SYSGEN   XL SUBSYSTEM

OWNERS MANUAL

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March 1985

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> SYSGEN, INC.
> ATTN: CUSTOMER SERVICE DEPT.
> 47853 WARM SPRINGS BLVD.
> FREMONT, CA. 94539

SYSGEN XL Software: Serial No. _____   Release: _____

Company Name _____

Technical Contact _____

Area Code and Telephone Number _____

Address _____

City _____ State _____ Zip _____

SYSGEN XL Subsystem Serial Number _____

Purchased From _____

Date of Purchase _____

Application Area _____

Amount of Memory Available in your System _____

List of Hardware/Adaptors Used:

        <u>Make</u>   <u>Description</u>

_____

_____

_____

_____

_____

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SECTION 1

INTRODUCTION

1.1   General

The SYSGEN XL subsystem was designed to provide 20 Megabytes of hard disk storage with 60 Megabytes of streaming tape backup for the IBM Personal Computer (PC, XT and AT) using PC-DOS versions 2.0, 2.1, or 3.0.   The SYSGEN XL may function as either a primary disk storage system, or as a complement to the XT's or AT's internal hard disks. The streaming tape back up safeguards your data files stored on the SYSGEN XL and the IBM XT or AT internal hard disk. With this system you may also quickly and easily restore large, archived files on your disk(s) should a catastrophic failure occur while you are working with the active files.   In addition, the SYSGEN XL subsystem allows you to transfer large data files between two IBM Personal Computers equipped with the SYSGEN subsystems, or store archival data efficiently.

The SYSGEN XL subsystem contains a 20-megabyte (formatted) Winchester type hard disk drive and a 60-megabyte (formatted) magnetic tape cartridge.   The magnetic tape cartridge allows tape-to-disk or disk-to-tape transfers at speeds of over 5 million bytes per minute. Through the use of streaming tape technology and superior quality magnetic tape, the SYSGEN XL subsystem can create backups quickly and efficiently.   The user can choose to transfer data by selecting individual files or filesets, or can backup an entire SYSGEN XL disk volume on a cartridge.   The IBM XT or AT disk volumes may only be backed up or restored in the FILESAVE mode of operation.

SYSGEN Inc. is committed to quality products by ensuring that its product design, manufacturing techniques and testing methods are of the highest possible quality. The subsystem you have received has been subjected to a thorough and rigorous testing by SYSGEN Inc. to guarantee that you receive a high quality product.

We recommend that you take a few minutes to familiarize yourself with the contents of this manual before proceeding to the actual unpacking and installation procedure.

1.2   Precautions

Although we will be advising you to disconnect and remove the power from your system during the installation procedure, please be aware

that <u>at no time</u> should you work inside the case with the power still on. Lethal voltages may be present. To avoid the possibility of severe injury, always disconnect the power when working inside the system.

We care !!!

SECTION 2

UNPACKING AND COMPONENT IDENTIFICATION/INSPECTION

2.1   Unpacking the XL Subsystem Unit

All hardware and software required to install and operate your SYSGEN XL subsystem, have been packaged in a specially designed shipping container.   Please save this container and the shock-absorbing inserts, as you may need them while transporting your subsystem.

> NOTE: If you have the SYSGEN XL Disk
> Expansion Unit, refer to the end of this
> section for information on that option.

If the SYSGEN XL subsystem has sustained damage in transit, report it to the carrier immediately.

You have received the following components:

(1) -   SYSGEN XL Subsystem Unit 36-00778-01 (includes standard 20
          Megabyte hard disk and cartridge tape drive)
(1) -   Interface Cable 36-00440-01
(1) -   SYSGEN XL interface board 36-00807-01
(1) -   SYSGEN XL Support Software Diskette 36-00896-01
(1) -   SYSGEN XL owner's manual 36-00897-01

> NOTE: If you do not find all the above
> items when you first inspect the package,
> notify your dealer.

2.2   Component Identification and Inspection (See Figure 2-1)

2.2.1   HARD DISK AND CARTRIDGE TAPE DRIVE UNIT

Remove the SYSGEN XL Unit (Item 1, Figure 2-1) and inspect it. The front side of the unit contains the cartridge loading mechanism. Check the tape drive read/write head carefully to ensure that there are no particles or foreign matter on it. Should you see any foreign matter on the read/write head, go to section 9.1.1 and follow the instructions for cleaning it. This is the only preventive maintenance required on the SYSGEN XL subsystem.

PIN 1 IS RED STRIPED
CABLE EDGE

⑤

②

①

⑥

③

PIN 1 ON TOP

INSTALL CARTRIDGE WITH
LABEL FACING UPWARD

(4)

ITEM LIST
① DISK AND CARTRIDGE TAPE DRIVE
② INTERFACE CABLE
③ SH 9001 INTERFACE BOARD
④ CARTRIDGE
⑤ P.C. COVER
⑥ 37 PIN CONNECTOR
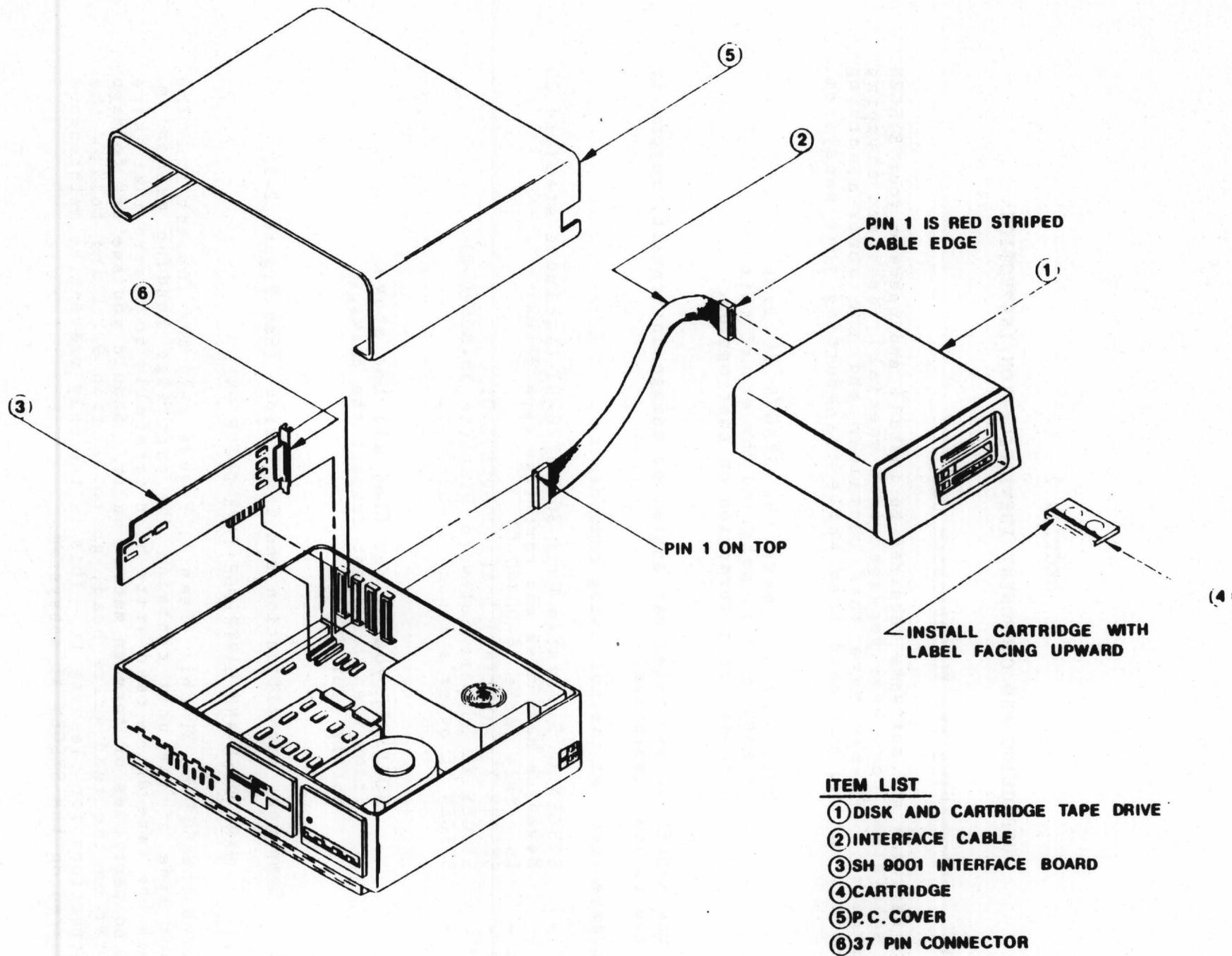
Figure 2-1

2.2.2   SYSGEN XL INTERFACE BOARD

This controller board (shown as Item 3 in Figure 2-1) has an edge finger connector located on the lower right side. These fingers will mate with the connector in your IBM PC.

All of the components, integrated circuits, transistors, etc. are located on one side of the controller board. This side is called the component side, and is distinguished from the other (solder) side of the board.

2.2.3   SYSGEN XL INTERFACE CABLE

This cable is shown as Item 2 in Figure 2-1. The shield and ground strap on the cable must be connected by the steel screw to the rear of the main chassis to provide FCC compliance.

2.2.4   SYSGEN XL SUPPORT SOFTWARE DISKETTE

The diskette that comes with your subsystem is labeled "SYSGEN XL Support Software for IBM PC DOS Version 2.0, 2.1. or 3.0". On the upper right-hand corner of the label is the diskette serial number. Take a minute to record this number on your SYSGEN Inc. License Agreement.

The lower right-hand corner should indicate the release number (i.e. Release 2.10). Please note that this diskette is write-protected for your security. We recommend that you make a working copy of the diskette, and retain the original diskette for a backup/master copy.

2.2.5   SYSGEN XL OWNER'S MANUAL

This manual contains all the information necessary to install and operate your SYSGEN XL subsystem. In addition, if you have the Disk Expansion Unit, installation information for that option is included. All pertinent data has been included to assist the beginning operator as well as the experienced one.

Take the time to become familiar with the contents of the manual before using your SYSGEN XL backup subsystem.

SECTION 3

SPECIFICATIONS AND PREREQUISITES

3.1   Specifications

3.1.1   POWER REQUIREMENTS

           SYSGEN XL Unit
               From PC (for   5 volts: 0.5 Amp (2.5 Watts)
               Interface Board)
               A/C source   115 volts: 2 Amps

3.1.2   OPERATING ENVIRONMENT

           Ambient Temperature   5-40 degrees C (operating)
                                         0-60 degrees C (storage)

           Relative Humidity   20-80% (operating) non-condensing
                                         20-80% (storage) non-condensing

3.1.3   HARDWARE RELIABILITY   10,000 hr. MTBF (calculated)
           (POH)

3.1.4   CARTRIDGE DRIVE SPECIFICATION

           No. of tracks   9 tracks (serpentine)
           Recording format   GCR coding
           Recording density   10,000 flux changes
                                             inch/8000 BPI
           Tape motion   90 inches per second
           Tape start time   300 ms
           Tape stop time   300 ms

3.1.5   CARTRIDGE TAPE   Scotch DC600A, High Density Data
                                         Cartridge

           Capacity   60 Mbytes per cartridge
           Life (usable)   1000 passes
           Length   600 feet

3.1.6   SYSGEN XL INTERFACE BOARD

Electrical characteristics	Conforms to IBM PC, XT, and AT standards
Design	Conforms to IBM PC, XT, and AT standards
Software	I/O register address 280h - 283h DMA channel #3 Non-interrupt-driven

3.1.7   SYSGEN XL HARD DISK DRIVE

The disk drive used in the SYSGEN XL Subsystem is a 5-1/4 inch Winchester type disk specified as:

Formatted capacity	20 Megabytes
Cylinders per Drive	612
Read/Write Heads	4
Sectors per Track	32
Bytes per Sector	256
Average Seek Time	85 milliseconds
Minimum Seek Time	15 milliseconds
Maximum Seek Time	185 milliseconds
Rotational Speed	3600 rpm
Average Latency	8.33 milliseconds

3.2   Prerequisites

System	IBM PC, XT or AT
Software	PC DOS Version 2.0 or 2.10 (IBM PC and XT) PC DOS Version 3.0 (IBM AT)
Power	As specified in Section 3.1.1

SECTION 4

HARDWARE INSTALLATION

4.1   Tools Required

1 6-inch standard screwdriver

4.2   Installation - General

The following procedures will walk you through the installation of the
SYSGEN XL subsystem hardware components. In addition, if you have the
Disk Expansion Unit, procedures are included at the end of this
section that describe installation of the Disk Expansion Unit in the
SYSGEN XL Unit chassis.

> NOTE: Prior to installing any components,
> please ensure your IBM PC is functioning
> properly by running your diagnostics.

Turn power On-Off switch to the Off position.
Turn power On-Off switch on all your peripherals attached to your PC
to the Off position.
Remove the A/C power cord from the wall socket or power source and
from the PC main chassis.

4.2.1   INSTALLATION OF THE SYSGEN XL SUBSYSTEM (IBM PC, XT AND AT)

1. Remove the IBM PC chassis top cover by removing the 5 screws from
the rear of the PC main chassis. (See Figure 2-1, Item 5). Carefully
slide the cover off ensuring that the cover does not catch on the
internal wiring harness.

2. Locate any unused I/O connector on the PC main board (located on
the left hand side of the main chassis as you face the front of the
IBM PC).

3. Remove the blank connector plate located on the rear chassis panel
(see Figure 2-1) and retain the screw.

4. Insert the SYSGEN XL Subsystem Interface board (Item 3 in Figure
2-1) into the empty slot. Ensure that the rear connector (Item 6 in
Figure 2-1) is properly positioned in the rear chassis panel.

4-1

5. Secure the rear bracket to the rear chassis panel by using the screw removed in step 3.

6. Connect the 37-pin interface cable (Item 2 in Figure 2-1) from the SYSGEN XL Subsystem Unit data connector to the rear connector (Item 6 in Figure 2-1) on the SYSGEN XL Interface board. Ensure that the connectors mate before inserting them. Verify that the ground shield tabs on both ends of the 37-pin interface cable are connected to connector mounting screws and tighten the mounting screws. This is required in order to comply with the FCC regulations.

7. Ensure that all modules are securely seated and replace the IBM chassis cover.

8. Reconnect the power cord for the IBM Personal Computer and connect the XL Subsystem power cord to an appropriate A/C outlet.

4.2.2   POWER ON PROCEDURE

When you are sure everything is connected correctly, switch the SYSGEN XL Subsystem AC power switch to ON and wait 30 seconds for the hard disk to reach proper operating speed. Then switch the PC ON/OFF switch to the ON position.

Should "POST" (the IBM PC Power-on Self Test) indicate any errors, turn the power off and recheck all connections, cabling, etc. done in this section. If this fails to reveal any problems or bad connections, please call your dealer, the SYSGEN Inc. regional support center closest to you, or call SYSGEN Inc. factory technical support directly.

4.3   SYSGEN XL TRANSIT DAMAGE CHECK

Proceed as follows:

a. Reboot the system with the original IBM DOS system diskette by pressing the Ctrl, Alt, and Del keys simultaneously.

b. If you have a PC with two floppy disk drives, place the SYSGEN XL Support Software diskette into drive B: and skip to step d.

c. If you have a single floppy disk IBM PC, a XT or an AT, with one floppy disk, place the SYSGEN XL support software diskette in the floppy disk drive. The system will prompt you when to change diskettes. Remember that the IBM DOS diskette is A: and the SYSGEN XL diskette is B:.

d. Type in B:$CDSKTST as follows to check the standard SYSGEN XL hard disk and press carriage return:

    A>B:$CDSKTST <CR>   (<CR> = carriage return)

The following messages will display:

SCDSKTST V 2.1   --   SYSGEN XL Hard Disk Maintenance Utility
Copyright (c) 1983 Sysgen Inc.

Checking Cylinder x, head y   (x and y change as test is run)
Check track pass completed.
No problem detected on disk drive.

After running this program, the Volumes on the hard disk
will remain inaccessible until the system is rebooted.

    A>

                              NOTE

          The program may report that "NEW TRACK(S)
          WITH DEFECTS WERE DETECTED." If
          additional defects are found, you must
          run $CDSKTST/F to include all defects.
          Refer to the description of the $CDSKTST
          utility in Chapter 6 for further informa-
          tion on running $CDSKTST/F.

e. Reboot the system with the original IBM DOS system diskette by
    pressing the Ctrl, Alt, and Del keys simultaneously. (This step is
    mandatory.)

              NOTE: If you have the Disk Expansion Unit
              installed, refer to paragraph 4.5 for
              transit damage checkout procedures.

SECTION 5

·SOFTWARE INSTALLATION

5.1   Introduction

The SYSGEN XL support software diskette contains the configuration and
utility programs required to operate the SYSGEN XL subsystem. This
diskette is intended to be used with IBM PC's, XT's, or AT's using IBM
PC DOS 2.0, 2.1, or 3.0. There are no modifications required to your
operating system software. Section 6 provides a description of the
various utility software programs.

The diskette provided with the SYSGEN XL subsystem is clearly marked
for use with IBM PC DOS 2.0, 2.1 or 3.0. The following discussion
applies to all three versions of the operating system unless otherwise
stated.

> NOTE: The software will **NOT** work with the
> older PC DOS 1.0 and 1.1.

In the procedures that follow, reference will be made to floppy disk
drives A and B. For a user with a single floppy drive system configu-
ration, the operating system automatically prompts you to switch
diskettes at the right time. The sequence to follow for installing
the software is shown in Figure 5-1.

> NOTE: If you have a single floppy drive
> system, pay particular attention to which
> diskette is A: and which is B: as you
> change them.

5.2   Safeguarding the IBM and SYSGEN Distribution Diskettes

Make working copies of the original, unmodified IBM Personal Computer
Disk Operating System (PC DOS) distribution diskette and of the SYSGEN
XL Support Software diskette. The procedure for copying diskettes is
described in the IBM PC GUIDE TO OPERATIONS MANUAL, Operations
Section, page "DOS 3-57". To assure correct installation these
working diskettes must be exact copies of the original distribution
diskettes. (The "working copy" of the IBM PC DOS that you copied will
be modified by the installation procedure for operation with the
SYSGEN XL subsystem.) Reboot the system with the PC DOS "working
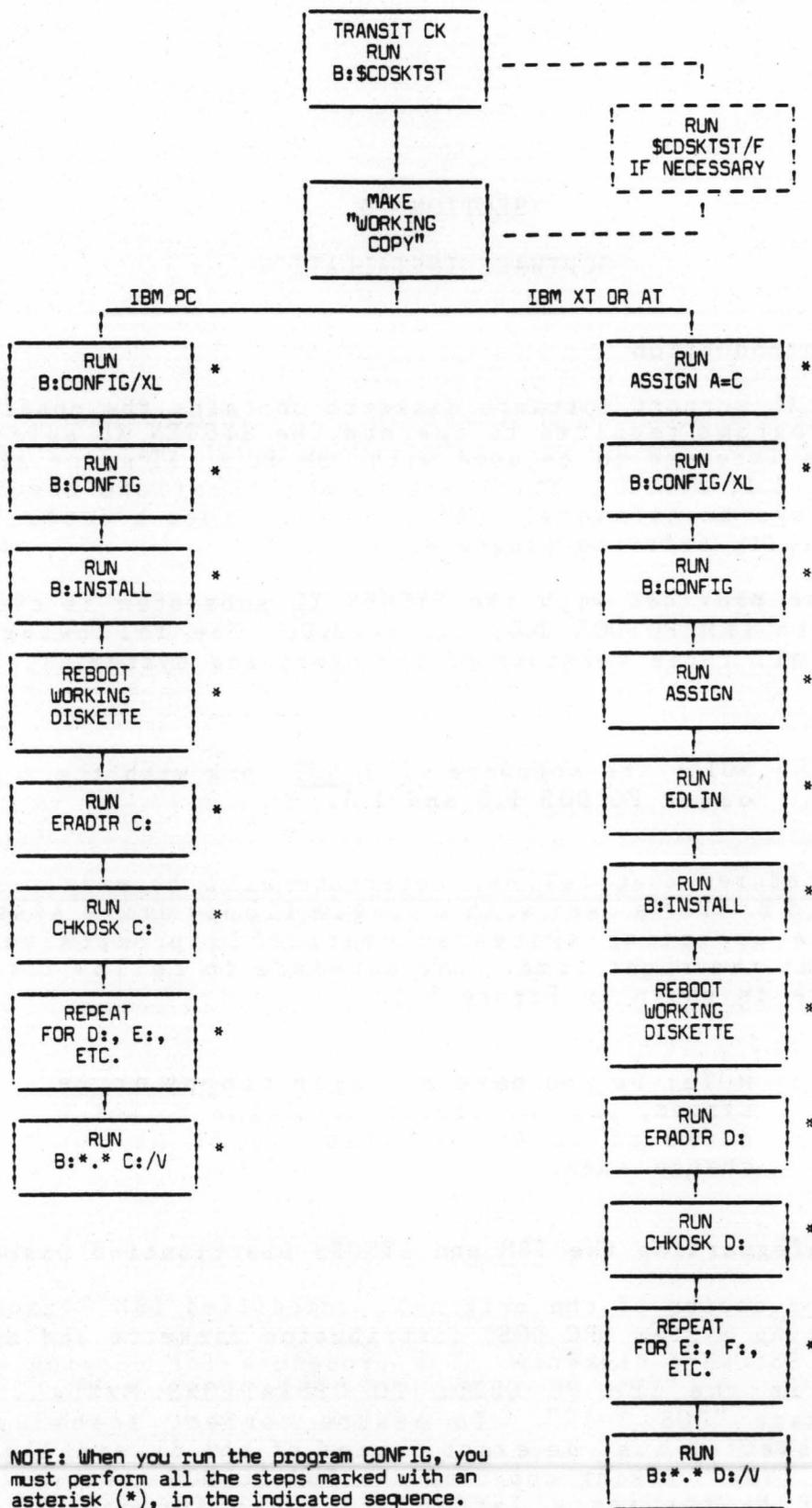copy" diskette and proceed with the software installation procedure.

```
                    +----------------+
                    |  TRANSIT CK    |
                    |     RUN        |- - - - - - - - - - - - -!
                    |  B:$CDSKTST    |                        |
                    +----------------+                        |
                             |              +-------------------+
                             |              |      RUN          |
                             |              |   $CDSKTST/F       |
                             |              |   IF NECESSARY     |
                             |              +-------------------+
                    +----------------+                 |
                    |     MAKE       |                 |
                    |   "WORKING     |- - - - - - - - -+
                    |    COPY"       |
                    +----------------+
   IBM PC                    |                      IBM XT OR AT
+------------------------------------------------------------------+
        |                                                  |
+----------------+  *                          +----------------+  *
|     RUN        |                             |     RUN        |
|  B:CONFIG/XL   |                             |  ASSIGN A=C    |
+----------------+                             +----------------+
        |                                              |
+----------------+  *                          +----------------+  *
|     RUN        |                             |     RUN        |
|   B:CONFIG     |                             |  B:CONFIG/XL   |
+----------------+                             +----------------+
        |                                              |
+----------------+  *                          +----------------+  *
|     RUN        |                             |     RUN        |
|   B:INSTALL    |                             |   B:CONFIG     |
+----------------+                             +----------------+
        |                                              |
+----------------+  *                          +----------------+  *
|    REBOOT      |                             |     RUN        |
|   WORKING      |                             |    ASSIGN      |
|   DISKETTE     |                             +----------------+
+----------------+                                     |
        |                                      +----------------+  *
+----------------+  *                          |     RUN        |
|     RUN        |                             |    EDLIN       |
|   ERADIR C:    |                             +----------------+
+----------------+                                     |
        |                                      +----------------+  *
+----------------+  *                          |     RUN        |
|     RUN        |                             |   B:INSTALL    |
|   CHKDSK C:    |                             +----------------+
+----------------+                                     |
        |                                      +----------------+  *
+----------------+  *                          |    REBOOT      |
|    REPEAT      |                             |   WORKING      |
|  FOR D:, E:,   |                             |   DISKETTE     |
|     ETC.       |                             +----------------+
+----------------+                                     |
        |                                      +----------------+  *
+----------------+  *                          |     RUN        |
|     RUN        |                             |   ERADIR D:    |
|  B:*.* C:/V    |                             +----------------+
+----------------+                                     |
                                               +----------------+  *
                                               |     RUN        |
                                               |   CHKDSK D:    |
                                               +----------------+
                                                       |
                                               +----------------+  *
                                               |    REPEAT      |
                                               |  FOR E:, F:,   |
                                               |     ETC.       |
                                               +----------------+
                                                       |
     NOTE: When you run the program CONFIG, you +----------------+  *
     must perform all the steps marked with an  |     RUN        |
     asterisk (*), in the indicated sequence.   |  B:*.* D:/V    |
                                                +----------------+
```

Figure 5-1 Software Installation Sequence

5.3   SYSGEN XL Subsystem Hard Disk Configuration

The SYSGEN XL subsystem hard disk can be subdivided into a maximum of sixteen units called disk volumes. These disk volumes are then treated by the operating system as though they were individual disk drives. In operation, these disk volumes are identified as C:, D:, etc, the same way that the floppy disk drives are referred to as A: and B:. In addition, 160 bytes on the SYSGEN XL hard disk are taken up for track defect handling and 280 Kbytes are taken up as a working area for the FILESAVE.EXE utility program.

The utility programs required to configure the SYSGEN XL subsystem hard disk for operation with your IBM PC, XT or AT are provided on the SYSGEN XL Subsystem Support Software diskette which comes with your SYSGEN XL Subsystem. Refer to Section 6 for additional details on the operation of these utility programs. Figure 5-1 shows the sequence to follow for installing the software.

If this is a first time installation, you should have already run the maintenance utility $CDSKTST.EXE (as described in paragraph 4.3). $CDSKTST.EXE is used to perform a transit damage check on the SYSGEN XL hard disk when you have finished the hardware installation procedures. This utility program may also be used to check the hard disk for bad tracks at any time, for example, when the SYSGEN XL subsystem hard disk is being reconfigured or you feel there is a problem. Refer to the maintenance procedures for handling unexpected bad tracks contained in Section 9. Refer to Section 6 for additional information on the operation of $CDSKTST.EXE.

Procedures for configuring the 20 Megabyte SYSGEN XL subsystem hard disk as a single disk volume (factory standard configuration), as two disk volumes of equal size, or as four disk volumes of equal size are contained paragraphs 5.3.1 through 5.3.6. Separate procedures are provided for the IBM PC or the IBM XT and AT systems (refer to Table 5-1.) Each of these procedures (paragraphs) contains a complete set of configuration instructions. The user should select the desired SYSGEN XL configuration for his system from Table 5-1 and refer to the specific paragraph listed for the procedure to accomplish the desired configuration.

The disk volume configuration data used in the procedures contained in this section is listed in Table 5-2. This configuration data consists of the number volumes being configured, the logical disk number/designator, the logical disk volume size in number of blocks, and the volume size in K bytes. If the user wishes to configure the SYSGEN XL with more than four volumes, the procedure for configuring the specific IBM system for four hard disk volumes should be used as a guide.

Paragraph 5.3.7 provides information on changing the number of directory files available in a disk volume and changing the cluster size within the disk volume.

TABLE 5-1.   SYSGEN XL SUBSYSTEM CONFIGURATION PROCEDURES

IBM SYSTEM	SYSGEN XL CONFIGURATION	PARAGRAPH
PC*	Factory Standard Configuration	5.3.1
PC*	Two Hard Disk Volumes	5.3.2
PC*	Four Hard Disk Volumes	5.3.3
XT or AT	Factory Standard Configuration	5.3.4
XT or AT	Two Hard Disk Volumes	5.3.5
XT or AT	Four Hard Disk Volumes	5.3.6

* If you already have an IBM hard disk installed on your PC, treat it as a XT for installing the SYSGEN XL subsystem.

TABLE 5-2   SYSGEN XL HARD DISK VOLUME CONFIGURATION DATA

# OF VOLUMES	LOGICAL DISK NUMBER PC	XT/AT	# OF BLOCKS/VOLUME (LOGICAL DISK SIZE)	VOLUME SIZE (K BYTES)
1	1 = C:	1 = D:	76,930	19,232.5
2	1 = C:	1 = D:	38,465	9,616.25
	2 = D:	2 = E:	38,465	9,616.25
4*	1 = C:	1 = D:	19,232	4,808
	2 = D:	2 = E:	19,232	4,808
	3 = E:	3 = F:	19,232	4,808
	4 = F:	4 = G:	19,232	4,808

* Two blocks are left over when configuring 4 volumes of even size. These are designated "Number of Blocks Available".

5.3.1 FACTORY STANDARD CONFIGURATION INSTALLATION ON YOUR PC WITH
NO HARD DISK DRIVE

To accomplish the factory standard configuration installation for an
IBM PC with one or two floppy disk drives and no hard disk drive,
perform the following procedure.

> NOTE: If this is a first time installa-
> tion you should have already run
> $CDSKTST.EXE at the end of the Hardware
> installation procedure. Verify that this
> utility program has been run before
> continuing with the following procedure.
> Refer to paragraph 4.3 and to Section 6
> for information on running the
> $CDSKTST.EXE utility.

a. Place the unmodified IBM PC DOS "working diskette" created in
    paragraph 5.2 in drive A: and boot the system by pressing the
    Ctrl, Alt, and Del keys simultaneously.

b. Place the SYSGEN XL Support Software "working diskette" in drive
    B:. (If you have a single floppy disk system, the operating system
    will prompt you when to change diskettes during the following
    procedure.)

> NOTE: <CR> = carriage return
>   [ ] = default values
>   Boldface = system prompts
>   Underlined = operator responses

The CONFIG.EXE utility program is used to define the SYSGEN XL hard
disk configuration. This configuration step prepares the hardware
characteristics data for use in the subsequent installation. It also
gives the user the option of dividing the hard disk into volumes in
his own way, rather than using the factory standard configuration. If
you respond with <CR> (carriage return) to the questions that are
presented on the screen when the program is running, you will
implement the factory standard configuration (the default values).

c. Type in B:CONFIG/XL at the system prompt as follows and press the
    carriage return.

    A>B:CONFIG/XL <CR>

d. The system will respond with the following:

    VOLUMES C configured: 76930 blocks (19232.5 K bytes) each.

    A>

e. Type in <u>B:CONFIG</u> at the system prompt as follows and press the carriage return.

    A><u>B:CONFIG</u> <CR>

f. The system will respond with the following:

    CONFIG V 2.10A -- SYSGEN XL Subsystem Configuration Program
    Copyright (c) 1983 Sysgen, Inc.

    Do you want to use standard factory configuration? [Y]

                    NOTE: <CR> = carriage return
                          [ ] = default values
                          Boldface = system prompts
                          <u>Underlined</u> = operator responses

g. Type in <CR> and after a few seconds the system will respond with the following message.

    VOLUMES C configured: 76930 blocks (19232.5 K bytes) each.

    A>

                    N O T E : Each time CONFIG.EXE is run to
                    define the hard disk configuration,
                    INSTALL must be run, as described in the
                    following paragraphs, to install the disk
                    parameters and produce a modified PC DOS
                    "working diskette" for use with the
                    SYSGEN XL subsystem.

h. Type in <u>B:INSTALL</u> as follows and press <CR>. On a single floppy disk unit system the operating system will prompt the user to change diskettes several times. Remember that the PC DOS "working diskette" is A: and the XL Support Software "working diskette" is B:.

    A><u>B:INSTALL</u> <CR>

i. The system will display the following series of messages during the installation process.

    A>copy b:harddisk.sys a:/v

        1 File(s) copied

    A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

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```
CUSTOMIZATION COMPLETED.

A>copy b:config.sys a:/v

       1 File(s) copied

A>copy b:eradir.com a:/v

       1 File(s) copied

A>rem

A>rem

A>rem  NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE

A>rem

A>rem

A>
```

j. Reboot the system with your newly modified PC DOS "working diskette" by pressing the Ctrl, Alt, and Del keys simultaneously.

k. You must now initialize all disk volume directories.

l. Type in ERADIR C: as follows and press <CR>.

    A>ERADIR C: <CR>

m. The following question will display.

    Erase all files on volume C: (Y/N)?

n. Type in Y and press <CR>. The system will display the following messages.

    Directory being erased...
    Directory cleared on volume C.

o. Type in CHKDSK C: at the A> prompt and the system will display the following message.

    19660800 bytes total disk space
    19660800 bytes available on disk
    262144 bytes total memory (depending on your memory size)
    234192 bytes free

You should now copy the remaining SYSGEN XL support software utility programs to SYSGEN XL volume C:. To accomplish this the following procedure may be used.

a. Make sure the SYSGEN XL support software "working diskette" is in drive B:. If you have a single floppy disk drive system, the operating system will prompt you when to change diskettes.

b. Type in <u>COPY B:*.* C:/V</u> at the system prompt and press <CR> (carriage return).

c. The system will transfer all of the utility programs and files on the Support Software "working diskette" to volume C: on the SYSGEN XL subsystem.

You have now completed the Factory Standard Installation for your SYSGEN XL subsystem. Your SYSGEN XL subsystem hard disk is now configured as volume C: with 19,660,800 bytes of disk storage available, space for up to 512 directory entries is available and the standard cluster size is 8 Kbytes. If you wish to subdivide your SYSGEN XL subsystem hard disk into more than one volume, refer to Table 5-1 to determine the paragraph number of the specific procedure that describes the configuration you desire. If you wish to modify the maximum number of directory entries available or the cluster size refer to paragraph 5.3.7 in this section.

```
***********
* CAUTION *
***********
```

You may only restore a Volume Image backup (using PRESERVE.EXE) to another volume if the characteristics of the two volumes are identical, i.e., same size clusters and same number of directory entries.

5.3.2   INSTALLING THE XL WITH TWO VOLUMES ON YOUR PC WITH NO HARD
         DISK DRIVE

To configure your 20 Mbyte SYSGEN XL subsystem hard disk into two
volumes of equal size on an IBM PC with one or two floppy disk drives
and no hard disk drive, perform the following procedure.

a. Place the IBM PC DOS "working diskette" in drive A: and boot the
    system by pressing the Ctrl, Alt, and Del keys simultaneously.

b. Place the SYSGEN XL Support Software "working diskette" in drive
    B:. (If you have a single floppy disk system, the operating system
    will prompt you when to change diskettes.)

                 NOTE: <CR> = carriage return
                       [ ] = default values
                       Boldface = system prompts
                       Underlined = operator responses

c. Type in B:CONFIG/XL at the system prompt as follows and press the
    carriage return.

         A>B:CONFIG/XL <CR>

d. The system will respond with the following:

    VOLUMES C configured: 76930 blocks (19232.5 K bytes) each.

    A>

e. Type in B:CONFIG at the system prompt as follows and press the
    carriage return.

         A>B:CONFIG <CR>

f. The system will respond with the following:

    CONFIG V 2.10 -- SYSGEN XL Subsystem Configuration Program
    Copyright (c) 1983 Sysgen, Inc.

    Do you want to use standard factory configuration? [Y]

g. Type in "n" and press <CR> (carriage return).

h. The system will respond with the following messages and questions.
    The values shown as defaults (between the brackets [ ]) in the
    following questions are the actual values for the standard XL
    subsystem, without a Disk Expansion installed. These values should
    appear as defaults. Verify that the default values are correct,
    otherwise type in the correct values before pressing <CR>. Perform
    the following sequence, entering the indicated values when
    prompted.

NOTE: To determine the number to be entered in response to the "Logical Disk Size?" question in the following procedure, delete volume C: as shown, then take the number of blocks listed as "Number of Blocks Available =" and divide that number by the number of disk volumes you wish to configure. For example, the number of blocks available listed in the following example is <u>76,930</u> and the number of volumes being configured is 2. This indicates that the number of logical blocks per volume would be equal to <u>38,465</u>. Enter this result as the "Logical Disk Size?" in the following procedure. The total number of blocks available for partitioning can also be determined from the message output that appears when "CONFIG/XL" is run at the beginning of this procedure. Refer to Table 5-2 for additional configuration data information.

Please input physical disk characteristics as follows.

```
Last Cylinder Number? [611] <CR>
Last Head Number?       [3] <CR>
Last Sector Number?    [31] <CR>
Drive Constant?         [1] <CR>
Disk Flag?              [0] <CR>
```

              For Tape Unit:
Tape drive type code? [8] <CR>

```
    0 - Exit Program
    1 - Change Logical Disk Size
    2 - Change Volume to Logical Disk Assignment
```

Select Operation (0 -- 2)? <u>1</u> <CR>

LOGICAL DISK SIZE ALLOCATION:

```
Disk Num      Vol      Address      Num of Blocks
    1          C:         766          76930        ( 19232.5 K bytes)
Number of Blocks Available = 0
```

Add, Delete, or No-change? <u>d</u> <CR>
Logical Disk Number (1 - 16)? [1] <CR>

```
LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
Number of Blocks Available = 76930
Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] <CR>
Logical Disk Size? 38465 <CR>            (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
    1          C:         766          38465      (  9616.25K bytes)
Number of Blocks Available = 38465

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 2 <CR>
Logical Disk Size? 38465 <CR>            (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
    1          C:         766          38465      (  9616.25K bytes)
    2        UNUSED      39231         38465      (  9616.25K bytes)
Number of Blocks Available = 0


Add, Delete, or No-change?  n <CR>
```

i. The system will display the following menu.

```
        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment
```

```
Select Operation (0 -- 2)?  2 <CR>

VOLUME ASSIGNMENTS:

        Vol          Type        Number
        A:         Floppy          0
        B:         Floppy          1
        C:         Hard Disk       1

Do you want to change assignments?      y <CR>
Change Which Volume (A - P)?  d <CR>
Change Volume to Floppy, Hard-disk, or Unused?  h <CR>
Logical Disk Number (1 - 16)?  [1] 2 <CR>
```

```
VOLUME ASSIGNMENTS:

            Vol         Type         Number
            A:          Floppy          0
            B:          Floppy          1
            C:          Hard Disk       1
            D:          Hard Disk       2

    Do you want to change assignments?  n <CR>


j.  The system will display the following menu.

        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment

    Select Operation (0 - 2)?  0 <CR>

    A>


                NOTE: Each time CONFIG.EXE is run to
                define the hard disk configuration,
                INSTALL must be run, as described in the
                following paragraphs, to install the disk
                parameters and produce a modified PC DOS
                "working diskette" for use with the
                SYSGEN XL subsystem.


k.  Type  in  B:INSTALL as follows and press <CR>.  On a single floppy
    disk  unit  system  the operating system will prompt the user  to
    change diskettes several times.  Remember that the PC DOS "working
    diskette" is A:  and the XL Support Software "working diskette" is
    B: .

    A>B:INSTALL <CR>

l.  The  system will display the following series of  messages  during
    the installation process.

    A>copy b:harddisk.sys a:/v

        1 File(s) copied

    A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

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    CUSTOMIZATION COMPLETED.

    A>copy b:config.sys a:/v
```

```
              1 File(s) copied

        A>copy b:eradir.com a:/v

              1 File(s) copied

        A>rem

        A>rem

        A>rem  NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE

        A>rem

        A>rem

        A>
```

m. Reboot the system with the newly modified PC DOS "working diskette" by pressing the Ctrl, Alt, and Del keys simultaneously.

> NOTE: You must initialize all the SYSGEN XL disk volume directories after these disk volumes are configured and installed. Perform the following steps.

n. Type in <u>ERADIR</u> <u>C:</u> as follows and press <CR>.

    A><u>ERADIR</u> <u>C:</u> <CR>

o. The following question will display.

    Erase all files on volume C: (Y/N)?

p. Type in <u>Y</u> and press <CR>. The system will display the following messages.

    Directory being erased...
    Directory cleared on volume C.

q. Type in <u>CHKDSK</u> <u>c:</u> at the A> prompt and the system will display the following message.

    9822208 bytes total disk space
    9822208 bytes available on disk
    262144 bytes total memory (depending on your memory size)
    234096 bytes free

r. Repeat steps n. through q. for disk volume D: to initialize the volume D: directory.

You have now finished configuring the SYSGEN XL subsystem with two hard disk volumes on your IBM PC. You should now copy the remaining SYSGEN XL support software utility programs to volume C: on the SYSGEN XL subsystem. To accomplish this the following procedure may be used.

a. Make sure the SYSGEN XL support software "working diskette" is in drive B:. If you have a single floppy disk drive system, the operating system will prompt you when to change diskettes.

b. Type in <u>COPY B:*.* C:/V</u> at the system prompt and press <CR> (carriage return).

c. The system will transfer all of the utility programs and files on the Support Software "working diskette" to volume C: on the SYSGEN XL subsystem.

The SYSGEN XL subsystem hard disk is now configured as volume C: and volume D:. Each volume contains 9,822,208 bytes of available disk storage, space for up to 512 directory entries is available and the standard cluster size is 8 Kbytes. If you wish to further subdivide your XL subsystem hard disk, refer to Table 5-1 to determine the paragraph number of the specific procedure that describes the configuration you desire. If you wish to modify the maximum number of directory entries available or the cluster size refer to paragraph 5.3.7 in this section.

```
***********
* CAUTION *
***********
```

You may only restore a Volume Image backup (using PRESERVE.EXE) to another volume if the characteristics of the two volumes are identical, i.e., same size clusters and same number of directory entries.

5.3.3 INSTALLING THE SYSGEN XL WITH FOUR VOLUMES ON YOUR PC WITH NO HARD DISK

To configure your 20 Mbyte SYSGEN XL subsystem hard disk into four volumes of equal size on an IBM PC with one or two floppy disk drives and no hard disk drive, perform the following procedure.

a. Place the IBM PC DOS "working diskette" in drive A: and boot the system by pressing the Ctrl, Alt, and Del keys simultaneously.

b. Place the SYSGEN XL Support Software "working diskette" in drive B:. (If you have a single floppy disk system, the operating system will prompt you when to change diskettes.)

>   NOTE: <CR> = carriage return
>   [ ] = default values
>   Boldface = system prompts
>   Underlined = operator responses

c. Type in B:CONFIG/XL at the system prompt as follows and press the carriage return.

    A>B:CONFIG/XL <CR>

d. The system will respond with the following:

    Volume(s) C configured: 76930 blocks (19232.5 K bytes).

e. Type in B:CONFIG at the system prompt as follows and press the carriage return.

    A>B:CONFIG <CR>

f. The system will respond with the following:

    CONFIG V 2.10A -- SYSGEN XL Subsystem Configuration Program
    Copyright (c) 1983 Sysgen, Inc.

    Do you want to use standard factory configuration? [Y]

g. Type in n as follows and press <CR> (carriage return).

h. The system will respond with the following messages and questions. The values shown as defaults (between the brackets []) in the following questions are the actual values for the standard XL subsystem, without an additional hard disk drive. These values should appear as defaults. Verify that the default values are correct, otherwise type in the correct values before pressing <CR>. Perform the following sequence, entering the indicated values when prompted.

NOTE: To determine the number to be
entered in response to the "Logical Disk
Size?" question in the following
procedure, delete volume C: as shown,
then take the number of blocks listed as
"Number of Blocks Available =" and divide
that number by the number of disk volumes
you wish to configure. For example, the
number of blocks available listed in the
following example is <u>76,930</u> and the
number of volumes being configured is 4.
This indicates that the number of logical
blocks per volume would be equal to
<u>19,232</u>. Enter this result as the "Logical
Disk Size?" in the following procedure.
The total number of blocks available for
partitioning can also be determined from
the message output that appears when
"CONFIG/XL" is run at the beginning of
this procedure. Refer to Table 5-2 for
additional configuration data informa-
tion.

Please input physical disk characteristics as follows.

```
Last Cylinder Number? [611] <CR>
Last Head Number?      [3]   <CR>
Last Sector Number?    [31]  <CR>
Drive Constant?        [1]   <CR>
Disk Flag?             [0]   <CR>
```

```
                For Tape Unit:
Tape drive type code?  [8] <CR>
```

```
    0 - Exit Program
    1 - Change Logical Disk Size
    2 - Change Volume to Logical Disk Assignment
```

Select Operation (0 -- 2)? <u>1</u> <CR>

LOGICAL DISK SIZE ALLOCATION:

```
Disk Num    Vol    Address    Num of Blocks
   1        C:       766         76930         ( 19232.5 K bytes)
Number of Blocks Available = 0
```

Add, Delete, or No-change? <u>d</u> <CR>
Logical Disk Number (1 - 16)? [1] <CR>

```
LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address    Num of Blocks
Number of Blocks Available = 76930
Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] <CR>
Logical Disk Size? 19232 <CR>              (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address    Num of Blocks
    1          C:         766        19232        (  4808   K bytes)
Number of Blocks Available = 57698

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 2 <CR>
Logical Disk Size? 19232 <CR>              (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address    Num of Blocks
    1          C:         766        19232        (  4808   K bytes)
    2        UNUSED      19998       19232        (  4808   K bytes)
Number of Blocks Available = 38466

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 3 <CR>
Logical Disk Size? 19232 <CR>              (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address    Num of Blocks
    1          C:         766        19232        (  4808   K bytes)
    2        UNUSED      19998       19232        (  4808   K bytes)
    3        UNUSED      39230       19232        (  4808   K bytes)
Number of Blocks Available = 19234

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 4 <CR>
Logical Disk Size? 19232 <CR>              (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address    Num of Blocks
    1          C:         766        19232        (  4808   K bytes)
    2        UNUSED      19998       19232        (  4808 · K bytes)
    3        UNUSED      39230       19232        (  4808   K bytes)
    4        UNUSED      58462       19232        (  4808   K bytes)
Number of Blocks Available = 2

Add, Delete, or No-change?  n <CR>
```

i. The system will display the following menu.

```
            0 - Exit Program
            1 - Change Logical Disk Size
            2 - Change Volume to Logical Disk Assignment

Select Operation (0 -- 2)?  2 <CR>

VOLUME ASSIGNMENTS:

            Vol             Type            Number
            A:          Floppy                 0
            B:          Floppy                 1
            C:          Hard Disk              1

Do you want to change assignments?  y <CR>
Change Which Volume (A - P)?  d <CR>
Change Volume to Floppy, Hard-disk, or Unused?  h <CR>
Logical Disk Number (1 - 16)?  [1]  2

VOLUME ASSIGNMENTS:

            Vol             Type            Number
            A:          Floppy                 0
            B:          Floppy                 1
            C:          Hard Disk              1
            D:          Hard Disk              2

Do you want to change assignments?  y <CR>
Change Which Volume (A - P)?  e <CR>
Change Volume to Floppy, Hard-disk, or Unused?  h <CR>
Logical Disk Number (1 - 16)?  [1]  3

VOLUME ASSIGNMENTS:

            Vol             Type            Number
            A:          Floppy                 0
            B:          Floppy                 1
            C:          Hard Disk              1
            D:          Hard Disk              2
            E:          Hard Disk              3

Do you want to change assignments?   y <CR>
Change Which Volume (A - P)?  f <CR>
Change Volume to Floppy, Hard-disk, or Unused?  h <CR>
Logical Disk Number (1 - 16)?  [1]  4

VOLUME ASSIGNMENTS:

            Vol             Type            Number
            A:          Floppy                 0
            B:          Floppy                 1
            C:          Hard Disk              1
            D:          Hard Disk              2
            E:          Hard Disk              3
            F:          Hard Disk              4
```

Do you want to change assignments? n <CR>

j. The system will respond with the following menu.

        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment

    Select Operation (0 - 2)? 0 <CR>

    A>

            NOTE: Each time CONFIG.EXE is run to
            define the hard disk configuration,
            INSTALL must be run, as described in the
            following paragraphs, to install the disk
            parameters and produce a modified PC DOS
            "working diskette" for use with the
            SYSGEN XL subsystem.

k. Type in B:INSTALL as follows and press <CR>. On a single floppy
    disk   unit system the operating system will prompt the user to
    change diskettes several times. Remember that the PC DOS "working
    diskette" is A: and the XL Support Software "working diskette" is
    B:.

    A>B:INSTALL <CR>

l. The system will display the following series of messages during
    the installation process.

    A>copy b:harddisk.sys a:/v

        1 File(s) copied

    A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

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    CUSTOMIZATION COMPLETED.

    A>copy b:config.sys a:/v

        1 File(s) copied

    A>copy b:eradir.com a:/v

        1 File(s) copied

    A>rem

```
A>rem

A>rem   NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE

A>rem   .

A>rem

A>
```

m. Reboot the system with the newly modified PC DOS "working diskette" by pressing the Ctrl, Alt, and Del keys simultaneously.

> NOTE: You must initialize all the SYSGEN XL disk volume directories after these disk volumes are configured and installed. Perform the following steps.

n. Type in <u>ERADIR</u> <u>C:</u> as follows and press <CR>.

```
A><u>ERADIR</u> <u>C:</u> <CR>
```

o. The following question will display.

Erase all files on volume C: (Y/N)?

p. Type in <u>Y</u> and press <CR>. The system will display the following messages.

Directory being erased...
Directory cleared on volume C.

q. Type in <u>CHKDSK</u> <u>C:</u> at the A> prompt and the system will display the following message.

```
4898816 bytes total disk space
4898816 bytes available on disk
262144 bytes total memory (depending on your memory size)
233904 bytes free
```

r. Repeat steps n. through q. for the remaining disk volumes, D:, E: and F:, to initialize the volume directories.

You have finished configuring your SYSGEN XL subsystem with four hard disk volumes on your IBM PC. You should now copy the remaining SYSGEN XL support software utility programs to volume C: on the SYSGEN XL subsystem. To accomplish this the following procedure may be used.

a. Make sure the SYSGEN XL support software "working diskette" is in drive B:. If you have a single floppy disk drive system, the operating system will prompt you when to change diskettes.

b. Type in <u>COPY B:*.* C:/V</u> at the system prompt and press <CR> (carriage return).

c. The system will transfer all of the utility programs and files on the Support Software "working diskette" to volume C: on the SYSGEN XL subsystem.

The SYSGEN XL subsystem hard disk is now configured as volumes C:, D:, E: and F:. Each volume contains 4,898,816 bytes of available disk storage, space for up to 512 directory entries is available and the standard cluster size is 8 Kbytes. To subdivide the SYSGEN XL subsystem hard disk into more than four volumes, the preceding procedure can be used as a guide. We suggest that for ease of use you always configure your disk volumes the same size and that you always subdivide the hard disk into an even number of volumes. If you wish to change the maximum number of directory entries available or the cluster size refer to the specific procedures for this described in paragraph 5.3.7.

```
***********
* CAUTION *
***********
```

You may only restore a Volume Image backup (using PRESERVE.EXE) to another volume if the characteristics of the two volumes are identical, i.., same size clusters and same number of directory entries.

5.3.4   FACTORY STANDARD CONFIGURATION INSTALLATION ON YOUR XT OR AT

The following procedure installs your SYSGEN XL subsystem in the factory standard configuration (one 20 Megabyte volume D:) on an IBM XT or AT with a single floppy disk. This procedure assumes that you normally boot your IBM XT or AT from internal hard disk C:.

a.   Boot the system from the IBM internal hard disk C: by pressing the "Ctrl", "Alt" and "Del" keys simultaneously with the floppy disk drive A: door open.

> NOTE: <CR> = carriage return
>   [ ] = default values
>   **Boldface** = system prompts
>   <u>Underlined</u> = operator responses

b.   Type in <u>ASSIGN A=C</u> as follows and press the "carriage return".

    C><u>ASSIGN A=C</u> <CR>

c.   Insert the SYSGEN XL Support Software "working diskette" created in paragraph 5.2 into the floppy disk drive.

The CONFIG.EXE utility program is used to define the SYSGEN XL hard disk configuration. This configuration step prepares the hardware characteristics data for use in the subsequent installation. It also gives the user the option of dividing the hard disk into volumes in his own way, rather than using the factory standard configuration. If you respond with <CR> (carriage return) to the questions that are presented on the screen when the program is running, you will implement the factory standard configutation (the default values).

d.   Type in <u>B:CONFIG/XL</u> at the system prompt as follows and press the carriage return.

    C><u>B:CONFIG/XL</u> <CR>

e.   The system will respond with the following:

    VOLUMES C configured: 76930 blocks (19232.5 K bytes) each.

    C>

f.   Type in <u>B:CONFIG</u> at the system prompt as follows and press the carriage return.

    C><u>B:CONFIG</u> <CR>

g.   The system will prompt you to insert diskettes with the following message. (Remember that the SYSGEN XL support software diskette is always the diskette for drive B:.)

Insert the diskette for drive B: and strike
        any key when ready

h.   Press any key to continue and the following message will display:

      CONFIG V 2.10A -- SYSGEN XL Subsystem Configuration Program
      Copyright (c) 1983 Sysgen, Inc.

      Do you want to use standard factory configuration? [Y]

i.   Type in Y and press <CR> (carriage return).

                    NOTE: The SYSGEN XL utility CONFIG.EXE
                    does not recognize the IBM XT or AT
                    internal hard disk drive(s). This utility
                    is only used to configure the SYSGEN XL
                    hard disk and recognizes the SYSGEN XL
                    volumes as logical disk 1, 2, etc.,
                    depending on the number of disk volumes
                    you configure. When you reboot the system
                    later in this procedure the device driver
                    will use the next sequential volume
                    designator, D: or E:, or etc., depending
                    on the number of internal hard disk
                    volumes in your IBM XT or AT.

j.   The system will respond with the following message.

      Volume(s) C configured: 76930 blocks (19232.5 K blocks).

                    NOTE: Each time CONFIG.EXE is run to
                    define the hard disk configuration,
                    INSTALL must be run, as described in the
                    following paragraphs, to install the disk
                    parameters and produce a modified PC DOS
                    "working diskette" for use with the
                    SYSGEN XL subsystem.

k.   Type in B:INSTALL as follows and press <CR>. Remember that the
      SYSGEN XL Support Software "working diskette" is disk B:.

      C>B:INSTALL <CR>

l.   The system will display the following series of messages during
      the installation process.

      A>copy b:harddisk.sys a:/v

            1 File(s) copied

```
A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

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CUSTOMIZATION COMPLETED.

A>copy b:config.sys a:/v

        1 File(s) copied

A>copy b:eradir.com a:/v

        1 File(s) copied

A>rem

A>rem

A>rem  NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE
```

> NOTE: <u>DISREGARD THE PRECEDING MESSAGE.</u>
> This message DOES NOT APPLY when
> configuring the system to boot from the
> internal hard disk C:.

```
A>rem

A>rem

C>
```

m. Type in <u>ASSIGN</u> as follows and press the "carriage return".

    `C>`<u>`ASSIGN`</u>` <CR>`

n. Perform the following procedure, using the PC DOS editor
    EDLIN.COM, to modify the "CONFIG.SYS" file that was copied to the
    IBM internal hard disk C: so that the system will boot from C:.

o. Type in <u>EDLIN CONFIG.SYS</u> as follows, press the "carriage return",
    and perform the following procedure.

    ```
    C>EDLIN CONFIG.SYS <CR>
    End of input file
    *2D <CR>
    *E <CR>
    C>
    ```

p. Now reboot the system by first opening the door on the floppy disk
    A:, then pressing the "Ctrl", "Alt" and "Del" keys simultaneously.
    The system should boot from the IBM internal hard disk C:.

NOTE: The following procedure assumes a standard IBM XT or AT with the IBM hard disk containing only one volume (C:). The floppy disk will always be drives A: and B:. If you have more than one hard disk volume installed on your IBM XT or AT, for example, C: and D:, the first SYSGEN XL Subsystem hard disk volume would be the next sequential volume, i.e., volume E:. Perform the following steps.

****
* CAUTION *
****

Be very careful that the volume directories erased in the following steps are only for those volumes contained on the XL Subsystem hard disk. Running the program ERADIR.COM on ANY volume will erase all files contained in that disk volume. (If a volume on the IBM XT or AT is accidently erased with ERADIR.COM, you MUST run FORMAT.COM on it before the volume can be used again.)

q. Type in ERADIR D: as follows and press <CR>.

    C>ERADIR D: <CR>

r. The following question will display.

    Erase all files on volume D: (Y/N)?

s. Type in Y and press <CR>. The system will display the following messages.

    Directory being erased...
    Directory cleared on volume D.

t. Type in CHKDSK D: at the C> prompt and press <CR>. The system will display the following message.

    19660800 bytes total disk space
    19660800 bytes available on disk
    262144 bytes total memory (depending on your memory size)
    234192 bytes free

You have now finished configuring the SYSGEN XL subsystem on your IBM XT or AT in the factory standard configuration (one 20 Megabyte volume D:). The system will boot from the IBM internal hard disk C:. You

should now copy the remaining SYSGEN XL support software utility programs to SYSGEN XL volume D:. To accomplish this the following procedure may be used.

a. Insert the SYSGEN XL support software "working diskette" is in the floppy disk drive.

b. Type in <u>COPY A:*.* D:/V</u> at the system prompt and press <CR> (carriage return).

c. The system will transfer all of the utility programs and files on the Support Software "working diskette" to volume D: on the SYSGEN XL subsystem.

Your SYSGEN XL subsystem hard disk is now configured as volume D: with 19,660,800 bytes of disk storage available, space for up to 512 directory entries is available and the standard cluster size is 8 Kbytes. If you wish to subdivide your SYSGEN XL subsystem hard disk into more than one volume, refer to Table 5-1 to determine the paragraph number of the specific procedure that describes the configuration you desire. If you wish to modify the maximum number of directory entries available or the cluster size refer to paragraph 5.3.7 in this section.

```
***********
* CAUTION *
***********
```

You may only restore a Volume Image backup (using PRESERVE.EXE) to another volume if the characteristics of the two volumes are identical, i.e., same size clusters and same number of directory entries.

5.3.5   INSTALLING THE XL WITH TWO VOLUMES ON YOUR XT OR AT

The following procedure installs your SYSGEN XL subsystem hard disk as two volumes of equal size on an IBM XT or AT with a single floppy disk. This procedure assumes that you normally boot your IBM XT or AT from internal hard disk C:.

a. Boot the system from the IBM internal hard disk C: by pressing the "Ctrl", "Alt" and "Del" keys simultaneously with the floppy disk drive A: door open.

> NOTE: <CR> = carriage return
> [ ] = default values
> Boldface = system prompts
> Underlined = operator responses

b. Type in ASSIGN A=C as follows and press the "carriage return".

C>ASSIGN A=C <CR>

c. Insert the SYSGEN XL Support Software "working diskette" created in paragraph 5.2 into the floppy disk drive.

d. Type in B:CONFIG/XL at the system prompt as follows and press the carriage return.

C>B:CONFIG/XL <CR>

e. The system will prompt you to change diskettes.

Insert the diskette for drive B: and strike
any key when ready

f. Press any key to continue and the following message will display:

Volume(s) C configured: 76930 blocks (19232.5 K bytes).

g. Type in B:CONFIG at the system prompt as follows and press the carriage return.

C>B:CONFIG <CR>

h. The system will respond with the following messages:

CONFIG V 2.10A -- SYSGEN XL Subsystem Configuration Program
Copyright (c) 1983 Sysgen, Inc.

Do you want to use standard factory configuration? [Y]

i. Type in n and press <CR> (carriage return).

j. The system will respond with the following messages and questions. The values shown as defaults (between the brackets []) in the following questions are the actual values for the standard XL subsystem, without an additional hard disk drive. These values should appear as defaults. Verify that the default values are correct, otherwise type in the correct values before pressing <CR>. Perform the following sequence, entering the indicated values when prompted.

> NOTE: To determine the number to be entered in response to the "Logical Disk Size?" question in the following procedure, delete volume D: as shown, then take the number of blocks listed as "Number of Blocks Available =" and divide that number by the number of disk volumes you wish to configure. For example, the number of blocks available listed in the following example is 76,930 and the number of volumes being configured is 2. This indicates that the number of logical blocks per volume would be equal to 38,465. Enter this result as the "Logical Disk Size?" in the following procedure. The total number of blocks available for partitioning can also be determined from the message output that appears when "CONFIG/XL" is run at the beginning of this procedure. Refer to Table 5-2 for additional configuration data information.

Please input physical disk characteristics as follows.

```
Last Cylinder Number? [611] <CR>
Last Head Number?       [3] <CR>
Last Sector Number?    [31] <CR>
Drive Constant?         [1] <CR>
Disk Flag?              [0] <CR>

              For Tape Unit:
Tape drive type code?  [8] <CR>

    0 - Exit Program
    1 - Change Logical Disk Size
    2 - Change Volume to Logical Disk Assignment

Select Operation (0 -- 2)?  2 <CR>
```

VOLUME ASSIGNMENTS:

```
        Vol         Type         Number
        A:      Floppy            0
        B:      Floppy            1
        C:      Hard Disk         1
```

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? c <CR>
Change Volume to Floppy, Hard-disk, or Unused? u <CR>

VOLUME ASSIGNMENTS:

```
        Vol         Type         Number
        A:      Floppy            0
        B:      Floppy            1
```

Do you want to change assignments?   y <CR>
Change Which Volume (A - P)? d <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>
Logical Disk Number (1 - 16)? [1] <CR>

VOLUME ASSIGNMENTS:

```
        Vol         Type         Number
        A:      Floppy            0
        B:      Floppy            1
        D:      Hard Disk         1
```

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? e <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>
Logical Disk Number (1 - 16)? [1] 2 <CR>

VOLUME ASSIGNMENTS:

```
        Vol         Type         Number
        A:      Floppy            0
        B:      Floppy            1
        D:      Hard Disk         1
        E:      Hard Disk         2
```

Do you want to change assignments? n <CR>

k. The system will display the following menu.

            0 - Exit Program
            1 - Change Logical Disk Size
            2 - Change Volume to Logical Disk Assignment

    Select Operation (0 -- 2)? 1 <CR>

```
LOGICAL DISK SIZE ALLOCATION

Disk Num      Vol      Address      Num of Blocks
    1          D:         766           76930         ( 19232.5 K bytes)
Number of Blocks Available = 0

Add, Delete, or No-change?  d <CR>
Logical Disk Number (1 - 16)? [1] <CR>

LOGICAL DISK SIZE ALLOCATION

Disk Num      Vol      Address      Num of Blocks
Number of Blocks Available = 76930

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 1 <CR>
Logical Disk Size? 38465 <CR>              (Max # Blocks ÷ # Volumes)

LOGICAL DISK SIZE ALLOCATION

Disk Num      Vol      Address      Num of Blocks
    1          D:         766           38465         ( 9616.25K bytes)
Number of Blocks Available = 38465

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 2 <CR>
Logical Disk Size? 38465 <CR>              (Max # Blocks ÷ # Volumes)

LOGICAL DISK SIZE ALLOCATION

Disk Num      Vol      Address      Num of Blocks
    1          D:         766           38465         ( 9616.25K bytes)
    2          E:       39231           38465         ( 9616.25K bytes)
Number of Blocks Available = 0

Add, Delete, or No-change?  n <CR>
```

1. The system will display the following menu.

```
        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment

Select Operation (0 - 2)?  0 <CR>

C>
```

NOTE: Each time CONFIG.EXE is run to
define the hard disk configuration,
INSTALL must be run, as described in the
following paragraphs, to install the disk
parameters and produce a modified PC DOS
"working diskette" for use with the
SYSGEN XL subsystem.

m. Type in B:INSTALL as follows and press <CR>. On a single floppy
    disk unit system the operating system will prompt the user to
    change diskettes several times. Remember that the PC DOS "working
    diskette" is A: and the XL Support Software "working diskette" is
    B:.

    C>B:INSTALL <CR>

n. The system will display the following series of messages during
    the installation process.

    A>copy b:harddisk.sys a:/v

        1 File(s) copied

    A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

    SCINSTAL v 2.1 -- DEVICE DRIVER CUSTOMIZATION FOR SYSGEN I/O SUBSYSTEM

    CUSTOMIZATION COMPLETED.

    A>copy b:config.sys a:/v

        1 File(s) copied

    A>copy b:eradir.com a:/v

        1 File(s) copied

    A>rem

    A>rem

    A>rem NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE

                NOTE: DISREGARD THE PRECEDING MESSAGE.
                This message DOES NOT APPLY when
                configuring the system to boot from the
                internal hard disk C:.

    A>rem

    A>rem

C>

o. Type in ASSIGN as follows and press the "carriage return".

    C>ASSIGN <CR>

p. Perform the following procedure, using the PC DOS editor
    EDLIN.COM, to modify the "CONFIG.SYS" file that was copied to the
    IBM internal hard disk C: so that the system will boot from C:.

q. Type in EDLIN CONFIG.SYS as follows, press the "carriage return",
    and perform the following procedure.

    C>EDLIN CONFIG.SYS <CR>
    End of input file
    *2D <CR>
    *E <CR>
    C>

r. Now reboot the system by first opening the door on the floppy disk
    A:, then pressing the "Ctrl", "Alt" and "Del" keys simultaneously.
    The system should boot from the IBM internal hard disk C:.

                    NOTE: The following procedure assumes a
                    standard IBM XT or AT with the IBM hard
                    disk containing only one volume (C:).
                    The floppy disk will always be drives A:
                    and B:. If you have more than one hard
                    disk volume installed on your IBM XT or
                    AT, for example, C: and D:, the first
                    SYSGEN XL Subsystem hard disk volume
                    would be the next sequential volume,
                    i.e., volume E:. Perform the following
                    steps.

                        ****
                        * CAUTION *
                        ****

                    Be very careful that the volume
                    directories erased in the following steps
                    are only for those volumes contained on
                    the XL Subsystem hard disk. Running the
                    program ERADIR.COM on ANY volume will
                    erase all files contained in that disk
                    volume. (If a volume on the IBM XT or AT
                    is accidently erased with ERADIR.COM, you
                    MUST run FORMAT.COM on it before the
                    volume can be used again.)

s. Type in ERADIR D: as follows and press <CR>.

C>ERADIR D: <CR>

t. The following question will display.

    Erase all files on volume D: (Y/N)?
u. Type in Y and press <CR>. The system will display the following
    messages.

    Directory being erased...
    Directory cleared on volume D.

v. Type in CHKDSK D: at the C> prompt and press <CR>. The system will
    display the following message.

    9822208 bytes total disk space
    9822208 bytes available on disk
    262144 bytes total memory (depending on your memory size)
    234096 bytes free

w. Repeat steps s. through v. for disk volume E: to initialize the
    volume E: directory.

You have now finished configuring the SYSGEN XL subsystem on your IBM
XT or AT for two volumes. The system will boot from the IBM internal
hard disk C:. You should now copy the remaining SYSGEN XL support
software utility programs to SYSGEN XL volume D:. To accomplish this
the following procedure may be used.

a. Insert the SYSGEN XL support software "working diskette" is in the
    floppy disk drive.

b. Type in COPY A:*.* D:/V at the system prompt and press <CR>
    (carriage return).

c. The system will transfer all of the utility programs and files on
    the Support Software "working diskette" to volume D: on the SYSGEN
    XL subsystem.

The SYSGEN XL subsystem hard disk is now configured as volume C: and
volume D:. Each volume contains 8,822,208 bytes of available disk
storage, space for up to 512 directory entries is available and the
standard cluster size is 8 Kbytes. If you wish to subdivide your
SYSGEN XL subsystem hard disk into more than one volume, refer to
Table 5-1 to determine the paragraph number of the specific procedure
that describes the configuration you desire. If you wish to modify
the maximum number of directory entries available or the cluster size
refer to paragraph 5.3.7 in this section.

```
          ***********
          * CAUTION *
          ***********
```

You may only restore a Volume Image
backup (using PRESERVE.EXE) to another
volume if the characteristics of the two
volumes are identical, i.e., same size
clusters and same number of directory
entries.

5.3.6   INSTALLING THE XL WITH FOUR VOLUMES ON YOUR XT OR AT

The following procedure installs your SYSGEN XL subsystem as four
volumes of equal size on an IBM XT or AT with a single floppy disk.
This procedure assumes that you normally boot your IBM XT or AT from
internal hard disk C:.

a. Boot the system from the IBM internal hard disk C: by pressing the
    "Ctrl", "Alt" and "Del" keys simultaneously with the floppy disk
    drive A: door open.

                   NOTE: <CR> = carriage return
                         [ ] = default values
                         Boldface = system prompts
                         Underlined = operator responses

b. Type in ASSIGN A=C as follows and press the "carriage return".

    C>ASSIGN A=C <CR>

c. Insert the SYSGEN XL Support Software "working diskette" created
    in paragraph 5.2 into the floppy disk drive.

d. Type in B:CONFIG/XL at the system prompt as follows and press the
    carriage return.

    C>B:CONFIG/XL <CR>

e. The system will prompt you to change diskettes.

    Insert the diskette for drive B: and strike
    any key when ready

f. Press any key to continue and the following message will display:

    Volume(s) C configured: 76930 blocks (19232.5 K bytes).

g. Type in B:CONFIG at the system prompt as follows and press the
    carriage return.

    C>B:CONFIG <CR>

h. The system will respond with the following message.

    CONFIG V 2.10A -- SYSGEN XL Subsystem Configuration Program
    Copyright (c) 1983 Sysgen, Inc.

    Do you want to use standard factory configuration? [Y]

i. Type in n and press <CR> (carriage return).

j. The system will respond with the following messages and questions. The values shown as defaults (between the brackets [ ]) in the following questions are the actual values for the standard XL subsystem, without the Disk Expansion unit. These values should appear as defaults. Verify that the default values are correct, otherwise type in the correct values before pressing <CR>. Perform the following sequence, entering the indicated values when prompted.

> NOTE: To determine the number to be entered in response to the "Logical Disk Size?" question in the following procedure, delete volume D: as shown, then take the number of blocks listed as "Number of Blocks Available =" and divide that number by the number of disk volumes you wish to configure. For example, the number of blocks available listed in the following example is 76,930 and the number of volumes being configured is 4. This indicates that the number of logical blocks per volume would be equal to 19,232. Enter this result as the "Logical Disk Size?" in the following procedure. The total number of blocks available for partitioning can also be determined from the message output that appears when "CONFIG/XL" is run at the beginning of this procedure. Refer to Table 5-2 for additional configuration data information.

Please input physical disk characteristics as follows.

```
Last Cylinder Number?  [611]  <CR>
Last Head Number?       [3]   <CR>
Last Sector Number?    [31]   <CR>
Drive Constant?         [1]   <CR>
Disk Flag?              [0]   <CR>

            For Tape Unit:
Tape drive type code?  [8]  <CR>

    0 - Exit Program
    1 - Change Logical Disk Size
    2 - Change Volume to Logical Disk Assignment

Select Operation (0 -- 2)?  2  <CR>
```

VOLUME ASSIGNMENTS:

        Vol   Type   Number
        A: Floppy   0
        B: Floppy   1
        C: Hard Disk   1

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? c <CR>
Change Volume to Floppy, Hard-disk, or Unused? u <CR>

VOLUME ASSIGNMENTS:

        Vol   Type   Number
        A: Floppy   0
        B: Floppy   1

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? d <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>

VOLUME ASSIGNMENTS:

        Vol   Type   Number
        A: Floppy   0
        B: Floppy   1
        D: Hard Disk   1

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? e <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>

VOLUME ASSIGNMENTS:

        Vol   Type   Number
        A: Floppy   0
        B: Floppy   1
        D: Hard Disk   1
        E: Hard Disk   2

Do you want to change assignments? y <CR>
Change Which Volume (A - P)? f <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>

VOLUME ASSIGNMENTS:

        Vol   Type   Number
        A: Floppy   0
        B: Floppy   1
        D: Hard Disk   1
        E: Hard Disk   2
        F: Hard Disk   3

Do you want to change assignments? y <CR>

Change Which Volume (A - P)? g <CR>
Change Volume to Floppy, Hard-disk, or Unused? h <CR>

VOLUME ASSIGNMENTS:

Vol	Type	Number
A:	Floppy	0
B:	Floppy	1
D:	Hard Disk	1
E:	Hard Disk	2
F:	Hard Disk	3
G:	Hard Disk	4

Do you want to change assignments? n <CR>

k. The system will display the following menu.

        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment

Select Operation (0 -- 2)? 1 <CR>

LOGICAL DISK SIZE ALLOCATION:

Disk Num	Vol	Address	Num of Blocks	
1	D:	766	76930	(19232.5 K bytes)

Number of Blocks Available = 0

Add, Delete, or No-change? d <CR>
Logical Disk Number (1 - 16)? [1] <CR>

LOGICAL DISK SIZE ALLOCATION:

Disk Num   Vol   Address   Num of Blocks
Number of Blocks Available = 76930

Add, Delete, or No-change? a <CR>
Logical Disk Number (1 - 16)? [1] <CR>
Logical Disk Size? 19232 <CR>   (Max # Blocks + # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num	Vol	Address	Num of Blocks	
1	D:	766	19232	(4808 K bytes)

Number of Blocks Available = 57698

Add, Delete, or No-change? a <CR>
Logical Disk Number (1 - 16)? [1] 2 <CR>
Logical Disk Size? 19232 <CR>   (Max # Blocks + # Volumes)

```
LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
     1         D:          766         19232         (   4808    K bytes)
     2         E:        19998         19232         (   4808    K bytes)
Number of Blocks Available = 38466

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 3 <CR>
Logical Disk Size? 19072 <CR>                  (Max # Blocks ÷ # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
     1         D:          766         19232         (   4808    K bytes)
     2         E:        19998         19232         (   4808    K bytes)
     3         F:        39230         19232         (   4808    K bytes)
Number of Blocks Available = 19234

Add, Delete, or No-change?  a <CR>
Logical Disk Number (1 - 16)? [1] 4 <CR>
Logical Disk Size? 19072 <CR>                  (Max # Blocks ÷ # Volumes)

LOGICAL DISK SIZE ALLOCATION:

Disk Num      Vol      Address      Num of Blocks
     1         D:          766         19232         (   4808    K bytes)
     2         E:        19998         19232         (   4808    K bytes)
     3         F:        39230         19232         (   4808    K bytes)
     4         G:        58462         19232         (   4808    K bytes)
Number of Blocks Available = 2

Add, Delete, or No-change?  n <CR>
```

1. The system will display the following menu.

        0 - Exit Program
        1 - Change Logical Disk Size
        2 - Change Volume to Logical Disk Assignment

    Select Operation (0 - 2)? 0 <CR>

    C>

> NOTE: Each time CONFIG.EXE is run to
> define the hard disk configuration,
> INSTALL must be run, as described in the
> following paragraphs, to install the disk
> parameters and produce a modified PC DOS
> "working diskette" for use with the
> SYSGEN XL subsystem.

m. Type in B:INSTALL as follows and press <CR>.

   C>B:INSTALL <CR>

n. The system will display the following series of messages during the installation process.

   A>copy b:harddisk.sys a:/v

        1 File(s) copied

   A>b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

   SCINSTAL v 2.1 -- DEVICE DRIVER CUSTOMIZATION FOR SYSGEN I/O SUBSYSTEM

   CUSTOMIZATION COMPLETED.

   A>copy b:config.sys a:/v

        1 File(s) copied

   A>copy b:eradir.com a:/v

        1 File(s) copied

   A>rem

   A>rem

   A>rem NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE

             NOTE: DISREGARD THE PRECEDING MESSAGE.
             This message DOES NOT APPLY when
             configuring the system to boot from the
             internal hard disk C:.

   A>rem

   A>rem

   C>

o. Type in ASSIGN as follows and press the "carriage return".

   C>ASSIGN <CR>

p. Perform the following procedure, using the PC DOS editor EDLIN.COM, to modify the "CONFIG.SYS" file that was copied to the IBM internal hard disk C: so that the system will boot from C:.

q. Type in EDLIN CONFIG.SYS as follows, press the "carriage return", and perform the following procedure.

5-40

```
C>EDLIN CONFIG.SYS <CR>
End of input file
*2D <CR>
*E <CR>
C>
```

r. Now reboot the system by first opening the door on the floppy disk
    A:, then pressing the "Ctrl", "Alt" and "Del" keys simultaneously.
    The system should boot from the IBM internal hard disk C:.

> NOTE: The following procedure assumes a
> standard IBM XT or AT with the IBM hard
> disk containing only one volume (C:).
> The floppy disk will always be drives A:
> and B:. If you have more than one hard
> disk volume installed on your IBM XT or
> AT, for example, C: and D:, the first
> SYSGEN XL Subsystem hard disk volume
> would be the next sequential volume,
> i.e., volume E:. Perform the following
> steps.

```
**********
* CAUTION *
**********
```

> Be very careful that the volume
> directories erased in the following steps
> are only for those volumes contained on
> the XL Subsystem hard disk. Running the
> program ERADIR.COM on ANY volume will
> erase all files contained in that disk
> volume. (If a volume on the IBM XT or AT
> is accidently erased with ERADIR.COM, you
> MUST run FORMAT.COM on it before the
> volume can be used again.)

s. Type in ERADIR D: as follows and press <CR>.

    C>ERADIR D: <CR>

t. The following question will display.

    Erase all files on volume D: (Y/N)?

u. Type in Y and press <CR>. The system will display the following
    messages.

    Directory being erased...
    Directory cleared on volume D.

v. Type in <u>CHKDSK D:</u> at the C> prompt and press <CR>. The system will display the following message.

    4898816 bytes total disk space
    4898816 bytes available on disk
    262144 bytes total memory (depending on your memory size)
    233904 bytes free

w. Repeat steps s. through v. for disk volume E:, F: and G: to initialize these disk volume directories.

You have now finished configuring the SYSGEN XL subsystem on your IBM XT or AT for four volumes. The system will boot from the IBM internal hard disk C:. You should now copy the remaining SYSGEN XL support software utility programs to SYSGEN XL volume D:. To accomplish this the following procedure may be used.

a. Insert the SYSGEN XL support software "working diskette" is in the floppy disk drive.

b. Type in <u>COPY A:*.* D:/V</u> at the system prompt and press <CR> (carriage return).

c. The system will transfer all of the utility programs and files on the Support Software "working diskette" to volume D: on the SYSGEN XL subsystem.

The SYSGEN XL subsystem hard disk is now configured as volume D:, E:, F: and G:. Each volume contains 4,898,816 bytes of available disk storage, space for up to 512 directory entries is available and the standard cluster size is 8 Kbytes. To subdivide the SYSGEN XL subsystem hard disk into more than four volumes, the preceding procedure can be used as a guide. We suggest that for ease of use you always configure your disk volumes the same size and that you always subdivide the hard disk into an even number of volumes. If you wish to change the maximum number of directory entries available or the cluster size refer to the procedures described in paragraph 5.3.7.

****
* CAUTION *
****

You may only restore a Volume Image backup (using PRESERVE.EXE) to another volume if the characteristics of the two volumes are identical, i.e., same size clusters and same number of directory entries.

5.3.7 ADJUSTING THE NUMBER OF DIRECTORY FILES AND CLUSTER SIZE IN A VOLUME

The factory standard configuration for the number of files for each hard disk volume is 512 and the standard cluster size is 8 Kbytes. To change this, you will need to edit the configuration line in the INSTALL.BAT file provided on the SYSGEN XL Subsystem Support Software diskette. This can be done by using the PC DOS editor EDLIN.COM. The following illustrates the default configuration line contained in the INSTALL.BAT file.

b:scinstal /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2E/E2E/F2E/G2E

The preceding .BAT file line is used to call the SCINSTAL.COM utility and provide directory and cluster size information on all sixteen possible logical disk drive volumes. The information fields for each drive volume are separated by "/".

The first character after the "/" indicates the SYSGEN XL hard disk logical volume number, from one to sixteen. <u>This character should never be changed or deleted.</u> Only the configuration information for the actual hard disk volumes you are installing is absolutely required, even though configuration information for all sixteen volumes is provided in the provided INSTALL.BAT file.

The single digit code following the volume number specifies the number of directory entries to allocate, as follows:

Digit Code	Number of Directory Entries
0	256
1	256
2	512
3	768
4	1024
5	1280
6	1536
7	1792
8	2048

> NOTE: The following information on cluster size does not pertain to PC DOS 3.0. In PC DOS 3.0 the number of bytes per cluster is a fixed function of the size of the hard disk.

The alpha code following the directory entries digit code specifies the number of bytes per cluster, as follows:

| | Cluster Size and Max Volume Size Allowable | |
Alpha Code	Bytes/Cluster	Mbytes/Volume
A	512	2
B	1024	4
C	2048	8
D	4096	16
E	8192	32

> NOTE: Changing the cluster size directly
> affects your maximum volume size. For
> example, if you configure one of the hard
> disk volumes as 8 Mbytes and your cluster
> size is only 1024 bytes/cluster, the PC
> DOS operating system will not check the
> boundary and the address wrap-around will
> wipe out data.

The following example procedure shows how to use the PC DOS editor
EDLIN.COM to change the number of directory entries and cluster size
designated in the INSTALL.BAT file. The following example assumes an
IBM PC with two floppy disk drives (i.e., floppy drive A: contains the
PC DOS "working diskette" and floppy drive B: contains the SYSGEN XL
Support Software "working diskette"). In the following example, only
four hard disk volumes are being installed on the SYSGEN XL,
therefore, only the configuration information for the first four
volumes is provided.

Ensure that EDLIN.COM is resident on the PC DOS "working diskette".
Change the default floppy drive to B: by typing B: at the A> prompt
and pressing <CR>. The following editing procedure changes the number
of directory entries to 1024 (digit code 4) and the cluster size to
512 bytes (Alpha code A) for logical disk volumes 1 through 4.

> NOTE: <CR> = carriage return
>   [ ] = default values
>   Boldface = system prompts
>   Underlined = operator responses

```
B>A:EDLIN INSTALL.BAT <CR>
End of input file
*L <CR>
    1:*copy b:harddisk.sys a:/v
    2: b:scinstall /12E/22E/32E/42E/52E/62E/72E/82E/92E/A2E/B2E/C2E/D2F/E2E/F2E/G2E
    3: copy b:config.sys a:/v
    4: copy b:eradir.com a:/v
    5: rem
    6: rem  NOW, REBOOT THE SYSTEM USING THE NEWLY INSTALLED DOS DISKETTE
    7: rem
    8: rem
```

```
*2D <CR>
*2I
    2:b:scinstall /14A/24A/34A/44A <CR>
    3:^Z <CR>
*E <CR>

B>
```

The modification to the INSTALL.BAT file is now complete and the file
is ready for use in configuring the SYSGEN XL subsystem hard disk.

SECTION 6

SYSGEN XL SUBSYSTEM UTILITY SOFTWARE

6.1   General

The SYSGEN XL support software diskette contains following the files:

> NOTE: If you have the Disk Expansion Unit
> an additional transit damage check file
> ($CDSK040.BAT) is included with your
> support software and the utilities
> CONFIG.EXE and $CPARK.EXE are replaced by
> the DOS command batch files CONFG040.BAT
> and $CPRK040.BAT, plus the programs
> called by the batch files. Refer to the
> end of this section for information on
> the Disk Expansion Unit utility software.

Name	Description
FILESAVE.EXE	Utility program that backs up and restores files on a file-by-file basis.
PRESERVE.EXE	Utility program that images volumes on a byte-by-byte basis.
SHOWERR.COM	Utility program to display the SYSGEN XL Device Error Diagnostic Code and Diagnostic Data on the CRT screen.
$CDSKTST.EXE	Maintenance program used to scan for any defective areas (in terms of tracks) on the SYSGEN XL hard disk. This program can also be used to format the SYSGEN XL hard disk by specifying the format option (executing $CDSKTST/F). $CDSKTST/F DESTROYS ALL EXISTING DATA RECORDED ON THE SYSGEN XL HARD DISK DRIVE.
$CPARK.EXE	Maintenance program to move disk read/write heads to the landing zone in preparation for reshipping the unit.

CONFIG.EXE	Utility program used to partition the disk into volumes of sizes of your choice.
INSTALL.BAT	DOS Command batch file used to add routines to your operating system software.
CONFIG.SYS	DOS custom configuration file which contains the additional device driver. In this particular file there is only one device driver, HARDDISK.SYS.
HARDDISK.SYS	This file is the hard disk device driver.
SCINSTAL.COM	Utility program that uses a command line to alter the device driver for the directory and cluster sizes in each logical drive on the system. It always makes the change to the copy of the device driver in A:.
ERADIR.COM	Utility program used to initialize the disk volume directories as part of the installation procedure. This utility should only be used on the SYSGEN XL hard disk volumes.

The files $CDSKTST.EXE, CONFIG.EXE, INSTALL.BAT, HARDDISK.SYS, CONFIG.SYS SCINSTAL.COM and ERADIR.COM are all used when configuring and installing the XL subsystem. With the exception of $CDSKTST.EXE, the operation of these utility programs and files is shown in the procedures contained in Section 5 and will not be repeated in this section. The utilities FILESAVE.EXE, PRESERVE.EXE, SHOWERR.COM and $CPARK.EXE are programs that may be used during the standard operation of your computer system. Explanations of the operation of these four utilities are contained in the following paragraphs. In addition, the operation of the $CDSKTST.EXE maintenance utility is described in this chapter.

6.1.1 FILESAVE.EXE

The FILESAVE utility program allows you to transfer one or a group of files from disk to tape or tape to disk. A maximum of 512 individual files may be transferred into each fileset at one time (when subdirectories are used, each subdirectory is considered a file). FILESAVE groups the files into a single fileset and assigns the fileset an identification number. Up to 64 separate filesets (numbered from 0 to 63) may be used in one tape.

Since the files you want to save may not be contiguous (located adjacent to one another on the disk), FILESAVE first moves each of them into a temporary space on disk. When they are all grouped together, it performs the transfer to tape of the entire fileset at once. This avoids causing the tape to go through multiple start/stop operations, which would slow the transfer and cause unnecessary wear on the cartridge tape drive.

The same temporary disk space is used when restoring from tape to disk using FILESAVE, since the disk may not have enough contiguous space to store all the files.

FILESAVE allows you to display the directories (catalogs) of any tape it has created. You can see exactly which filesets are on each cartridge, and which files make up each fileset.

6.1.2   PRESERVE.EXE

The PRESERVE utility program differs from FILESAVE in that it performs a bit-by-bit Image transfer of all recorded information in a selected disk volume (including directory, subdirectories, file allocation tables and even empty space between data blocks) to the streaming tape. There is no need to specify each file in that disk volume.

PRESERVE performs this transfer in a bit-by-bit "Image" of the selected disk volume. One Volume Image per disk is created. Data is transferred back to disk in the same configuration: no data manipulation is performed.

You will not be able to see which files have been transferred to tape by looking at a tape directory, as was possible with FILESAVE.

6.1.3   SHOWERR.COM

SHOWERR is used to display the Device Error, Diagnostic Code and Diagnostic information on the last error that occurred in the SYSGEN XL Subsystem. This program should be run immediately after you encounter a problem during normal operation. Note that the information presented by this program is valid only for the last error which occurred on the subsystem. Refer to Section 9 Maintenance for a list of Error Codes and Diagnostic Codes.

6.1.4 $CPARK.EXE

This utility moves the hard disk drive read/write heads to the landing zone to prepare the unit for movement or reshipment. You must run this program before shipping the unit to properly protect the disk drive.

6.1.5 $CDSKTST.EXE

$CDSKTST.EXE is a maintenance program that either scans the disk for
defective areas (in terms of tracks) without reformatting the disk, or
can completely reformat the disk and, then perform a scan for
defective areas.

When the utility is executed by typing in $CDSKTST and pressing the
carriage return, this program will scan the entire disk drive and
produce a summary of the defective tracks on the drive. It will scan
each track on the drive and report the track(s) that has been marked
bad as well as any new track that is found to be defective. You
should record any new tracks reported as bad. This information is
needed as answers to be input in response the $CDSKTST/F inquiries.

To completely reformat the entire disk, $CDSKTST/F is typed in
followed by a carriage return. The maintenance program will then
completely reformat disk and scan for defective areas.

                        ****
                        * CAUTION *
                        ****

            This reformatting operation will destroy
            all existing data recorded on the disk
            drive.

            NOTE: <CR> = carriage return
                  [ ] = default values
                  Boldface = system prompts
                  Underlined = operator responses

The following provides an example of the messages that will display
and the operator interaction that is necessary when $CDSKTST/F is run.

            SCDSKTST V 1.20 -- Hard Disk Maintenance Utility
            Copyright (c) 1983 Sysgen Inc.

Format operation will destroy all data on the disk drive.
Do you still want to proceed? [N] Y <CR>
How many bad tracks? [0] 2 <CR> \
Bad track 1: cylinder? 200 <CR> \   These responses are
             Head? 2 <CR>   >   obtained from the
Bad track 2: cylinder? 287 <CR> / $CDSKTST test.
             Head: 1 <CR>   /
Formatting in progress.
Formatting completed.
Cyl. 200 head 2 is alternated to cyl. 305 head 3
Cyl. 287 head 1 is alternated to cyl. 305 head 2
Checking cylinder x head y

Check track pass completed.
No problem detected on disk drive.

After running this program, the Volumes on the hard disk will remain inaccessible until the system is rebooted.

6.2   Operational Modes

Both FILESAVE and PRESERVE may be used in either of two operational
modes: Prompt Mode or Single Line Command Mode.   An overview of each
mode, with examples, will be presented in Sections 7 and 8. We
recommend that you walk through the Prompt Mode before using the
Single Line Command Mode, since explanations in the former are
presented in greater detail.

6.2.1   PROMPT MODE

The Prompt Mode allows the first-time user to walk through each step,
prompting for each parameter in turn.

6.2.2   SINGLE LINE COMMAND MODE

The Single Line Command Mode allows the user to enter all the command
parameters required to operate FILESAVE or PRESERVE in one single
entry.   These parameters will be discussed later; however, they
conform to IBM PC DOS single-line commands.

6.3   Operational Features of FILESAVE and PRESERVE

PRESERVE and FILESAVE both contain four operational features:

  BACKUP, RESTORE, CATALOG and QUIT.

6.3.1   BACKUP

This operational feature will allow you to backup your disk. Backup is for one-way transfers only: from disk to the SYSGEN XL cartridge tape drive. You may use either the Prompt Mode or the Single Line Command Mode.

6.3.2   RESTORE

This is the other one-way transfer: use it to restore your data back to disk from tape. Again, you may use either the Prompt Mode or the Single Line Command Mode.

6.3.3   CATALOG

This feature is similar to selecting a directory listing on a disk system.

FILESAVE:

  Using the catalog feature while running under FILESAVE will allow you to:

  - Scan the cartridge tape to see how many filesets you have recorded

  - Display the fileset labels only

  - Display the names of all files within:
    - a fileset
    - all filesets
    - all files from Fileset (X) to Fileset (Y) inclusive

  - Search for the existence of a particular file or a group of files on the tape

PRESERVE:

  Using the catalog feature while running under PRESERVE will allow you to display the Volume Image label only. Remember, the stored data is not written in an intelligent mode, but rather in a bit-by-bit Image on the disk. Only the Image ID label which was recorded by the SYSGEN XL software is written in an intelligible (therefore readable) form.

6.3.4   QUIT

This feature allows you to exit the SYSGEN XL utility program you are using; it performs minor housekeeping and returns you to the operating system.

FILESAVE:

Selecting the QUIT feature while operating under FILESAVE will:

- Rewind the tape to its beginning-of-tape position. This area of tape does not contain any recorded data; it is therefore safe to remove the cartridge from the drive.

- Return the software control to DOS.

> NOTE: Using the Single Line Command Mode will automatically cause the operation to finish with a QUIT function.

PRESERVE:

Selecting the QUIT feature while operating under PRESERVE will:

- Rewind the tape to its beginning-of-tape position.

- Return the software control to DOS.

USING THE SYSGEN UTILITY SOFTWARE - PROMPT MODE

7.1   FILESAVE.EXE/PRESERVE.EXE

This section will show you how to use the FILESAVE/PRESERVE program's in the prompt mode. Each time the system prompts you, several responses are possible. In this section we will discuss the various responses in detail. Then, after all prompts are discussed, the entire FILESAVE/PRESERVE sequence will be shown in summary form, as you will see it on the CRT screen.

7.1.1   LOADING FILESAVE

If you have copied the SYSGEN XL Support Software diskette onto your hard disk as described in the software installation procedure (Section 5), load FILESAVE by typing

        FILESAVE <CR> (<CR> = carriage return)

However, if you have not copied the SYSGEN XL Support Software diskette on to hard disk, you must insert the diskette in floppy drive A. Load FILESAVE by typing

        A:FILESAVE <CR> (<CR> = carriage return)

7.1.2   FILESAVE MENU

Your CRT screen will now display:

        FILESAVE   V2.10 -- File Backup/Restore Utility
        Copyright (c) 1983 Sysgen Inc.

        BACKUP,RESTORE,CATALOG, OR QUIT ?

Should you receive any other message, please refer to Section 9 for explanation.

7.1.3 BACKUP COMMANDS:

                    NOTE: <CR> = carriage return
                          [ ] = default values
                          Boldface = system prompts
                          Underlined = operator responses

NOTE: FILESAVE will normally exclude
files with no date stamp. To include
these files refer to the "Enter initial
date:" section in the following.

Backup, Restore, Catalog, or Quit?

Answer B for backup function.

Enter file names:

Specify the names of the files you wish to backup to tape. File names
specified in PC DOS, such as the following, are valid formats:

    .
    *.com
    sales.*
    \xyz\sales\account.*
    manuals.doc d:report.doc
    \abc\sales.ord

Enter one file name followed by a space, then the next, etc. until you
have specified all the names you want (*.* is used to mean all files).
End the string with a carriage return to signify that you are through.
When the prompt reappears, answer with a carriage return.

Enter initial date:

This is an additional qualifier to the specified file names. It is
used when you only want to include those files with Date Stamps on or
after this specified Initial Date. In those instances when you want
to include files without Date and Time Stamps, you must enter [0-00-
1980] for this entry. The default is [1-01-80] (shown in the example.)

Enter initial time:

This is an additional qualifier to the specified file names. It is
used when you only want to include those files with Time Stamps on or
after this specified Initial Time (on the initial date specified.)
Hours are specified by a number between 0 and 23. In those instances
when you want to include some files without Time Stamps, you then
must enter [00:00] for this entry. This is the default (shown in the
example.)

Enter final date:

This is an additional qualifier to the specified file names. It is
used when you only want to include those files with Date Stamps on or
before this specified Final Date. If you do not wish to specify a
Final Date, the system defaults to [12-31-2099] for this entry.

Enter final time:

This is an additional qualifier to the specified file names. It is used when you only want to include those files with Time Stamps on or before this specified Final Time, on the final date specified. When not specified, the system defaults to [23:59] as shown in the example.

Enter comment, if any:

You may use this field to remind yourself of the nature of this fileset, or to add any information that will be helpful when reading the catalog. The example shows the Comment Field being used to store the note: Collection of Document Files.

Include Subdirectory processing?

If you answer "YES" to this prompt, FILESAVE will include the specified files in the current directory and subdirectories "below" the current directory. If you answer "NO", the subdirectory processing will be omitted. Our example shows the default, and excludes subdirectory processing.

Backup only files marked as Modified?

There is a Modified Bit associated with each DOS file to indicate whether or not this file has been modified since the last backup (See IBM DOS Manual, Backup Command.) If you answer Y, FILESAVE will backup only those files that have been modified since the last backup. If you answer N, FILESAVE will backup all the specified files regardless of their Modified Bit conditions.

Delete existing data on tape?

If you choose N, FILESAVE will scan through the tape and find the end of the last fileset; it will then begin writing the new backup after that point. This option allows you to have more than one backup on a single tape. If you choose Y, FILESAVE will delete the old data on the tape and start writing Fileset 0. In our example we have chosen to delete the old data.

> NOTE: WHEN RUNNING A NEW TAPE THE FIRST
> TIME, THE ANSWER TO THIS PROMPT MUST BE
> "YES".

SUMMARY OF FILESAVE.EXE (BACKUP) IN PROMPT MODE

Backup, Restore, Catalog, or Quit? B <CR>

Enter file names: c:manuals.doc d:report.doc <CR>

Enter file names: <CR>

Enter initial date: [1-01-1980] <CR>

Enter initial time: [0:00] <CR>

Enter final date: [12-31-2099] <CR>

Enter final time: [23:59] <CR>

Enter comment, if any:

    <u>Collection of document files.</u> <CR>

Include Subdirectory processing? [N] <CR>

Backup only files as Modified? [N] <CR>

Delete existing data on tape? [N] Y<CR>

The screen will then display:

    Constructing Fileset Directory ...
    Deleting old data on tape.
    New Fileset ID is O.
    Backup in progress ...
    C:\MANUALS.DOC
    D:\REPORT.DOC
    2 files were backed up in fileset O.

    Backup, Restore, Catalog, or Quit? _

7.1.4   RESTORE COMMAND:

        NOTE: <CR> = carriage return
              [ ] = default values
              Boldface = system prompts
              <u>Underlined</u> = operator responses

        NOTE: FILESAVE will normally exclude
        files with no date stamp. To include
        these files refer to the "Enter initial
        date:" section in the following.

    Backup, Restore, Catalog, or Quit?

Answer <u>R</u> for restore function.

    Restore to which Volume?

Specify the disk volume to which files on the tape will be restored.
If you do not specify, they will be restored onto the current volume.

From which Fileset?

Specify the Fileset ID where the files to be restored can be found. In the example, Fileset 1 was specified.

Enter file names:

Specify the File Names you want restored to disk. File names specified in PC DOS, such as the following, are allowable formats:

        .
        *.com
        sales.*
        \xyz\sales\account.*
        \abc\sales.ord

When you have specified all the file names you want, enter a carriage return in response to the File Name prompt when it reappears, signifying the end of the entries. Our example shows the files "c:dos.com" and "c:dos.exe" as being transferred back to disk.

Enter initial date:

This is an additional qualifier to the specified file names. It is used when you only want to include those files with Date Stamps on or after this specified Initial Date. In those instances when you want to include some files without Date and Time Stamps, you must enter [0-00-1980] for this entry. The default is [1-01-1980]. the default. Our example shows an initial date of Feb. 2, 1982.

Enter initial time:

This is an additional qualifier to the specified file names. It is used when you only want to include those files with Time Stamps on or after this specified Initial Time, on the initial date specified. In those instances when you want to include some files without Time Stamps, you then must enter [00:00] for this entry. This is the default (shown in the example.)

Enter final date:

This is an additional qualifier to the specified file names. It is used when you only want to include those files with Date Stamps on or before this specified Final Date. If you do not wish to specify a Final Date, the system defaults to [12-31-2099] for this entry.

Enter final time:

This is an additional qualifier to the specified file names. It is used when you only want to include those files with Time Stamps on or before this specified Final Time. If you do not wish to specify a Final Time, the system defaults to [23:59] for this entry.

7-5

Include Subdirectory processing?

If you answer "YES" to this prompt, FILESAVE will include the specified files in the current directory and subdirectories "below" the current directory. If you answer "NO", the subdirectory processing will be omitted. Our example shows the default, and excludes subdirectory processing.

SUMMARY OF FILESAVE.EXE (RESTORE) IN PROMPT MODE

Backup, Restore, Catalog, or Quit? R <CR>

Restore to which Volume? [current volume] D <CR>

From which Fileset? [0] 1 <CR>

Enter file names: c:dos.com   c:dos.EXE <CR>

Enter file names: <CR>

Enter initial date: [1-01-1980] 2-02-1982 <CR>

Enter initial time: [12-31-2099]<CR>

Enter final date: [0:00]<CR>

Enter final time: [23:59]<CR>

Include Subdirectory processing? [N] <CR>

The screen will then display:

Rewinding tape.
Restoring from Fileset 1 to volume D ......
C:\DOS.COM
C:\DOS.EXE
2 file(s) restored on volume D.

Backup, Restore, Catalog, or Quit? _

7.1.5   CATALOG COMMAND:

NOTE: <CR> = carriage return
      [ ] = default values
      Boldface = system prompts
      Underlined = operator responses

Backup, Restore, Catalog, or Quit?

Answer C for catalog function.

Scan All Fileset ID?

If you choose Y, FILESAVE will scan through all filesets existing on the tape, starting from Fileset 0 through the last fileset before the blank tape area.

If you choose N, you will be prompted for the starting Fileset and the ending Fileset Numbers. The example shows a NO response to this prompt.

From Fileset ID?

If you answered NO to the previous question, you must tell the sub-system which Fileset to scan first. Here we ask for Fileset 5.

To Fileset ID?

Likewise, you must tell SYSGEN XL Subsystem at which file it should stop scanning. The example calls for scanning to stop at Fileset 6.

Display Fileset Labels Only?

If you choose Y, your catalog listing will show only Fileset Size, Date and Time information. If you choose N, the files within each Fileset will also be listed.

Display all files (*.*)?

If you choose Y, all files in each Fileset will be listed. If you choose N, FILESAVE will search and list only those files specified in the next prompt. This option is useful if you want to verify that certain files are on the tape.

Enter file names?

If you choose not to display all files, specify those to be displayed here. In the example, all *.COM files will be displayed.

> NOTE: When this option is used, a fileset will be omitted from the display if it does not contain any of the files specified.

SUMMARY OF FILESAVE.EXE (CATALOG) IN PROMPT MODE

Backup, Restore, Catalog, or Quit? C <CR>

Scan all fileset ID? [Y] N <CR>

From Fileset ID? [0] 5 <CR>

To Fileset ID? [5] 6 <CR>

Display Fileset Labels Only? [N] <CR>

Display all files (*.*)? [N] <CR>

Enter files names: *.COM <CR>

FILESET	COMMENT	SIZE	FILES	DATE	TIME
5	"Monday backup"	122 K	50	1-06-84	17:00

PATH C:\DP	NAME		SIZE	FLAG	DATE	TIME
	WS	COM	21376	0	10-15-83	15:05
	ASM	COM	41456	0	11-20-83	13:00

FILESET	COMMENT	SIZE	FILES	DATE	TIME
6	"Tuesday backup"	122 K	50	1-06-84	17:00

PATH C:\SALES	NAME		SIZE	FLAG	DATE	TIME
	BASIC	COM	11392	0	5-07-82	12:00
	CHKDSK	COM	1720	0	5-07-82	12:00

Backup, Restore, Catalog, or Quit? _

7.1.6   QUIT COMMAND

Backup, Restore, Catalog, or Quit?

Answer Q if you want to quit using FILESAVE. FILESAVE will rewind the tape to the beginning-of-tape position where none of the recording area of the tape is exposed, and return software control to DOS.

> NOTE: When using the Single Line Command Mode, this QUIT function is built-in and does not need to be requested.

7.2   PRESERVE (Loading/Menu)

Follow the instructions under Section 7.1.1 for loading PRESERVE, substituting "PRESERVE" for the name "FILESAVE."

Your CRT screen will now display:

    PRESERVE V 2.10 Disk Image Preservation Utility
    (c) Copyright 1983 Sysgen Inc.

7.2.1   BACKUP COMMAND

> NOTE: <CR> = carriage return
>   [ ] = default values
>   Boldface = system prompts
>   Underlined = operator responses

Backup, Restore, Catalog, or Quit?

Answer B for backup function.

Backup which volume(s)?

Specify the disk volume(s) to be backed up. More than one volume may be specified, separated by a space. In the example we have defaulted to the current volume.

Enter Comment, if any:

You may use this field to remind you of the nature of this volume IMAGE.

Delete existing data on tape?

If you choose N, PRESERVE will scan through the whole tape and find the end of the last volume IMAGE, and then begin the new backup after it. This option allows you to have more than one backup on a single tape. If you choose Y, PRESERVE will delete the old data on the tape and start writing volume IMAGE 0.

> NOTE: When running a new tape the first
> time, you must answer YES to this prompt.

SUMMARY OF PRESERVE.EXE (BACKUP) IN PROMPT MODE

Backup, Restore, Catalog, or Quit? B <CR>

Backup which volume(s)? [current volume] C <CR>

Enter Comment, if any:

routine weekly backup <CR>

Delete existing data on tape? [N] <CR>

The screen will then display:

    Rewinding tape
    Scanning for the end of tape
    New Image ID is 1

Volume C characteristics:

Sector size	= 512
Cluster size	= 4096
Directory entries	= 512
Total Clusters	= 2586

Backing up 3649K bytes on Volume C to Image 1.

Number of tape rewrites   =   5

Backup, Restore, Catalog, or Quit? _

If the number of tape rewrites reaches 15, it indicates the quality of your tape may be degrading. The normal range of this count is between 0 and 10. Refer to Section 9 for action required.

7.2.2   RESTORE COMMAND

NOTE: <CR> = carriage return
             [ ] = default values
             Boldface = system prompts
             Underlined = operator responses

Backup, Restore, Catalog, or Quit?

Answer R for restore function.

Enter Image ID?

Specify the IMAGE ID number from which data will be read in. The example calls for IMAGE ID 1, while the default is 0.

Restore to which Volume?

Specify the disk volume on which data will be restored. In the example, data will be restored to volume C.

SUMMARY OF PRESERVE.EXE (RESTORE) IN PROMPT MODE

Backup, Restore, Catalog, or Quit? R <CR>

Enter Image ID? [0] 1 <CR>

Restore to which Volume? C <CR>

The screen will then display:

```
        Rewinding tape
        Volume C characteristics:
                Sector size             = 512
                Cluster size            = 4096
                Directory entries       = 512
                Total Clusters          = 2586

        Restoring 3649K bytes from Image 1 to Volume C.
        Restore completed.

                Number of tape rereads =  0

        Backup, Restore, Catalog, or Quit?  _
```

If the number of tape rereads reaches 15, it indicates the quality of your tape may be degrading. The normal range of this count is between 0 and 10. Refer to Section 9 for action required.

7.2.3   CATALOG COMMAND

                    NOTE: <CR> = carriage return
                          [ ] = default values
                          Boldface = system prompts
                          Underlined = operator responses

        Backup, Restore, Catalog, or Quit?

Answer C for catalog function. Since the volume IMAGE is not a file oriented backup, a catalog function will not give the file breakdown of all the files in it.

        Scan All Image ID?

If you choose Y, all volume images existing in the tape will be scanned, starting from IMAGE 0 through the last IMAGE before the blank tape area. If you choose N, you will be prompted for the starting IMAGE ID Number and the ending IMAGE ID Number.

        From Image ID?

Answer with the first volume IMAGE ID number you want scanned. Our example starts with volume IMAGE 2.

        To Image ID?

Answer with the last volume IMAGE ID number to be scanned. The example shows volume IMAGE 3 as the ending number.

SUMMARY OF PRESERVE.EXE (CATALOG) IN PROMPT MODE

    Backup, Restore, Catalog, or Quit? C <CR>

    Scan ALL Image ID? [Y] N <CR>

    From Image ID? [0] 2 <CR>

    To Image ID? [2] 3 <CR>

The screen will then display:

Rewinding tape.

IMAGE ID	COMMENT	SIZE	VOLUME	DATE	TIME
2	"VOLUME C BACKUP"	3649 K	DOS C	2-1-84	17:00
3	"WEEKLY BACKUP"	9542 K	DOS C	2-10-84	18:03

    Backup, Restore, Catalog, or Quit? _

7.2.4   QUIT COMMAND

    Backup, Restore, Catalog, or Quit?

Answer Q if you want to quit using PRESERVE. PRESERVE will rewind the
tape to the beginning of tape position where none of the recording
area of the tape is exposed, and return software control to DOS.

SECTION 8

SYSGEN UTILITY SOFTWARE - SINGLE LINE COMMAND MODE

8.1   Overview

In addition to the Prompt Mode, the SYSGEN XL Subsystem utility programs FILESAVE.EXE and PRESERVE.EXE may also be operated in the Single Line Command Mode. In this mode of operation, the user can initiate the operation by inputting a single line of command on the PC. Single Line Command Mode may be preferable to Prompt Mode in the following situations:

1) More experienced users will probably want to bypass prompts;

2) Less experienced users can speed up the process while still entering the exact command string, thus avoiding interaction with the prompts;

3) Some users may want to incorporate the single line command into a batch file environment;

4) Some options are available only in the line command mode (e.g. /N in FILESAVE Backup and /P in FILESAVE Restore).

8.2   FILESAVE

8.2.1   FILESAVE BACKUP OPERATION

> NOTE: FILESAVE will normally exclude files with no date stamp. To include these files refer to the "Enter initial date:" section in paragraph 7.1.3.

Format: FILESAVE/B[ACKUP] [/DEL[ETE]] [/M] [/N] [/S] [filespec...]
           [/fromdate] [/fromtime] [/todate] [/totime] [/"comment"]

Functional Description:

/DEL -   Option to delete all previously recorded data on the tape before this backup; the new Fileset will become the first one (Fileset 0) on the tape.

NOTE: When running a new tape for the
first time, you must use the /DEL option.
If this option is not chosen, the
program will first scan the tape to
locate the end of last Fileset on the
tape and then append a new Fileset after
it.

/M -   Option to backup only those files with the Modification
            bit on. (Modification bit in the file directory will be
            set after the user modifies the file, and will be reset
            after the completion of a Backup function.)

/N -   Omit all hidden file and system files from backup.

/S -   Include all files in the current directory and sub-
            directories.

filespec - Only the files specified will be backed up.

/fromdate/fromtime -   Qualifiers to backup only those files with
/todate/totime   date-time within this range. If not specified,
                        the date-time range will be defaulted to those
                        shown in Section 7 under the Prompt mode. The
                        Date must contain a dash (-) and time must
                        contain a colon (:).

Example:

a) Delete old data on the tape (or when using a new cartridge).
    Backup all files both in the root and subdirectory of disk volume
    C and add the comment "backup all files".

        FILESAVE/B /DEL /S C:*.* /"backup all files"

b) Choose not to delete the old data, but allow FILESAVE to write
    this backup at the end of existing data on the tape. Backup those
    files under the pathname given which have been modified since the
    last backup.

        FILESAVE/B /M C:\ACCOUNT*.SAL

c) Back up two different files under two different pathnames in one
    single line command.

        FILESAVE/B C:\JOHN\MANUALS.DOC C:\DONALD\REPORT.DOC

8.2.2 FILESAVE RESTORE OPERATION

> NOTE: FILESAVE will normally exclude
> files with no date stamp. To include
> these files refer to the "Enter initial
> date:" section in paragraph 7.1.4.

Format: FILESAVE/R[ESTORE][/P][/fileset][filespec...][/fromdate]
[/fromtime][/todate][/totime] volume:

Functional Description:

/P -   Prompts user before overwriting any file on disk which
                 is either marked read-only or is of a later date than
                 the file on the tape.

/fileset -   Qualifier to process the fileset specified. Default is
                 Fileset 0.

filespec -   Qualifier to include the specified files in the fileset.

/fromdate/fromtime -   Qualifiers to include only those files within
/todate/totime   the range. The Date must contain dashes (-)
                       and the Time must contain a colon (:). If not
                       specified the date-time range will default as
                       described in Section 7.

volume letter: -   The disk volume on which the files will be
                       restored. This parameter is required in the
                       command line mode.

> NOTE: IMAGE.TMP is also created here. See
> Section 6.1.1 for a description of how it
> may affect your operation.

Example:

a) Restore all files in Fileset 0 onto disk volume C.

        FILESAVE/R /0 *.* C:

b) Restore files from Fileset 1, under the pathname and date/time
    given, onto disk volume D.

        FILESAVE/R /1 \ACCOUNT*.SAL /2-02-1982 /00:00
        /2-28-1982 /23:59 D:

c) Restore two different files under two different pathnames from Fileset 2 onto disk volume C.

       FILESAVE/R /2 \JOHN\MANUALS.DOC \DONALD\REPORT.DOC C:

8.2.3   FILESAVE CATALOG OPERATION

Format: FILESAVE/C[ATALOG] [/L] [/firstfileset] [/lastfileset]
         [filespec....]

Functional Description:

/L option -   This option will display the Fileset Label information only (no file breakdown will be given.)

first fileset -   The first fileset to be cataloged. If this entry is omitted, the program assumes all filesets on the tape.

lastfileset - The last fileset to be cataloged in this function. If this entry is omitted in single command mode, the program assumes the last fileset is the same as the first fileset and only this fileset is to be processed.

filespec -   Only the files specified will be displayed. If omitted, all files in those filesets will be displayed.

          NOTE: When this option is used, a fileset will be omitted from the display if it does not contain any of the files specified.

Examples:

a) To list all files of every fileset on the tape:

      FILESAVE/C

b) To list files named PAYROLL.ACC in filesets 5, 6 and 7:

      FILESAVE/C /5 /7 PAYROLL.ACC

c) To list filesets 1,2 and 3 but not to include individual files in each fileset.

      FILESAVE/C /1 /3 /L

8.3   PRESERVE

8.3.1   PRESERVE BACKUP OPERATION

Format: PRESERVE/B[ACKUP] [/DEL[ETE]] vol: [vol:] [/"comments"]

Functional Description:

Backup the indicated volume(s) onto the tape.

/DEL -   Option to delete all previously recorded data on the
                    tape before the backup; the new Volume Image will become
                    the first one on the tape.

                    NOTE: When running a new tape for the
                    first time, you must use the /DEL option.
                    If this option is not chosen, the program
                    will first scan the tape to locate the
                    end of the last Image on the tape and
                    then append a new Image after it.

volumeletter: -   The disk volume that is to be saved on tape.
                    Default is the current disk volume. If more than
                    one volume is be specified, multiple images will be
                    created.

                    NOTE: During the operation the program
                    displays the characteristics of the
                    volume being backed up. They include the
                    sector size, cluster size, directory size
                    and total clusters in the volume. For a
                    technical description of these character-
                    istics see Appendix C of the PC DOS 2.0
                    Manual.

Example:

a) Delete old data on the tape (or use a new cartridge.) Backup disk
    volume C: and add the comment "first backup."

        PRESERVE/B /DEL C: /"first backup"

b) Choose not to delete the old data; let PRESERVE locate the end of
    the existing data on tape. Then backup disk volume D. Add the
    comment "backup the second disk."

        PRESERVE/B D: /"backup the second disk"

8-5

8.3.2   PRESERVE RESTORE OPERATION

Format: PRESERVE/R[ESTORE] [/IMAGE ID] volumeletter:

Functional Description:

Restore the specified volume IMAGE from tape to the designated disk volume.

> NOTE: As is the case with the Backup command, this program also displays the characteristics of the volume to be restored. The program cannot be completed if the volume and the Volume Image have different characteristics.

Examples:

a) Restore from Volume IMAGE 0 to disk volume C.

    PRESERVE/R /0 C:

b) Restore from Volume IMAGE 1 to disk volume D.

    PRESERVE/R /1 D:

8.3.3   PRESERVE CATALOG OPERATION

Format: PRESERVE/C[ATALOG] [/from ID] [/to ID]

Functional Description:

Display label information of Images specified between [/from ID] and [/to ID].

Examples:

a) To list all Volume Images on the tape.

    PRESERVE/C

b) To list all Volume Images 5, 6 and 7:

    PRESERVE/C/5/7

c) To list Volume IMAGE 6

    PRESERVE/C/6

SECTION 9

MAINTENANCE

9.1   Preventive Maintenance

The amount of preventive maintenance required for satisfactory performance of the SYSGEN XL subsystem is extremely small. Except for cleaning the cartridge tape drive head and periodic inspection and cleaning of the air filter, no other parts of the subsystem should require preventive maintenance.

9.1.1   CARE OF THE TAPE DRIVE UNIT

The cartridge tape drive read/write head should be cleaned approximately once a month/100 hours. To clean the heads, remove the tape cartridge from the tape drive. Depending on the type of cartridge tape drive unit installed in your particular SYSGEN XL subsystem, this may be accomplished by one of the following two methods:

1. Press the cartridge in until it stops, then releasing it quickly. The cartridge latching mechanism will disengage, allowing the cartridge to eject partially so that it may be removed.

2. Slide the external sliding cartridge door latch to the left to disengage the latching mechanism. This allows the cartridge to eject partially so that it may be removed.

The read/write head is located on the left side of the cartridge access, approximately halfway back. It is mounted on an arm that swings back away from the tape cartridge when the cartridge locking mechanism is disengaged. The read/write head normally cannot be seen with the tape cartridge removed.

Depending on the type of cartridge tape drive unit installed in your particular SYSGEN XL subsystem, the read/write head can be moved back into a normal operating position for cleaning by one of the following methods:

1. For units without the sliding external sliding cartridge door latch, push the sliding base plate, located just inside the bottom lip of the cartridge access, in until it stops and then releasing the base plate to simulate tape cartridge loading. This will engage the cartridge locking mechanism causing the read/write head to swing out where it is accessible for cleaning.

2. For units with the sliding cartridge door latch, slid the door latch to the right, closed. This will engage the cartridge locking mechanism causing the read/write head to swing out where it is accessible for cleaning.

To clean the read/write head, soak a cotton swab with a long stem with isopropyl alcohol solution-98% (such as that used in floppy drive cleaning), and gently rub it against the head and tape guides. If new tape cartridges are being used, the cartridge tape drive head should be cleaned more often to avoid a buildup of wear products which may flake off the new tapes.

After the read/write head has been cleaned and is dry, disengage the cartridge locking mechanism on your unit by reversing the previous procedure. You may then reload a tape cartridge into the tape drive.

9.1.2 CARTRIDGE CARE AND LIFE EXPECTANCY

Always store the tape cartridges in a cool, dry place away from magnetic fields. Never Power-On or -Off the system while the cartridge is in the cartridge tape drive, as the tape could jam or your data on the tape could be damaged.

The cartridge can normally be used for at least 1000 passes, or a one-year period. However, if you observe that the number of rewrites during an PRESERVE Backup approaches 20, it indicates that you should change to a new cartridge or clean the tape read-write head as described in paragraph 9.1.1.

9.1.3 AIR FILTER

Check and clean the air filter at the back of your unit frequently to ensure good cooling air flow through the unit. Bad cooling air circulation can cause permanent damage to the unit.

9.2 Remedial Maintenance Procedures

9.2.1 UNEXPECTED BAD TRACK HANDLING

The hard disk has been specially formatted at the factory so that spare tracks, used only for this purpose, have been alternated for any bad tracks that occur due to defects on the disk. Therefore, you should never run into problems due to defects on the disk. However, due to transport, and in some other very rare circumstances, when you receive your XL Subsystem you may find the disk has defects in addition to those listed on the "Media Defect List" on the rear panel of your subsystem unit. If this happens, to avoid data losses and other operational problems, you must reformat your disk. YOU MUST MAKE SURE THAT ALL DATA STORED ON YOUR DISK HAVE BEEN BACKED UP PROPERLY BEFORE PROCEEDING. ALL DATA STORED ON THE DISK WILL BE DESTROYED DURING FORMATTING. If you do reformat your disk, add the information on the

additional defects to the "Media Defect List" for future reference. Reformatting is done by executing the utility program $CDSKTST/F. If you have a subsystem with the Disk Expansion Unit installed and the defects occur on the add-on hard disk, you will need to run the utility program $CDSK040/F, also. Operation of this program is described in Section 6.

9.2.2   OTHER PROBLEMS ENCOUNTERED DURING NORMAL OPERATION

If an unexpected error is encountered during normal operation, you can run the SHOWERR.COM utility program to display the Device Error and Diagnostic Information on your video screen. The Device Error tells you what kind of operational errors exist so that you can try to resolve some of the simple problems yourself. The Diagnostic Information consists of a Diagnostic Code and Diagnostic Data. The Diagnostic Code tells you the kind of internal errors the hardware has detected. A list of these codes follows. You are not expected to diagnose the hardware, but you can report problems to your dealer. Diagnostic Data is additional information for service personnel.

DEVICE ERROR (Hex)	DESCRIPTION
<01>	Access violation
<02>	Device write protected
<03>	Device not ready of cartridge not in
<04>	Device uninitialized or operation illegal after change of tape cartridge
<05>	Device Busy
<06>	Illegal device ID
<07>	Illegal device address
<08>	ECC error or excessive tape re-read/re-write
<09>	Tape file not found
<0A>	Disk seek error
<0B>	Device timeout error
<0C>	Transmission parity error
<0D>	Device full
<0E>	Illegal command parameter value
<0F>	Command failed
<10>	Undefined command
<11>	Cannot accept additional command
<12>	Device fault line asserted
<14>	Error in direct controller command

DIAGNOSTIC CODE (Hex)	DESCRIPTION
<00>	No error
<01>	No index pulse detected
<02>	No seek complete
<03>	Write fault

```
DIAGNOSTIC
    CODE
    (Hex)                     DESCRIPTION

  <04>          Drive not ready
  <05>          Drive not selected
  <06>          No track 00 detected during recalibration
  <07>          Multiple drives selected
  <08>          No sector pulse detected
  <09>          Alternate to a bad disk address
  <10>          ECC error in the ID field
  <11>          Uncorrectable data error in data field
  <14>          Record not found. Found correct cylinder and head but
                not sector
  <15>          Seek error. R/W head positioned on a wrong cylinder or
                wrong head selected
  <18>          Correctable data error in data field
  <19>          All sectors on the track are bad, no valid alternate
                track information found
  <1C>          Incorrect track format - incorrect cylinder address
  <1D>          Incorrect track format - incorrect head address
  <1E>          Incorrect track format - incorrect sector address
  <1F>          ECC error in data field during read ID operation
  <21>          Illegal disk address, beyond maximum address
  <23>          Drive type undefined
  <49>          File mark is not found in restore operation
  <4B>          Tape drive not ready
  <4C>          Timeout in tape read. Controller did not detect valid
                data in the tape read operations for more than 2 seconds
  <50>          controller operation error 0
  <51>          Controller operation error 1 or may also be caused by
                drive error or track not formatted in read/write
                operation
  <61>          Host bus parity error not posted in sense byte 0, just
                LEDs displayed and parity error bit set in completion
                status
```

9.2.3   ERROR MESSAGES REPORTED BY FILESAVE OR PRESERVE SOFTWARE

The following is a list of reported error messages and the actions
expected to be taken by the user.

     Tape cartridge write-protected
     -    Make sure that this is the cartridge you want to write   on.
     -    Position the write-protect selector to the non-write-protect
          (non-safe) position.
     -    Ensure the data cable between the SYSGEN QIC-FILE cartridge
          tape drive and the SYSGEN controller board is firmly seated.

Device not ready or tape cartridge not in
- Put a cartridge in the cartridge tape drive and try again.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.

Destination volume is not specified.
- Destination volume must be specified.

Excessive rereads or rewrites in tape operation
- The quality of your tape deteriorated or the heads are dirty. If in Backup, the backup is not complete. You must use another tape and repeat the entire operation. Always erase a new tape completly before using. If in Restore, try again.
- Clean the read-write head - see Section 9.1.1.

Tape cartridge is full
- The cartridge is full. Your last backup is not complete and should be repeated with a different cartridge.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.

Image ID/Fileset not found
- The specified IMAGE/Fileset cannot be located. Do a Catalog to list all Images/Filesets on the tape and try again.

Too many Filesets on this tape
- A maximum of 64 Filesets (0-63) are allowed on a cartridge. Your operation is attempting to exceed this limit. Use another cartridge.

For other errors, record the symptoms and sequence of events which led up to their occurrence, and report them to your dealer.

9.2.4   FILESAVE AND PRESERVE ERROR CODES

The following is a list of the Diagnostic Error Codes you may encounter. They are indications of hardware failures, either on the interface card or the tape drive.

<20> Illegal command received by the SYSGEN XL controller board.

        This error means the controller board received an illegal command from the software.

Possible causes and action:

-    There is a system problem. Run your system diagnostic to determine the failing unit.

<40> Excessive rewrites

This error means PRESERVE/FILESAVE has difficulty writing a block of data onto the tape. The code is followed by three bytes of diagnostic information indicating the number of bytes (in hexadecimal) that have been successfully saved at the time the error was detected.

Possible causes and action:

- The cartridge is of poor quality. Install another cartridge and try again.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- The read-write heads are dirty or contaminated
- If no cure is verified there may be a hardware problem. Contact your SYSGEN Inc. dealer.

<41> Tape is write-protected

Possible causes and action:

- Check the cartridge to make sure the write-protect selector is in the non-write-protect (non-safe) position.
- The write-protect sensor in the cartridge tape drive is malfunctioning.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.

<42> Cartridge is not in

Possible causes and action:

- Check the cartridge to make sure it is inserted correctly.
- The cartridge-in sensor in the cartridge tape drive is malfunctioning.
- The interface card is bad
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.

<43> Cartridge full

During a Backup operation, there is no more tape space available on the cartridge while there are more disk blocks to be saved. You will get this error again if you try to read the same tape in Restore or Catalog operations.

Possible causes and action:

- You tried to backup more data than the cartridge can hold. Ignore this backup and repeat the operation on another cartridge. Note that PRESERVE does not support a single backup on two tapes.
- If you feel you have enough tape space but still get this error, you may have a bad tape with a lot of rewrites: change cartridges and clean the heads.
- The cartridge tape drive is bad.
- The interface card is bad.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- Contaminated read-write heads may cause excessive read/writes, wasting tape space.

<44> Missing block or read error

This error means FILESAVE/PRESERVE has difficulty reading a block from the tape. The code is followed by three bytes of diagnostic information indicating the number of bytes (in hexadecimal) that have been successfully read at the time the error was detected. Possible causes and action:

- This is the first time you have used this cartridge and you have answered "N" for the "delete old data" prompt in the backup operation. You should have entered "Y" in order to purge invalid data on the tape that causes subsequent read problems.
- The cartridge used is of poor quality. Try to backup some files onto another cartridge and restore them to ensure that the hardware is working.
- The controller board is bad.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- The read-write heads are dirty or contaminated.

<45> Missing or unexpected BOT/EOT

The controller board has difficulty detecting the Beginning-of-Tape or End-of-Tape positions.

Possible causes and action:

- Tape problem: try another cartridge.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- Dirty BOT/EOT sensor. This sensor is located in the right tape guide. See paragraph 9.1.1.

<48> Hit File Mark

FILESAVE expects to read more data than that existing in the file.

Possible causes and action:

-   Use another cartridge and run the backup and restore again.
-   Cartridge tape drive is bad.
-   Controller board is bad.
-   Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.

<4A> Cartridge changed between backups

Possible cause and action:

-   You have changed or disturbed the cartridge in the cartridge tape. The software will reposition the tape before starting another backup.

<4C> No valid data detected from the tape during allotted time

Possible causes and action:

-   Tape problem; try another cartridge.
-   Try the cartridge on another cartridge tape drive.
-   Controller board is bad.
-   Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
-   Extremely contaminated read-write heads.

9.3   Returning the Product to SYSGEN Inc. Repair Facility

Should it become necessary to return your unit for repair, you can expedite the process by providing the dealer with the following:

-   The model and serial number of the unit
-   A copy of your invoice
-   The defective unit packaged in its original container
-   A record of the symptoms and problems you are having with the unit. If possible, enclose a hard copy of the error message.

Your dealer will then contact SYSGEN Inc. or its service facility to obtain an RMA (Return Material Authorization) number and return the unit.

9.4   Obtaining Technical Assistance

9.4.1   FROM YOUR DEALER

SYSGEN Inc. has a policy of providing quality technical assistance to its dealers and customers. You may contact your local dealer for assistance. Should your dealer be unable to help you, ask him to contact SYSGEN Inc. for further assistance.

GLOSSARY OF TERMS

ALLOCATION UNIT
: The unit of disk media (in bytes) which is used by DOS to calculate the availability and usage of disk space.

APPENDING
: The process of adding data onto the end of a file or filespace.

APPLICATION
: A series of interrelated programs and subroutines designed to perform a certain task. Examples are inventory control or graphics.

ARCHIVAL DATA
: Data which is stored offline for purposes of later retrieval, and which can be restored to duplicate a situation that occurred in the past (e.g. last year's monthly accounts receivable.)

BACKUP
: Data which is stored offline for purposes of later retrieval, usually in the event that data on the primary system becomes unreadable. In order that the present system may continue to function, the backup data should duplicate that currently on the system.

BIT
: A binary digit (i.e. a logical "1" or "0").

BOOT
: The process by which a programmed loader or operating system is installed in the CPU's main memory. Also known as IPL or Initial Program Loading.

BOT
: Beginning of Tape

BUFFER
: An area of storage (or memory) that temporarily holds data to be transferred to or from the CPU or any other I/O device.

BYTE
: A group of eight bits (or binary digits).

CLUSTER OF DATA
: Same as allocation unit.

COMMAND LINE MODE
: A mode of operating the SYSGEN XL subsystem in which all parameters for a given command are entered in a single string. It is distinguished from the PROMPT MODE in which the command and parameters are entered interactively.

CONTROLLER BOARD	An intermediary printed circuit board which links a peripheral device to the CPU or to another peripheral device.
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check. A method of data validation used in transfers of blocks of data to make sure what was sent was actually received.
DEFAULT	A pre-set value or condition in a program, which the user can either change or allow to stand.
DELETE	Erase, remove or eliminate.
DIRECTORY	A portion of disk media used by DOS to create an index of the data found on that logical drive. Also, a portion of a tape fileset which lists the files contained in the fileset.
DISK VOLUME	A physical entity on a disk used for storing data and programs (e.g. A:, B:, C:, etc.).
DMA CHANNEL	A path along which data can be sent in large blocks, with no interruption until the entire block has been sent and received.
DOS	Disk Operating System.
DOWNLOADING DATA	The process of moving data from some external device to the central storage of the computer.
EOT	End of Tape
ERROR	Any condition which could cause the improper reading or writing of data.
FILESET	A collection of files that are moved to a temporary location and then either backed up to tape, or restored to the disk.
FILESET ID	The number assigned by the SYSGEN XL subsystem to the collection of files manipulated in a FILESAVE operation.

FIXED DISK	A self-contained hard disk unit, as contrasted with a floppy disk unit which contains a drive but not the media itself.
FORMAT	The manner in which data is arranged in a record or in a file, including relative position of items, as well as which special characters must come before or after individual items.
GLOBAL COMMANDS	Commands which apply to a program and all of its subprograms.
GCR	Group Code Recording. A method of data encoding used during data transfer which is used to ensure that data is transferred accurately.
HARNESS CABLE	A cable made up of a group of color-coded wires with connectors on either end. See Figure 2-1.
HEAD	The components of the tape drive which convert electrical energy into magnetic energy (or vice-versa) in order to transfer data to and from the magnetic media.
HIDDEN FILE	A file which is protected, and does not show up on a directory listing.
IMAGE	A copy of a volume's content without regard to file structure.
IMAGE ID	The number assigned to a disk volume of data (image) that is transferred to tape during an PRESERVE operation.
INTERFACE CARD	The printed circuit board which serves as the transfer mechanism within a system.
I/O CARD	A printed circuit board that controls data transfers from and to main memory.
MEGABYTE	Approximately one million bytes.
PCB	A printed circuit board.

PROMPT MODE

A mode of operation in the SYSGEN XL subsystem in which the operator interacts with the computer, being prompted for each of the parameters necessary to carry out an FILESAVE or PRESERVE operation.

REREADS

The attempts by the tape or disk drive to read data that has been requested. Depending on the program being run, the drive unit will attempt to read the data a given number of times before reporting an error message and halting the operation.

RESTORE

The process of copying back data that had previously been copied from a main storage unit such as a hard disk.

REWRITE

The attempt by the tape or disk drive to write data that has been requested. Depending on the program's specifications, a given number of retries will be made before an error message will appear.

SECTOR

The amount of disk media required to store 512 bytes (typically) of data.

STREAMING TAPE

A type of magnetic tape technology allowing for extremely fast rates of data reading and writing.

SUBDIRECTORY

An index of programs or files found on a logical drive under a given directory. A directory may have many subdirectories, each of which has a unique pathname.

SWITCH SETTINGS

Dipswitches are located in many peripherals and must be set in a certain way in order for the peripherals to communicate with the main computer or other peripherals. The proper combination is called the switch setting.

SYSTEM FILE

A special hidden file which contains part of the DOS (e.g. IBMBIO.COM, IBMDOS.COM).

TEMPORARY FILE   A space within the disk which is set
                         aside during an FILESAVE operation to be
                         used for temporary storage of files.
                         When all the files are copied into the
                         temporary file, it is written to tape or
                         to permanent positions on the disk and
                         the temporary file is erased.

TRACK   Specific concentric circles of disk
                         medis or longitudinal lines of magnetic
                         tape upon which the read/write heads are
                         positioned when transferring data to or
                         from the drive.

UTILITY SOFTWARE   A general-purpose routine which performs
                         some activity, such as transferring
                         files or preparing magnetic media for
                         recording.

WRITE-PROTECTED   Magnetic tape in a cartridge can be
                         protected from being overwritten by the
                         manipulation of tabs on the cartridge
                         itself. While these are in the write-
                         protect position, nothing can be
                         recorded on the tape.

PROMPT MODE

A mode of operation in the SYSGEN XL subsystem in which the operator interacts with the computer, being prompted for each of the parameters necessary to carry out an FILESAVE or PRESERVE operation.

REREADS

The attempts by the tape or disk drive to read data that has been requested. Depending on the program being run, the drive unit will attempt to read the data a given number of times before reporting an error message and halting the operation.

RESTORE

The process of copying back data that had previously been copied from a main storage unit such as a hard disk.

REWRITE

The attempt by the tape or disk drive to write data that has been requested. Depending on the program's specifications, a given number of retries will be made before an error message will appear.

SECTOR

The amount of disk media required to store 512 bytes (typically) of data.

STREAMING TAPE

A type of magnetic tape technology allowing for extremely fast rates of data reading and writing.

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SWITCH SETTINGS

Dipswitches are located in many peripherals and must be set in a certain way in order for the peripherals to communicate with the main computer or other peripherals. The proper combination is called the switch setting.

SYSTEM FILE

A special hidden file which contains part of the DOS (e.g. IBMBIO.COM, IBMDOS.COM).

Possible causes and action:

- You tried to backup more data than the cartridge can hold. Ignore this backup and repeat the operation on another cartridge. Note that PRESERVE does not support a single backup on two tapes.
- If you feel you have enough tape space but still get this error, you may have a bad tape with a lot of rewrites: change cartridges and clean the heads.
- The cartridge tape drive is bad.
- The interface card is bad.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- Contaminated read-write heads may cause excessive read/writes, wasting tape space.

<44> Missing block or read error

This error means FILESAVE/PRESERVE has difficulty reading a block from the tape. The code is followed by three bytes of diagnostic information indicating the number of bytes (in hexadecimal) that have been successfully read at the time the error was detected. Possible causes and action:

- This is the first time you have used this cartridge and you have answered "N" for the "delete old data" prompt in the backup operation. You should have entered "Y" in order to purge invalid data on the tape that causes subsequent read problems.
- The cartridge used is of poor quality. Try to backup some files onto another cartridge and restore them to ensure that the hardware is working.
- The controller board is bad.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- The read-write heads are dirty or contaminated.

<45> Missing or unexpected BOT/EOT

The controller board has difficulty detecting the Beginning-of-Tape or End-of-Tape positions.

Possible causes and action:

- Tape problem: try another cartridge.
- Ensure the data interface cable between the SYSGEN XL cartridge tape drive and the SYSGEN controller board is firmly seated.
- Dirty BOT/EOT sensor. This sensor is located in the right tape guide. See paragraph 9.1.1.