicroSoft Mouse or compatible to select and execute the SST utilities.

SSTBIO.SYS   DOS

SST/SDLP BIOS and WDATXT / 7000 device driver.

SYNTAX

DEVICE = SSTBIO.SYS [/W[E | :XX] [/B:XX] [/O[I]] [/S] [/V]
(in config.sys file)

DESCRIPTION

SSTBIO.SYS is an MS-DOS device driver which contains the SST/SDLP BIOS and the drivers for the WD ATXT-FASST and WD 7000-FASST SCSI controller cards. It is loaded by placing the DEVICE = SSTBIO.SYS line in the DOS CONFIG.SYS file.

Parameters are as follows:

[/W[E |:XX]]

These are for use in the expanded/extended memory environments which do not support the Virtual-DMA-Services (VDS) specification. Examples are Windows '386 (versions before release 3.0), PC/MOS '386, DesqView, QEMM (versions prior to release 5.0), and '386 TO THE MAX (versions prior to release 4.0). It sets up an "I/O double-buffer" for the virtualized memory addresses in the expanded/extended memory

systems. "*/W*" creates a 64K buffer. "*/WE*" sets up a 16K buffer. "*/W:XX*" sets up a buffer of the size indicated by "*XX*" in the range of 1K to 64K; e.g., "*/W:4*" would create a 4K memory buffer. The ATXT-FASST does not require this option because it does not employ First Party DMA.

/B:XX (where "XX" is a whole number 00-64)

Specifies how much memory the SDLP BIOS should use for its high-performance range-run buffer. By default it is set at 16K, unless a "/B:" option switch is present. The range is from zero, which turns the buffering off ("*/B:00*"), to 64K ("*/B:64*"), which uses a large amount of internal memory.

[/O[I]]

These options are to enable the write buffer. "/O" sets up a write buffer with no "watchdog timer". Data loss from unexpected power losses is possible with this option. The "/OI" option sets up the write buffer using INT 1C as a "watchdog timer". We recommend using /OI.

[/S]

This enables synchronous mode operation. You must have at least an X5 revision or later 7000-FASST2 controller and a peripheral which supports synchronous mode operation.

[/V]

Using this switch will prompt SSTBIO.SYS to display a detailed listing of SST system memory usage and driver configuration(s) at boot time.

SSTCDROM.SYS   DOS
Drives MSCDEX.EXE (Microsoft CD Extensions).

SYNTAX

DEVICE = SSTCDROM.SYS (in config.sys file)

DESCRIPTION

SSTCDROM.SYS is a Microsoft CD-ROM Extensions driver which is used in conjunction with the MSCDEX.EXE program and a CD-ROM drive connected to an SST controller card. The MSCDEX.EXE program is not

distributed on the SST software diskette and must be obtained from another source, such as the manufacturer of your CD-ROM drive. SSTCDROM.SYS will control any CD-ROM drive connected to any SST controller in your system. Up to 16 CD-ROM drives can be connected at a time. The MSCDEX.EXE program accepts a number of different switches on its command line. Note that these switches are for the MSCDEX.EXE program itself and NOT the SSTCDROM.SYS driver.

MSCDEX /D:$$TCDROM [/E] [/K] [/L:X] [/M:n] [/S] [/V]

/D:$$TCDROM

> Notifies MSCDEX of the logical name previously assigned to the CD-ROM driver. When using SSTCDROM.SYS as your driver, you must use $$TCDROM as the drive name.

/E

> Requests that MSCDEX use expanded memory, if it is available.

/K

> Configures MSCDEX to handle Kanjo volumes.

/L:x

> Notifies MSCDEX to start assigning CD-ROM logical units with drive letter "x".

/M:n

> Specifies the number of buffers which MSCDEX will use to cache CD-ROM sectors. Larger numbers will result in less directory thrashing and improved performance.

/S

> Causes MSCDEX to patch MS-DOS, allowing CD-ROMs to be shared on network servers.

/V

> Requests "verbose" mode; information on memory usage is displayed during MSCDEX installation.

> Note that these command line switches are for the
> MSCDEX.EXE program and NOT the SSTCDROM.SYS driver.

MSCDEX USAGE EXAMPLE:

To use MSCDEX, starting with drive K:

MSCDEX /D:$$TCDROM /L:K

sstconfig   UNIX
Installs and de-installs SST UNIX/XENIX drivers.

SYNTAX

sstconfig

DESCRIPTION

sstconfig is a UNIX/XENIX script file found in the */usr/sst* directory which
installs or de-installs the SST drivers.

SEE ALSO

Page 7-2.

SSTDRIVE.SYS   DOS
Driver for the SST partitioning scheme (SDPS).

SYNTAX

DEVICE = SSTDRIVE.SYS [/E] [/R:X] [/S:X] (in config.sys file)

DESCRIPTION

SSTDRIVE.SYS is an MS-DOS device driver which allows more than two
SST drives or partitions under DOS.

Parameters are as follows:

[/E]

Suppresses non-fatal error messages from SSTDRIVE.SYS. Would allow the use of multiple SST DOS partitions in a system with a UNIX OEM mode device on the bus or other special "unitialized" disk.

[/R:X]

Tells SSTDRIVE to allocate "X" partition letters for each removable device. Default is four drive letters per removable device.

[/S:X]

Allows users of "pre-3.31" DOS to set the maximum block size on removable media to "X", where X may be 0, 1, 2, 4 or 8, to select a block size of 512 bytes, 1K, 2K, 4K or 8K respectively. Compare the chart below with the configuration of your removable media cartridges to choose the correct maximum required sector size. Default is 8K.

Partition Size in MB	DOS Allocation Size		Recommended /S: setting
	Sector	Cluster	
1-32MB	512 byte	2K	0
33-63MB	1K	4K	1
64-127MB	2K	8K	2
128-255 MB	4K	16K	4
256-512 MB	8K	32K	8

SSTFMAT.EXE   DOS
Allows SDLP SCSI device formating.

SYNTAX

SSTFMAT [/M][/HI]

DESCRIPTION

SSTFMAT is an MS-DOS utility for Direct Access Devices which are connected to the SST system.

Parameters are as follows:

[/M]

> Forces the Program into black and white only mode, even if no
> monochrome controller is found. Used for systems on which colors are not
> properly displayed.Forced black and white mode can also be obtained
> by setting the MONO environment variable to TRUE.

> EXAMPLE:
> SET MONO = TRUE

[/HI]

> Allows the program to run in EGA/VGA high resolution 43/50
> line mode.Forced high resolution operation can also be obtained by setting
> the HIREZ environment variable to TRUE.

> EXAMPLE:
> SET HIREZ = TRUE

PROGRAM DESCRIPTION

> This program essentially handles three main activities:

> A) Allows the user to change selectable parameters of the device (with or
> without formatting).

> B) Does a Block Defect Scan to locate and repair defects found.

> C) Executes a Format on the device using user-prepared parameters,
> including Automatic Defect Handling.

A) Changing device parameters

> This includes Options 1 through 3 of the Format Options Menu:

> 1 - VIEW/CHANGE DRIVE CONFIGURATION

> 2 - RESTORE DEFAULT CONFIGURATION

> 3 - RESTORE SAVED CONFIGURATION

The main option is Number 1 above. This will display the device parameters and, if the media allows any changes, the user is allowed to change these, if desired.

Options 2 and 3 are mainly quick return actions to allow the user to return to the originally set Device Default or Saved Parameters without having to re-enter each of the parameters individually.

B) Block defects

This includes Options 4 through 6 of the Format Options Menu:

4 - NON-DESTRUCTIVE SCAN (READ)

5 - DESTRUCTIVE SCAN (READ/WRITE)

6 - VIEW SCANNED DEFECTS

Two methods for detecting defective blocks on your drive are available - either a standard surface scan or a comprehensive scan.

OPTION 4: The surface scan is a non-destructive test of every block on your entire drive and reports the results found during the operation.

OPTION 5: The comprehensive scan WILL destroy the data on your drive! **DO NOT USE THIS ON ANY DRIVE WITH VALUABLE DATA ON IT!** Use of this method of defect testing will **COMPLETELY ELIMINATE** any data on the drive with no chance of recovery **(INCLUDING YOUR PARTI-TIONS)**! However, this method may be more likely to show up as an error on your drive than Option 4 above.

NOTE: You WILL be given every opportunity to abort this procedure prior to the actual scan and during the scan process but even a moment may be all it takes to wipe out your partition tables.

Remapping your defects: This option under comprehensive scan allows you to attempt to repair any defective blocks found, if the media will permit. However, all data in the defective block will be lost. This is particularly critical if the block happens to be in the partition table (which for version 3.36 will be within the first 64 blocks on the drive). Some drives may not permit block reassignment.

OPTION 6: If you have scanned your drive, you may get a report of not just the total defects (as during the scan) but also a breakdown of the number

of defects found in each partition. It is recommended that the partitions containing defective blocks be repaired by using the remapping option in the scan routines or the by reformatting the drive.

C) Formatting your drive

Option 7 of the Format Options Menu:

7 - FORMAT WITH CURRENT CONFIGURATION

OPTION 7: Here is the heart of the utility - The Formatter. You can quickly set up your drive using the above actions and then format your drive using those parameters. Some drives will not accept all parameters and, if this is the case with your specific drive, you will be notified.

This format action will also attempt to use the drive's defect management ability to repair or reallocate any defects found during the format. This should result in a logical 100% defect free device. If your drive will not support this, you will be notified and allowed to do a standard format on your drive. The success of this operation will be reported to you prior to exiting.

> NOTE: Take care not to destroy any of your data by inadvertently formatting or comprehensively scanning your drive.

SSTSETUP.EXE   DOS

Sets up SST partitions and installs the SST system on a hard drive.

SYNTAX

SSTSETUP

DESCRIPTION

SSTSETUP.EXE is an MS-DOS utility which controls the way hard drives are partitioned, creates new partitions on a drive, and provides diagnostics for hard drives. SSTSETUP will also automatically configure DOS partitions. After creating a DOS partition with SSTSETUP, there is no need to run FDISK or FORMAT on the drive.

SEE ALSO

Chapter 4

SSTUTIL.EXE   DOS
Utility for SST Drives and Partitions.

SYNTAX

SSTUTIL

DESCRIPTION

SSTUTIL is a utility for Direct Access Hard Drives, Removable Media
Drives, CD-ROM Drives, and WORM Drives.

The Main Menu of the SST Utility includes the following options:

Change Target ID

Allows you to select the SCSI target ID number of the device you want
to use with the SSTUTIL program.

Read Partition Information

Shows the starting and ending blocks of any SST partitions which reside
on the currently selected device, along with the boot, active, and span
status flags.

Read/Change Block of Data

Provides the ability to view or edit any information that resides on the
selected device. Data is read in a raw, uninterpreted (character) format,
at the block I/O level.

Save/Load Blocks as Files

Allows you to save blocks of data from the device to a file or restore
blocks from a previously saved file.

Copy Drive/Partition

Provides the ability to copy data from one drive to another or to copy a partition to another drive.When copying a partition, you can create a new partition on the destination drive by entering zerofor the destination partition.

Read Device Information

Displays information on aspects of the devices hardware and software configuration, such as number of heads, cylinder skew factor and interleave factor.

TAPEUTIL.EXE   DOS

Provides SDLP tape utilities.

SYNTAX

TAPEUTIL [/M] [/HI] [/DEBUG]

DESCRIPTION

TAPEUTIL is an MS-DOS utility for sequential access devices that are connected to the SST/SDLP system. It provides the following functions:

Clean/Erase - Erases the data on a tape.

Duplicate - Makes copies of a tape.

Examine   - Examines the data on a tape.

Format   - Formats certain kinds of tapes.

Rewind   - Rewinds a tape.

Select Block Size   - Changes the block size of a tape.

Media Retension - Retensions a tape.

Write File - Writes a file out to a tape.

Goto Partition - Changes partitions on partitioning tape drives (such as DAT).

Tape Speed Test - Guages the speed of a tape drive.

Help is available at all times by pressing the F1 key.

Parameters are as follows:

[/M]

> Forces the program into black and white only mode, even if no monochrome controller is found. Used for systems on which colors are not properly displayed.Forced black and white mode can also be obtained by setting the MONO environment variable to TRUE.
>
> EXAMPLE:
> set MONO = TRUE

[/HI]

> Allows the program to run in EGA/VGA high resolution 43/50 line mode.Forced high resolution operation can also be obtained by setting the HIREZ environment variable to TRUE.
>
> EXAMPLE:
> SET HIREZ = TRUE

[/DEBUG]

> Provides debug messages at different points of program operation. Used by experienced users to determine why a device may or may not be working.

TESTDISK.EXE   DOS

Tests disk throughput performance.

SYNTAX

TESTDISK [/I] [/C]

DESCRIPTION

TESTDISK.EXE is an MS-DOS program which measures the I/O through-put performance of any direct-access storage device. It can be used to test SCSI hard drives, ST-506/ESDI hard drives, or even floppy drives.

Parameters are as follows:

[/I]

Disables the on-screen description information.

[/C]

Enables the continuous-run option. TESTDISK will run repeated tests until the <ESC> key is pressed.

UNLOCK.EXE   DOS
Unlocks removable media locked with LOCK.EXE.

SYNTAX

UNLOCK

DESCRIPTION

The unlock command is a DOS utility which enables the eject capability of removable media drives after they have been disabled by LOCK.EXE.

WD7000.SYS   DOS
Initializes a second 7000-FASST2 card.

SYNTAX

DEVICE = WD7000.SYS

DESCRIPTION

WD7000.SYS is a DOS device driver which initializes a second 7000-FASST2 card for multi-card operation. It should be loaded in your CONFIG.SYS after SSTBIO.SYS and before SSTDRIVE.SYS.

SEE ALSO

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wormio   UNIX

Allows for the organization of multiple CPIO images on SCSI WORM devices.

SYNTAX

wormio

DESCRIPTION

worm is a UNIX/XENIX utility found in the */usr/sst* directory which controls access to multiple records on a SST controlled WORM device.

When using the SST system on a WORM drive, a device node */dev/worm* is present. This device can be used as a sequential access device for use with programs such as CPIO. When using the */dev/worm* device as such, multiple "records" can be copied to the WORM drive. The WORM program provides a facility for controlling which sequential "record" will be accessed when data is read from the */dev/worm* device.

The *wormio* program also allows the user to specify an ASCII header string which will be written prior to each WORM "record" to facilitate simplistic tracking of the data in each "record".

APPENDIX I:
ERROR MESSAGES

SST BOOT ROM ERROR MESSAGES

No devices found...

> This error occurs if NO SCSI devices are present on the bus, the devices
> are incorrectly attached, termination is incorrect, there is a hardware
> malfunction, or a conflict of ROM BIOS address, IRQ vector, or DMA
> channel occured.

Spin-up error...

> One of the devices attached to the SST card did not spin up. Verify that
> all drives have good power connections.

Fixed Disk Error...BIOS ABORTED!

> There is a hardware error condition on one of the hard drives on the
> SCSI bus.

ERROR: AT BIOS dated 01/10/84 will not work ...

> The IBM AT BIOS revision dated 01/10/84 will not work with the SST
> system. Contact your dealer for an upgrade of your motherboard ROM
> BIOS chip set.

ERROR: Bad Mem Alloc!

> SST could not get top 1K of system RAM for boot device.

INT 19H Boot Error! System Halted!

> SST could not find a bootable device, there is a disk error during boot,
> or you have an invalid first stage boot loader.

SSTBIO.SYS ERROR MESSAGES

ERROR: Invalid Command Line Parameter...Driver Exited!

This error occurs due to the use of an invalid "/" option.

ERROR: Bad IRQ Selected for ATXT...Driver Exited!

This occurs when you have chosen an Interrupt Request Line(IRQ) which is not supported (See page 2-6).

SSTDRIVE.SYS ERROR MESSAGES

Error: SSTBIO.SYS Not Loaded
Please make sure that SSTBIO.SYS is in your
CONFIG.SYS file and that it is placed BEFORE
SSTDRIVE.SYS

This error is self explanatory.

Error: This device driver will only work with SST software version 3.36!

Load a version 3.36 copy of SSTBIO.SYS and be sure that your SST ROM BIOS is also version 3.36.

Error: No DOS drive letters available for SST Install...

24 logical or physical devices have already been assigned (C:-Z:).
Remove or deactivate prexisting device(s).

Error: No DASD units were found!!
Make sure the SST controller and all cables are
installed properly.

This error is self-explanatory.

Error: The first drive MUST be Unit 0!!
Please refer to your Installation Guide for Instructions.

Your boot device MUST be set to a target ID of zero.

Error: This device driver does not support this DOS version

You are using a DOS version below the supported version (below 3.20).

Error: *DASD Unit xx Not Functioning Properly...*
               Perform Diagnostics on the SST System.

This error requires low-level formatting as well as read-write verification.

Error: *DASD Unit Number xx has NOT been initialized*
               by the SST Partitioning Software. Use SSTSETUP.EXE
               to properly initialize the disk.

You must create partitions on the disk in question in order to use it with the SST software.

Error: *DASD Unit Number xx did not spin up...*
               Perform diagnostics on the SST System.

Use the Advanced Menu in SSTSETUP.EXE to try to determine why the disk did not spin up. Please contact your distributor for assistance.

Error: *DASD Unit Number xx contains non-supported partition(s).*
               Please press any key to continue....

A drive on the SCSI bus has been partitioned by some other partitioning scheme. In the case of UNIX/XENIX OEM/SST mixed mode operation, consider adding the "/E" switch to SSTDRIVE in your DOS CONFIG.SYS. See APPENDIX H, page 11.

If we shadows have offended

Think but this and all is mended,

That you have but slumbered here

While these visions did appear.

And this week and idle theme,

No more yielding than a dream,

Gentles, do not reprehend:

If you pardon, we will mend:

And as I am an honest Puck,

If we have unearned lucked

Now to 'scape the serpent's tongue,

We will make amends ere long;

Else Puck a liar call:

So good night unto you all.

Give me your hands if we be friends,

And Robin shall restore amends.

MSND V-1