SCIENTIFIC XPL/4
DOCUMENTATION UPDATE

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PREFACE

This publication explains in detail the new features offered by the Scientific XPL/4 operating system and language. It supplements the material found in the Scientific XPL Reference Manual and in Creating Programs for ABLE Series Computers. Experienced and new XPL users should read this publication carefully. SCRIPT Level II users and Sample-to-Disk system users will want to read the sections on the Winchester, the new monitor commands, the new utility programs, and the Screen Editor.

SUMMARY OF NEW FEATURES

New England Digital's Scientific XPL/4 operating system offers several significant advances over earlier versions of Scientific XPL.

Winchester Disks

First and foremost, Scientific XPL/4 fully supports New England Digital's new line of Winchester disks. These disks offer greatly expanded storage capacity and very fast data transfer rates. Scientific XPL/4 also supports double density minidiskettes (5 1/4 inch), which have more than twice as much user storage space as single density minidiskettes.

A unified computer system can now be assembled with up to eight Winchester disks, single and double density minidiskette drives, and maxidiskette (8 inch) drives. Information can flow and files can be exchanged easily between all storage devices in the system.

To facilitate efficient management of all this storage, a new multi-level subcatalog architecture has been implemented in the Scientific XPL/4 operating system. There are several new monitor commands associated with this new subcatalog architecture, as well as new XPL statements particularly useful in programming for the Winchester disk. (See "New XPL/4 Monitor Commands" and "New XPL/4 Programming Functions".)

CRT Support

The ADM and VT100/VT640 CRT terminals are fully supported by Scientific XPL/4. The interactive Screen Editor makes use of the CRT's text editing capabilities. (See "Using the Screen Editor.") In addition, the Utility Programs now offer easy-to-use screen menu operation. (See "Using the XPL/4 Utility Programs".) Also soon to be released is graphics plotting software for the CRT, the same routines used in New England Digital's Sample-to-Disk signal displays and Music Notation system.

Additional Printer Support

The Scientific XPL/4 operating system can now be used to print listings on many printers: DECwriter, LA-34,

Printronix, PRISM80, and Diablo.

XPL/4 and SCRIPT

Scientific XPL/4 is also available in combination with New England Digital's SCRIPT music language in a single operating system - SCRIPT-XPL/4. Users with systems based on Winchester disk, maxidiskette, or double density minidiskette will be able to run XPL programs and play SCRIPT compositions by typing the appropriate monitor commands (i.e., RUN, PLAY). Of course, SCRIPT requires several special hardware items (such as the digital synthesizer) that are not part of all ABLE computer installations.

Users with systems based on single density minidiskette will not have this option due to storage space limitations on the minidiskette. Different system diskettes must be used for SCRIPT and XPL/4.

Compiler Enhancement

The Scientific XPL/4 compiler has been enhanced. It now runs faster than before and offers a significantly larger symbol table. In addition, new disk buffering routines provide for compilation of much larger files. The compiler now allocates its internal data areas in the optimum way depending on the amount of memory installed in the computer.

HARDWARE REQUIREMENTS

MEMORY AND OTHER BOARDS

Scientific XPL/4 requires a minimum of 32K words of computer memory. Up to 56K memory is supported.

Systems with a Winchester disk also require a D4567 Multiply/Divide unit.

TERMINAL

An ADM or VT100/VT640 terminal should be used with Scientific XPL/4. Operation with only a hard-copy terminal (such as a DECwriter) is not recommended.

STORAGE DEVICES

To operate Scientific XPL/4, you must have either dual diskette drives (system and user) or a single diskette drive plus a Winchester disk. You can also have one or two remote minidiskette drives.

Drives for single density or double density minidiskettes (5 1/4 inch) or single density maxidiskettes (8 inch) can be used. Double density minidiskettes offer over twice the storage space of single density minidiskettes (i.e., 400 sectors as opposed to 175).

You may use both double and single density diskette drives in the same system. In this case, use the double density drive for the system drive. User and remote drives can then be either single or double density. If the system drive is single density, user and remote drives must be single density as well.

A Winchester disk of any size will significantly speed up editing sessions and shorten compilation time, as well as increase the storage space tremendously. The data transfer rate to and from all the Winchester disks is greater than 100,000 bytes per second. The 5 1/4 inch Winchester disk offers 5 megabytes of storage capacity and the two 8 inch Winchester disks offer 10 or 20 megabytes storage capacity. Up to four Winchesters of the same or different sizes can be added to the computer installation.

Although you only need one diskette drive if you have a Winchester disk, a second diskette drive is handy for backup

in case of Winchester breakdown. Diskette drives are also slightly more portable than the Winchester.

SOFTWARE SUMMARY

This chapter describes the different types of diskettes, the new software that is stored on them, and the configuration required for different systems.

DISKETTE TYPE

Scientific XPL/4 is available on and supports three types of diskettes: single density minidiskettes, double density minidiskettes, and single density maxidiskettes.

All XPL/4 users, including those with Winchester disks, must receive the proper diskette for the type of disk drive(s) in their system. This information must be specified whenever software is ordered.

NEW DISKETTES

Earlier versions of Scientific XPL have been stored on system diskettes, user diskettes, and optional program diskettes. To realize the new features of XPL/4, several additional diskettes have been developed.

Utility Programs Diskette

The utility programs are no longer stored on the Scientific XPL system diskette. They are stored on a separate diskette - the Scientific XPL/4 Utility Programs diskette - which is placed in the right-hand drive in dual drive systems. Note that there is extra space on many system diskettes in which the user can store frequently used utility programs. All utility programs can be stored easily on the Winchester disk.

Scientific XPL/4 System/Large Work File Diskette

The Scientific XPL/4 System/Large Work File diskette is available on double density minidiskette and on maxidiskette. The Large Work File provides the work space needed for the compilation of very large programs at the expense of the extra storage space for utility programs.

Scientific XPL/4 Screen Editor System

Due to space limitations, the Screen Editor is not normally available on single density minidiskette. However, the Scientific XPL/4 Screen Editor System minidiskette is available, at extra cost, for single density minidiskette users who want to use the Screen Editor. The Screen Editor is the monitor in this version; only screen editor commands may be used. (See "Using the Screen Editor.") Similarly, a SCRIPT Level II system diskette with the Screen Editor as monitor is also available at extra cost.

The following two new diskettes are used only with Winchester disk-based systems.

Winchester Installation Diskette

The Winchester Installation Diskette is used to format the Winchester disk and to copy the Scientific XPL/4 operating system onto it. We use this diskette here at New England Digital to initialize Winchester systems. You will use it to copy future XPL updates or other software modules onto the Winchester as well as to replace accidentally erased systems. See "Using the Winchester Disk" for instructions on the installation process.

Winchester Bootload Diskette

The Winchester Bootload Diskette is used to instigate loading from the Winchester rather than from the floppy disk drive at future power-on's. See "Using the Winchester Disk."

DISKETTES SUPPLIED

Users of all computer systems will receive two copies each of the following diskettes.

Scientific XPL/4 System Diskette
Scientific XPL/4 User Diskette
Scientific XPL/4 Utility Program Diskette

Users of Winchester-based systems will also receive two copies each of the Winchester Installation and Winchester Bootload diskettes.

The Large Work File double density minidiskette and maxidiskette and the Screen Editor System and SCRIPT single density minidiskettes are available on order at extra cost.

DISKETTE CONFIGURATION

All system diskettes, the Winchester Installation and Bootload diskettes, and the Screen Editor System diskette must be configured to match the memory size, diskette type, terminal type, and printer type of the user's system. In general, all diskette configuration is done here at the factory. If you are updating a system, perhaps by adding memory, changing terminals or adding a printer, you will have to reconfigure your own system diskettes. For an explanation of the configuration process, see "Using the XPL/4 Utility Programs."

When the Scientific XPL/4 operating system is copied onto the Winchester, it is automatically reconfigured for number and size of Winchester disks.

USING THE WINCHESTER

Winchester Bootload Diskette

When you receive your Winchester disk, a permanent copy of the Scientific XPL/4 operating system will already be stored on it. You will use the special Winchester Bootload Diskette to load, or boot, this operating system.

1. Turn on the computer.

2. Insert the Winchester Bootload Diskette into the left-hand drive and press the LOAD button. As soon as the Winchester gets up to speed (about 30 seconds) the following words

   Scientific XPL/4

   READY

   will be displayed on the screen.

3. Type CAT ALL.

   A list of all the XPL/4 system files stored on the Winchester disk will be displayed on the screen. This is the top level catalog for the complete Winchester subsystem. (For more on catalog levels, see the next chapter.)

4. Try this simple test program and you will experience the speed of Winchester compilation.

```
NEW TEST

10 PRINT 'HELLO';
20 PRINT 'GOODBYE';
30 EOF

RUN
```

Now you can create, run, and store your own programs and files on the Winchester disk using the XPL monitor commands described in Creating Programs for ABLE Computers, plus the new subcatalog commands described in the next chapter. The interactive Screen Editor is also available for use. If you are unfamiliar with the Screen Editor, see the chapter "Using the Screen Editor" in this manual.

Note that regardless of the number of Winchesters attached to the computer, they will all be treated by the XPL/4 monitor and by you as a single storage device or subsystem. You do not need to use storage device identifiers to access a particular file; in fact, you will not necessarily know on which Winchester disk a particular file is saved.

Winchester Installation Diskette

Each Winchester disk must be formatted before use and the Scientific XPL/4 operating system must be copied onto the Winchester. The Winchester Installation Diskette is used to perform these tasks here at the factory. You will use the Installation Diskette to copy future updates onto your Winchester or to replace accidental erasures.

The procedure is as follows:

1. Turn on the computer.

2. Wait 30 seconds until the Winchester gets up to speed.

3. Insert the Winchester Installation Diskette into the left-hand disk drive and press the LOAD button.

   Complete formatting and copying instructions will appear on the screen. You will need an XPL/4 system maxidiskette or XPL/4 system and user minidiskettes from which the system files can be copied. At this or a later time you may also copy SCRIPT Level II, SCRIPT-XPL/4, the utility programs, the Signal File Manager (for the Sample-to-Disk system), Synclavier®II timbres and sequences, and MAX system files from diskette onto the Winchester.

When the XPL/4 operating system is copied onto the Winchester, it will be automatically configured for the size and number of Winchesters in the subsystem. If you expand this subsystem at any time by adding an extra drive, you will have to format the new Winchester. You will not want to use the Installation Diskette for this purpose unless you first save all your user files on diskette. Alternatively, you can use the FORMCOPY program and format only the new drive. (See "Using the XPL/4 Utility Programs.")

After formatting, you will then have to run the CONFIGUR program and specify the new number of disk drives in your Winchester subsystem.

Accessing Timbres and Sequences

The timbres and sequences on the SCRIPT Level II system diskette will be copied onto the Winchester along with the SCRIPT operating system. Access them as you would any other timbres and sequences on the system diskette. You can use the timbres and sequences stored on other Synclavier (R) II diskettes in the following way.

1. Use the Bootload diskette to load the system.

2. Type PLAY to transfer control to the Synclavier (R) real-time system.

3. Insert the appropriate timbre diskette in the F0 drive.

4. Press the DRIVE SELECT button on the Synclavier (R) II keyboard and hold it down while you press a TIMBRE BANK button or a RECORDER STORE/RECALL button.

NEW MONITOR COMMANDS AND CATALOG STRUCTURE

XPL users are familiar with the various monitor commands such as OLD and NEW, SAVE and REPLACE, which are used to direct the operation of the computer system. (If you are a new user, turn to the yellow manual, Creating Programs for ABLE Series Computers, for an explanation of these commands.)

Several new monitor commands have been implemented in the Scientific XPL/4 operating system. One activates the screen editor (SED), another activates the Signal File Manager (SFM), and others are SCRIPT commands (STORE, RECALL, PLAY, CONVERT). In SCRIPT Level II the command CONVERT is now used instead of COMPILE to translate a SCRIPT composition into a Synclavier II sequence. All the other commands mentioned are documented elsewhere.

Certain new XPL/4 commands (CCA, CLC, ENTER, CNA, and CAT OF) are used in organizing the large numbers of files that can be stored on a Winchester. These commands are described below.

CREATING AND ENTERING SUBCATALOGS

In earlier versions of XPL, there was one directory for the files on each diskette. This directory was stored on the first sector of the diskette and had room for up to 32 filenames.

The Winchester disk has room for much more information and many more files than can be stored on diskette. A single catalog for all the possible files would be unwieldy to use. Therefore, a tree-like catalog architecture has been implemented in XPL/4 so that files may be organized into manageable groups. In this architecture, the overall master catalog is divided into subcatalogs. Each subcatalog can be further divided into smaller subcatalogs.

A subcatalog has a name, a directory for up to 32 names (of files and/or subcatalogs), and a user specified amount of storage space on the disk. (Large subcatalogs with room for up to 128 names can also be created.)

To explain how the various subcatalogs are accessed, we have developed a new concept: the current catalog, somewhat akin to the current file. Only files stored in the current catalog are listed by the CAT command. You use the ENTER command as described below to make a particular subcatalog

the current catalog. The files in the current catalog can be accessed directly by the monitor commands and can be copied from one storage device to another, printed out as a group, and shuffled. (See "Using the XPL/4 Utility Programs.")

When you first load the XPL/4 system, the master or top level catalog will be the current catalog. The top level catalog is a general directory for the entire user storage space in the Winchester subsystem. There can be up to 128 names for files and/or subcatalogs. To see the names in the top level catalog, type CAT or CAT ALL right after Bootloading the system. Typically this top level catalog is used for XPL/4, SCRIPT, and other system files and for subcatalog names.

Creating a Subcatalog

To create and store a subcatalog of the top level catalog, or of any current catalog, follow this procedure. First "name" the new subcatalog using the new CCA command. Then save the subcatalog on disk and specify its size in number of sectors.

First type

CCA <subcatalog name>

to create the subcatalog. The specified subcatalog name consist of up to eight characters. (Note that in this and following examples the angle brackets < and > are used to indicate a symbolic name or value that is supplied by the user. You do not use the brackets when actually entering commands.)

Next type

SAVE,<length>

The length of space to be reserved for the group of files in the subcatalog is specified in sectors. The directory itself will require one sector. This is automatically added to the length specified in the SAVE command. For example, the command

SAVE,20

will actually reserve 21 sectors on the disk, 20 for the files and one for the directory. The subcatalog must fit within the block of space reserved for the current catalog.

If you specify too many sectors or if the space has already been reserved for other subcatalogs, an error message will appear on the screen.

Backup copies of Winchester files can and should be stored on diskette. For this purpose, it's a good idea to establish the subcatalogs in lengths that will fit comfortably on the type of diskettes that you use: up to 175 sectors for a single density minidiskette, up to 400 sectors for a double density minidiskette, and up to 615 sectors for a maxidiskette.

You may also establish large subcatalogs with room for up to 128 names. In this case, four sectors will be reserved for the directory.

To create a large catalog, type

CLC <subcatalog name>

Entering a Catalog

The ENTER command is used to access a subcatalog.

The format is

ENTER <subcatalog name>

The specified subcatalog will become the new current catalog.

To display the new current catalog, type CAT or CAT ALL.

Note that there is also a related XPL/4 ENTER statement. Its use is described in the chapter on new programming functions.

USING COLONS

When you use the above ENTER command or any command such as OLD or REP, the monitor will search in the current catalog for the specified file or subcatalog name. If it finds the name, it performs the command. Otherwise, it will print an error message, stating that the particular subcatalog or file is not saved.

In order to allow access to files and subcatalogs that are not listed in the current catalog, a new convention using

colons has been implemented. This feature is called tree climbing. You can use colons before filenames or catalog names in all monitor commands to direct the monitor on a search through the different catalog levels. The monitor will look in the catalog typed just before the the colon for the name typed just after the colon.

The first colon indicates the top level; the following colons climb the tree from level to level. Commands with colons are effective from any level in the catalog architecture.

Entering Different Catalogs

When there is no catalog name before or after the colon, as in

```
ENTER :
```

the monitor will restore the top level catalog.

When there is no name before the colon, but there is a name after it, as in

```
ENTER :SUBCAT1
```

the monitor will look in the top-level catalog for the named subcatalog or file. It will then perform the command. In this example, the monitor will make SUBCAT1 the current catalog.

When there are several colons, as in

```
ENTER :SUBCAT1:SUBCAT2:SUBCAT3
```

the monitor will follow the path that you set out, checking catalog after catalog until it reaches the end of the command. Or until it cannot find a named catalog or file. In this example, the monitor will look in the top-level catalog for SUBCAT1. If successful, it will then look in the SUBCAT1 catalog for SUBCAT2. If successful, it will then look in the SUBCAT2 catalog for SUBCAT3. Finally, it will make SUBCAT3 the current catalog.

Finding Out the Name of the Current Catalog

At any time, to find out the name of your current catalog, simply type

```
CNA
```

The catalog name will be instantly printed on the terminal screen.

Using the CAT OF Command

It is also possible to use tree climbing to access different subcatalogs and their files without changing the current catalog.

The CAT OF command is used to display a catalog different from the current catalog. Type the words CAT OF followed by as many colons and subcatalog names as required. For example, if you typed

```
CAT OF :SUBCAT1:SUBCAT2:SUBCAT3
```

the monitor would search down through the levels and display the catalog of SUBCAT3. But the current catalog would not be changed.

Additional Examples

The following examples will help to clarify the use of the new catalog structure. The current catalog will not be changed in any of these examples.

Example:

```
OLD :SUBCAT1:SUBCAT2:FILE1
```

FILE1 in SUBCAT2 would become the current file. SUBCAT1 is a subcatalog of the top level catalog. SUBCAT2 is a subcatalog of SUBCAT1.

Example:

```
OLD SUBCAT1:FILE1
```

The monitor could interpret this command successfully, only if SUBCAT1 was a subcatalog of the current catalog.

Using the Subcatalog Structure on Diskette

The subcatalog structure was primarily designed for use with the Winchester. However, there is no reason you cannot use subcatalogs on diskettes as well. If you are not operating from a Winchester, the top level catalog will be the catalog stored in sector-0 on the user diskette in the right-hand drive. Every time you insert a new diskette into this drive you should type

ENTER :

to establish a new top level catalog. Otherwise certain errors and confusion can occur.

You can also use the CLC command to create a large subcatalog for your diskette. This will enable you to save up to 128 files on your diskette, instead of the previous 32. Of course, the number of sectors, or total storage space, on the diskette will not be expanded by this process.

Accessing Files on Diskette

If you are operating from a Winchester and wish to access a file on a diskette, use the /F1 and /FØ device identifiers.

Example:

CAT OF /FØ

This command would display the top level catalog of the diskette in the left-hand drive, as in earlier releases of XPL.

Example:

CAT OF SUBCAT1/F1

This command would display a subcatalog of the top level catalog of the diskette in the right-hand drive.

Example:

OLD SUBCAT1/F1:FILE1

This command would search through that subcatalog for FILE1, which would become the current file.

```
OLD SUBCAT1/F1:SUBCAT2:FILE2
```

This command would search through SUBCAT1 for SUBCAT2 and through SUBCAT2 for FILE2, which would become the current file.

NEW XPL/4 PROGRAMMING FUNCTIONS

Scientific XPL/4 offers changes in the compiler and new statements. Programmers should study this section carefully.

COMPILER OPERATION

Compiler operation has been enhanced in two ways. New symbol table routines significantly expand the size of the symbol table. Secondly, new disk buffering routines provide for compilation of much larger files. The compiler now allocates its internal data areas in the optimum way depending on the amount of memory in the computer.

Another new feature allows you to track the compilation process. If you press any key on the terminal keyboard during compilation, the linenumber of the line currently being compiled will be printed on the terminal screen.

ENTER STATEMENT

To assist in the development of very large programs in Winchester based systems, an ENTER statement has been implemented. It is used along with the INSERT statement to insert, into the program currently being compiled, source files from different subcatalogs within the system. (Subcatalogs are described in the previous chapter.)

The ENTER statement causes the compiler to access the specified subcatalog. Then succeeding INSERT statements access source files listed in the specified subcatalog.

The statement takes the form:

<linenumber> ENTER '<subcatalog name>';

For example,

```
100 INSERT 'SOURCE';     /* inserts source file from current catalog */
110 ENTER  'SUBCAT';     /* enters subcatalog of the current catalog*/
120 INSERT 'SOURCE2';    /* inserts source file from new current catalog */
```

The colon is used to indicate top level. If the colon is used with no subcatalog name, as in

```
100 ENTER ':';
```

then the top level catalog in the system will be entered. If the colon precedes a subcatalog name, as in

```
110 ENTER ':SUBCAT1';
```

then the specified subcatalog of the top level catalog will be entered.

The asterisk can be used to indicate a return to the beginning subcatalog, as follows:

```
140 ENTER '*';
```

The catalog specified at the start of the program will be entered.

Tree climbing is accomplished by multiple ENTER statements. For example,

```
100 ENTER ':';              /* enters top level catalog */
110 ENTER 'SUBCAT1';        /* enters subcatalog of top level catalog */
120 ENTER 'SUBSUBC';        /* enters subcatalog of SUBCAT1 */
```

NOTE: This is different from the monitor command ENTER in which tree climbing can be accomplished within a single command.

WINCHESTER DISK SIZE

Programmers may wish to know the number of sectors on the different sizes of Winchester disks. There are 512 bytes (256 words) per sector.

Disk size	5 1/4"	8"	8"
Megabytes	5	10	20
Total sectors	10,8000	20,000	37,320
Sector numbers	0-10,799	0-19,999	0-37,319

READDATA and WRITEDATA

Two new functions have been added to facilitate reading and writing data from large devices such as the Winchester disk subsystem. They are the READDATA and WRITEDATA routines and take the place of DISKREAD and DISKWRITE.

The statements take the following form

<linenumber> CALL READDATA (<MSB>, <LSB>, <ARRAY>, <LEN>);

or

<linenumber> CALL WRITEDATA (<MSB>, <LSB>, <ARRAY>, <LEN>);

The first two arguments, MSB (most significant bit) and LSB (least significant bit), contain a 32-bit word pair which identifies which sector of the disk subsystem is to be accessed.

If the upper eight bits of the word pair are zero (MSB = 0), then the lower 24 bits will identify a particular sector of the disk subsystem. This 24-bit sector number was implemented for use in large Winchester sustems with more than 65,535 sectors. The XPL/4 operating system will automatically determine which disk contains the specified sector. This feature is very useful in Winchester subsystmes where several disks are combined to form one logical storage space.

If desired, a drive number can be specified in the upper eight bits of the MSB-LSB word pair. Then the LSB will indicate the sector number on that drive. Drive numbers for Winchesters are W0 = 0, W1 = 256, W2 = 512, W3 = 768, etc.

For example,

110 CALL READDATA (256,9,BUF,512);

This statement reads 512 words of data from Winchester drive 1 (MSB = 256) starting with sector 9 (LSB = 9).

On dual disk floppy systems, there are two ways of indicating drive number. If MSB is 0, specifying a LSB of 0 will access the left-hand drive (F0) and specifying a LSB of 10000 will access the right-hand drive (F1) as before. Alternatively, drive 1 can be referenced by specifying MSB equal to 256.

CONFIGURATION STATEMENT

The CONFIGURATION statement allows the programmer to specify certain system configuration restraints that will followed during the compilation of a program. Use the word CONFIGURATION followed by a list of symbols separated by commas. Certain symbols require a value. Use the symbol followed by a space and then a fixed point value. For example,

```
100 CONFIGURATION MAXI,MODELA,MEMORY 40*1024,NOMULDIV,NODMA,PTYPE 1;
```

Symbols are selected from the list below:

MAXI	system device is MAXIDISKETTE
MINI	system device is MINIDISKETTE
MODELA	CPU Model-A
MODELB	CPU Model-B
MEMORY <#>	absolute memory size (core)
PNULLS <#>	number of "null" characters to send after a character PRINT
SNULLS <#>	number of "null" characters to send after a character SEND
MULDIV	use hardware multiply/divide unit
NOMULDIV	use software Multiply/Divide routines
DMA	set bit signifying D02 Direct Memory Access board is installed
NODMA	opposite of above
PTYPE <#>	set terminal type to this number (for PRINT statement)
STYPE <#>	set printer type to this number (for SEND statement)

Terminal and printer type numbers are:

0 unknown	6-8 unassigned
1 hardcopy (DECwriter)	9 DECwriter II
2 ADM 3a/ ADM 5	10 LA-34/DECwriter IV
3 VT100/VT645	11 Printronix
4 Datamedia	12 Paper Tiger/PRISM
5 Zenith-19	13 Diablo

USING THE XPL/4 UTILITY PROGRAMS

The XPL/4 Utility Programs are more versatile and more convenient than before. New easy-to-use screen menus list all options and offer prompts that tell you what to type when.

There are now five Utility Programs.

CONFIGUR is used to record within a copy of the XPL/4 operating system information about the physical setup of the computer installation. This information includes memory size, terminal and printer type, processor type, real-time clock speed, presence or absence of remote drives and/or musical interfaces, storage device type, and user experience level. You can configure the Winchester system disk as well as system diskettes located in any attached drive.

LISTING is an enhanced version of the earlier INDENT program and is used to print out permanent listings of XPL programs. You can now print one or several copies of the files on any attached storage device. You can also print out a subcatalog of files or specify any list of files from within the current catalog. LISTING supports several printers.

FORMCOPY combines and adds to the functions of the earlier FORMAT, DUPLICAT, REMFORM, and REMCOPY programs. It is used to format diskettes or Winchester disk and/or copy files from any storage device in the system to any other. All the files on a diskette, all the files listed in a subcatalog, as well as individual files can be copied. Existing files on the destination storage device can be written over or added to.

SHUFFLE is used to reorganize the contents of a storage device to make room for more files. Any spaces between files and/or subcatalogs are moved to the end of the storage device. Any storage device, as well as the current catalog, can be shuffled.

WINDUMP is used in the Sample-to-Disk (tm) system to dump a sound file from the Winchester onto a series of floppy diskettes for backup and future restoration to the Winchester. This utility overcomes the two-second limit on recordings imposed by the small storage capacity of an individual minidiskette. It is also used to restore the file onto the Winchester from the series of floppies.

DEVICE IDENTIFIERS

An important and time-saving feature of all the new Utility Programs is the quick access to any storage device in the computer installation. The menu in each program allows you to specify on which device you want to perform the utility function. You can also perform many utility functions on subcatalogs.

The storage device identifiers used in all the Utility Programs are:

FØ Floppy diskette in drive-Ø (left-most)

F1 Floppy diskette in drive-1 (right-most)

RØ Minidiskette in remote drive-Ø

R1 Minidiskette in remote drive-1

WØ Winchester disk subsystem

CC Current catalog

USING THE UTILITY PROGRAMS

You will receive the Utility Programs on a special Utility Programs diskette. If you are operating from a Winchester system, you can use the Winchester Installation Diskette to copy these programs onto the Winchester. If you are using a dual drive system, place the Utility Programs diskette into the right-hand drive. Then, to use a program in either system, simply type

```
OLD <utility filename>
RUN
```

There is room on certain XPL/4 system diskettes (i.e., maxidiskettes and double density minidiskettes) for storage of at least some of the Utility Programs. You can store any frequently used program, for example FORMCOPY, on such a diskette. To use a utility program on the system diskette, type

```
OLD <utility filename>/FØ
RUN
```

To perform any of the Utility Programs on the files in a

subcatalog, you must first recall the Utility Program, next enter the desired subcatalog, and then run the program, as follows:

```
OLD <utility filename>
ENTER :<subcatalog name>
RUN
```

The subcatalog thus entered will be the current catalog for the purposes of the program.

Once you type RUN, just follow the instructions on the screen. Although each program offers many options, you will probably use the default options in most cases. The following pages supplement the information supplied on the screen.

CONFIGUR

Be aware that certain wrong responses in the configuration process can make your system diskette incapable of loading your computer. Read the following carefully and use care when running the CONFIGUR program.

The CONFIGUR program is divided into two levels: basic and comprehensive. In most cases you will use the basic level which allows you to change the current configuration of your operating system for three parameters: memory size, terminal type and printer type.

Notes on the basic menu:

Memory — There are 8K words of memory for each M8K board installed in slots 1 through 7 in the computer. Make sure the memory configuration matches the memory that you actually have.

CAUTION: If you specify more memory than you have, you will not be able to load the system.

Terminal — Make sure the terminal type is the same as the device actually attached to the TERMINAL port. If it is not, garbage will appear on the screen and the Screen Editor will not function correctly.

Printer — Make sure the printer type is the same as the device actually attached to the PRINTER/MODEM port.

The comprehensive configuration level can be used to configure operating systems on any device in the system and to specify several additional operational parameters. This level is provided if, at the very first prompt, you type GO instead of pressing RETURN. Then you will be asked for the location of the disk device you wish to configure and the appropriate comprehensive configuration will appear on the screen.

Notes on the comprehensive menu:

Processor — This parameter is set at the factory; it is unlikely that you will have to change it.

Computer Options — These are basically yes or no options that will need to be changed if you upgrade your system. The real-time clock speed may now be configured. This is handy to know if you're

setting up timing loops that deal with screen/user interaction. Normal speed for Able series computers is 100 Hz. For Synclavier (R) systems it is 200 Hz.

Music Interfaces — These are yes or no options indicating presence or absence of interface boards.

Storage Device Type — This option allows you to specify which device the XPL/4 operating system is running from. If you are expanding a system by adding Winchester(s), you will have to specify the new number and size of Winchesters. Other options are single density system and user minidiskettes; single density system and user maxidiskettes;; and double density system minidiskettes and single or double density user diskettes.

CAUTION: If you specify the wrong storage device type, you will not be able to load the system.

User Experience Level — This new option allows prompts and any other user interface in a program to be geared to the computer experience of the user. Certain of the prompts in the Utility Programs are based on user experience level. XPL programmers can use this parameter in any variety of ways.

LISTING

The LISTING program is used to print out listings of XPL source files from any attached storage device or from subcatalogs. Remember, if you plan to print files from a subcatalog, you must type

```
OLD LISTING
ENTER :<subcatalog name>
RUN
```

Notes on the menu:

Page Title	This title will be printed on the top of each page of the listing. It's a convenient place to put the date.
Printer Device	The printer or terminal listed is based on the printer configuration of your operating system. To override this configuration, you can enter any of the following: Terminal, Decwriter, La-34, Printronix, Paper Tiger, or Diablo. This choice of printer will assign certain default settings for page width and length, and start of the comment column.
ALL FILES or FILE by FILE	This parameter toggles between two printing modes: all the files on a storage device or just selected files. Just press the 3 key to change from one mode to the other. When in the "file by file mode", you may specify a list of files in advance of printing and they will be printed in that order. You do not have to wait around until one file is printed before you can specify the next.
Index	This option prints out an index of the file(s) that are being listed. The program will read through all the selected file(s) and print out the page number on which each file begins as well as the length in words of each file. It also prints each PROCEDURE, INSERT, and WHEN statement along with its line number and page number in the listing.
Number of Copies	You can specify any number up to 32,000.
Page Length	You can change the default page length to any number of lines per page. (Of course, within the limits physically possible on your paper or printer.)
Page Width	You can change the default page width to any number of characters per line. (Again. Within the limits of your paper and printer.)

Comments	You can locate the beginning of comments in any column.
Storage Device:	You can specify any storage device in the system.
Current Catalog	Unless you entered a subcatalog before you ran this program, the current catalog will be the top level catalog on the Winchester or on the diskette in the F1 drive in systems without a Winchester.

Special Text Key Words

The name of the file being listed is printed on the top line of each page of the listing along with the page number. If you use the symbol $TITLE in a comment, such as

```
/*$TITLE Inventory Program*/
```

the words following the symbol will be printed in the center of the second line on each page of the file listing. Similarly, by using the symbol $SUBTITLE in a comment, you can give a heading to a section in your file.

Both $TITLE and $SUBTITLE symbols cause the listing output to start a new page and appear in the index.

SHUFFLE

The SHUFFLE program is used to pack files and subcatalogs together towards the beginning of the storage device so that there is more room for storage of new files. The files on any storage device connected to the computer can be shuffled. You can also rearrange the files on the storage device so that certain files are collected into adjacent areas of the diskette.

In addition, the files listed in a subcatalog can be shuffled. To do so, type

```
OLD SHUFFLE
ENTER :<subcatalog name>
RUN
```

The SHUFFLE menu is very short and simple to use. To specify or change the storage device to be shuffled, type DEV. You will then be given a list of possible devices and asked for your selection.

To see a catalog of the files on the currently selected device, type CAT.

To specify a list of files to be collected, type COL.

To initiate a shuffle, type GO. As the shuffle proceeds, the program will indicate what file it is operating upon. Note that it may take between 15 to 20 minutes to complete a shuffle on the Winchester.

Be careful never to try to stop a shuffle. The keyboard is automatically disabled during a shuffle, but pressing the LOAD button or turning off the power could cause you to lose data off your disk.

Press RETURN while at the menu to terminate the SHUFFLE program. of a performance, but you can always press RETURN instead of GO to return to the monitor.

FORMCOPY

The FORMCOPY program is used to format any storage device in the system and to copy files from any device to any other. You can also copy to or from a subcatalog. Remember, if you plan to copy to or from a subcatalog, you must type:

```
OLD FORMCOPY
ENTER :<subcatalog name>
RUN
```

Since there can only be one current catalog, and since the current catalog is the only means of accessing the files of a subcatalog, you cannot transfer files from a subcatalog to a subcatalog.

After you type RUN, the program will ask you if you wish to use the FORMAT and/or COPY options.

Depending on your answers to these questions a specific menu display will appear below. Any time you make a mistake or want to respecify FORMAT or COPY options, press RETURN. You will be returned to the beginning of the program. Only when you specifically type GO will any formatting or copying actually begin.

In most cases, you will probably just answer the first two questions and then type GO after making sure you put your diskettes into the correct drives.

CAUTION: This program is very powerful. It can obliterate valued information fast if you're not careful.

FORMAT

The FORMAT option is preset to format the F0 diskette. If the diskette you wish to format is in the left-hand drive, simply type GO. To format a different storage device, enter a different device identifier. Then type GO.

The GO step works differently depending on the user experience level configuration in the current operating system. If the user experience level has been set at 50 or less (for an inexperienced user), the GO step will be followed by another safety prompt before formatting actually begins.

If for any reason the device is defective and cannot be formatted, a message will appear on the screen.

Note: By selecting the CPM option, you can direct FORMCOPY to format diskettes for use with the CPM operating system.

Once a diskette has been formatted for CPM, it must be reformatted before you can use it with the XPL/4 operating system.

COPY

The COPY option will copy the files from a source device onto a destination device. Unless you specify otherwise, the source will be the F1 diskette and the destination will be the F0 diskette. You can change source and destination to any attached storage device or to the current catalog. You can also review the contents of the selected source or destination.

Copy Modes

Ignore option 6 if you wish to erase the destination catalog and write the source files over the destination files. If you wish to save the destination catalog and add new files to it, you can use the additive and/or selective modes.

In the additive mode, the files on the destination are not destroyed. Rather they are added to or replaced on a file by file basis. Each source filename is checked against the destination catalog. If the filename already exists in that catalog, the program will halt until you specify whether you want to transfer the source file or retain the old destination file.

In the selective mode, the program will halt before each file transfer until you specify whether you want to transfer the file or not.

If you are transferring files from diskette to the top level catalog of the Winchester, you must use the additive or selective modes. Otherwise you will destroy the top level catalog and all the information stored on the Winchester. There is a prompt built into the COPY program that will help prevent such erasures.

As the files are transferred, their filenames will be listed on the screen. Note that you can stop the COPY program at any time by pressing any key on the keyboard.

If there is not enough room on the destination storage device for all the source files, a message to that effect will appear on the screen. At this time you have the option of inserting another diskette in the destination storage device and continuing the COPY process. This can be repeated as long as necessary. Individual files cannot be divided by this process.

Finally, if for any reason either the source or the destination device is defective and files cannot be copied, a message to that effect will appear.

FORMAT AND COPY

You can format a diskette and copy onto it in one operation. The default source is the F1 diskette and the default destination, and device to be formatted, is the F0 diskette. Although you can change source, destination, and copy mode, you will probably use this option most often by inserting the diskettes in the correct drives and quickly typing, "Yes", "Yes", "GO".

WINDUMP

This utility is used when you wish to copy a sound file or subcatalog, that is stored on the Winchester onto floppy diskettes. WINDUMP breaks the file or subcatalog up into a series of segments that are dumped onto the diskettes.

You use the WINDUMP utility in a manner similar to the other utilities by answering a series of questions on the terminal screen. You will specify whether or not you wish to format the floppies before copying, as well as the location and type of the diskettes you are using.

WINDUMP is also used to restore the file from the series of floppies back onto the Winchester. You may copy the diskettes in any order, since a number code is written onto each diskette during the original copying process.

USING THE SCREEN EDITOR

The Screen Editor is a very fast and convenient way to enter and edit text on a CRT terminal. You can position the terminal's cursor directly over the location of an incorrect character and change it, or you can insert more text into the line at that location. The text which surrounds the location of your change is always visible.

The Screen Editor is included in XPL/4 and SCRIPT Level II operating systems on Winchester disk, maxidiskette and double density minidiskette. For single density minidiskette systems, special XPL/4 and SCRIPT Level II Screen Editor System diskettes, which contain the Screen Editor but not the standard monitor, are available on order. These systems can be used to edit text files, run XPL/4 source programs and play SCRIPT compositions. But they cannot run compiled XPL/4 programs or play converted SCRIPT sequences.

SCREEN EDITOR REQUIREMENTS

Terminals

The Screen Editor will operate with the following terminals available from New England Digital: the DEC VT100, the Retro-Graphics VT640, or the Lear-Siegler ADM-3A and ADM 5.

Diskette Configuration

For the Screen Editor to work properly, your system diskette must be configured for the correct terminal. If your system has been shipped as a package from New England Digital, this should have been performed at the factory. If you are adding or changing terminals, you may need to reconfigure your system diskette. See the instructions for the CONFIGUR program in "Using the XPL/4 Utility Programs".

ENTERING THE SCREEN EDITOR

To enter the Screen Editor in all XPL/4 or SCRIPT systems except those that use single density system minidiskettes, you type the monitor command SED. The current file under the monitor will become the current file under the Screen Editor (if it is a text file - the Screen Editor does not accept compiled files) and the first 23 lines of the current file will be displayed on the screen. If there is no current file, (e.g., you have just loaded the system), the current file will be empty. Recalling an old file or creating a new one is described below. But for now, simply recall an old file (type OLD <filename> RETURN) before you type SED so that you have a file to look at while you read through the following descriptions.

To enter the Screen Editor in a single density minidiskette system, you load from either the XPL/4 or SCRIPT Screen Editor System diskettes. The standard New England Digital monitor will not be available. The editor will first ask you for the name of a file saved on your diskette. Whatever file name you type (followed by a RETURN) will become your current file. If you press RETURN without typing a file name, an empty file will become your current file.

THE SCREEN EDITOR DISPLAY

Under the standard monitor, the contents of the current file are visible on the screen only when you type the monitor command LIST. As more lines are listed, the previous lines scroll up out of view. You add new lines to the file by preceding them with line numbers and the monitor sorts the new lines into the file by line number. To change a line, you retype it with the same line number or use the editing commands, such as CHANGE or DELETE.

The Screen Editor display is very different from a listing. It consists of 23 lines of text from the current file. Along the left-hand side of the screen is a column of letters called the command column. Along the bottom is the status line. And located somewhere on the screen is the cursor.

The line on which the cursor is located is called the current line. The number of this line can be seen on the status line below. (The Screen Editor numbers the lines in the current file for you, starting with one and increasing by one.) Also on the status line will be displayed the current filename and either of two expressions which tell you when the current file has been altered by the Screen

Editor (modified) or when it is the same as the version saved on your user diskette (unmodified).

When the cursor is on one of the letters in the command column, the keys pressed on the keyboard are interpreted as commands. Typed characters do not appear on the screen.

When the cursor is located anywhere to the right of the command column, typing text on the terminal will change the current file. The cursor position will indicate the location in the current file where the next character of text will be inserted, changed or deleted.

MOVING THE CURSOR

The ease with which you can move the cursor around on the on the screen is what makes the Screen Editor so useful. You can move to any spot in the 23 lines of text displayed on the screen or you can scroll the text forward or backward to display different 23-line segments of the current file.

Moving the cursor to different locations on the screen does not change the current file. Experiment with each key as you read about it.

The Arrow Keys

The VT100 terminal has four keys labeled with arrows pointing in the four cardinal directions: up, down, left and right. Pressing any of these four keys will move the cursor one space in the indicated direction. When the cursor is at the right end of a line of text, pressing the right arrow key will return the cursor to the command column. Similarly, when the cursor is on the command column, pressing the left arrow key will move it to the right end of the line.

The arrow keys do not appear on the ADM-3A terminal and those that do appear on the ADM 5 are not compatible with the Screen Editor program. On all ADM's, therefore, you press CTRL-H to move the cursor to the left, and press ESC to move it to the right. Up and down movement within the text is not implemented on the ADM terminals.

When the cursor is on the command column, pressing any letter key from A to W will immediately move the cursor to that letter in the column. Pressing the down arrow key (or the LINEFEED key on the ADM) will move the cursor down one line. And pressing the up arrow key (or the HOME key on the ADM) will move it up one line. (Note these two exceptions:

the down arrow or LINEFEED will scroll the text forward if the cursor is on the W, the up arrow (or HOME) will scroll the text backward if the cursor is on the A. These exceptions are explained below.)

The TAB Key

Pressing the TAB key (CTRL-I on the ADM) will move the cursor forward to the beginning of the next word or number in the current line. If you reach the end of the current line, the cursor will move until it is under the beginning of a word or number in a line above the current line. Spaces will be appended to the end of the line in this case, altering the current file.

The RETURN key

If the cursor is on the command column, pressing RETURN will have no effect.

If the cursor is located anywhere to the right of the command column except at the end of the line, pressing RETURN will return the cursor to the command column.

If the cursor is located at the right end of a line, pressing RETURN will result in the insertion of a new, blank, line in the current file. This is explained further below.

SCROLLING THE TEXT

When you first enter the Screen Editor, the first 23 lines of the current file will be visible on the screen. There are several ways in which you can "scroll" the text to see other segments of the file. Scrolling the text does not change the current file.

Moving Forward to the Next Segment of Text

If the cursor is on the W letter in the command column (as it is when you first enter the Screen Editor), press the down arrow or LINEFEED and the next 23 lines of the file will appear on the screen.

The letters A through W will remain in the command column, but they will now be associated with different lines of

text. The current line number will always be displayed on the status line at the bottom of the screen.

Moving Back to the Previous Segment of Text

If the cursor is on the A letter in the command column, press the up arrow or the HOME key and the previous 23 lines of text will appear on the screen.

Moving the Cursor to a Specific Line Number

If the cursor is on the command column, typing a line number and pressing RETURN will automatically move the cursor to that line of text. The file will scroll, if necessary, to place the segment of the file containing that line on the screen. As you type in the line number, it will appear in place of the status line, at the bottom of the screen.

Moving the Cursor to the End of the File

If the cursor is on the command columm, typing a dollar sign ($) will move the cursor to the last line of the file. The file will scroll to the last segment of the file, if necessary.

Moving a Line to the Top of the Screen

If the cursor is on the command column, typing the two characters, period and T (".T "or ".t"), will scroll the text so that the line where the cursor is located, or current line, will move to the top of the screen.

Moving a Line to the Bottom of the Screen

If the cursor is on the command column, typing the two characters, period and B (".B" or ".b"), will scroll the text so that the current line will move to the bottom of the screen.

Moving a Line to the Center of the Screen

If the cursor is on the command column, typing the two characters period and C (".C" or ".c") will scroll the text so that the current line will move to the center of the

screen.

Locating a Particular "String" of Text

Sometimes you will want to locate a string (a particular word or other combination of characters) wherever it appears in your text.

To locate the first occurrence of a string after the current cursor position, you first type the slash symbol (/) while the cursor is on the command column. That moves the cursor down to the status line. Then you type in the "search string". Pay close attention to upper and lower case letters since a string will not be recognized if it has characters with different cases from those that you type. As you type in the search string, it will appear at the bottom of the screen. (NOTE: You may "erase" a typing error in the search string with the RUBOUT or DELETE key.) When you are finished typing the search string, press RETURN and the cursor will move to the first occurrence of the search string in the text. To search for the next occurrence of the search string, press LINEFEED; each additional occurrence of the search string in the file can be located in this way. (NOTE: LINEFEED is used this way only when the cursor is located within the text.)

If the string does not exist in the current file, the cursor will return to its previous position in the command column and a message will appear on the status line.

To search backwards for the string from the current cursor position, type the back-slash ( ) instead of the slash (/).

The search string will be stored in computer memory and can be used to search through more than one file. It will be erased when it is replaced by another search string.

CREATING AND EDITING TEXT

The First Line of Text

When you first load the system and type SED, the current file will be "empty" (contain no text). (In minidiskette systems, when you press RETURN after being asked for a filename, the current file will be "empty".) When the current file is empty, the cursor will be located on the A in the command column and the current line number (1) will be indicated on the status line. Press the right arrow (or ESC on the ADM) and move the cursor into the first space to the right of the command column. Whatever printing character you next type will appear exactly where the cursor is located and the cursor will move one character to the right.

When you reach the end of the line, press RETURN. The cursor will move to the beginning of the next blank line. And the status line will indicate the new current line number (2).

When you are finished typing your last new line of text, you will not want to press RETURN. This would insert a new blank line into the text. Instead, press the right arrow (or ESC on the ADM) to return the cursor to the command column.

Inserting a New Line of Text

To insert new lines of text between existing lines, first position the cursor in the command column either before or after the desired location of the new line. Typing a plus (+) will insert a blank line between the current line and the following line (which will move down one line). Or, typing a minus (-) will insert a blank line between the current line (which will move down one line) and the previous line.

In either case, the cursor will move to the first space to the right of the command column. The next character you type will appear on this line. When you get to the end of the line, press RETURN and another blank line will be added to the file after the one you are typing. Succeeding lines will be moved down another line.

When finished, press the right arrow (or ESC on the ADM) to return the cursor to the command column.

Deleting Characters

To delete a single character from the current file, you first position the cursor over the character you want to delete. Then press CTRL-D and the character will be deleted. The characters to the right of the cursor will move one space to the left. If the cursor is at the very end of a line, CTRL-D will delete the "end-of-line". This will merge the following line of text with the current line.

Alternatively, you can position the cursor to the right of the character you want to delete. Pressing RUBOUT or DELETE will then delete the character immediately to the left of the cursor. RUBOUT or DELETE have no effect if the cursor is on the leftmost character of text on the line.

Deleting a Line of Text

If the cursor is on the command column, pressing RUBOUT or DELETE will delete the current line from the current file.

Adding or Changing Characters

The Screen Editor has two modes for changing the text in an existing line: insert and overstrike. Initially the screen editor will be in the insert mode. To enter the overstrike mode, press CTRL-O. To re-enter the insert mode, press CTRL-A.

Use the insert mode to add text to a line. First, move the cursor to the location within the text where you wish to make an addition. The next character you type will appear exactly in that spot. The cursor and the existing characters under and to the right of it will move to the right as you add text. You can add as many characters as needed.

Use the overstrike mode to change a character. First, move the cursor to the location within the text where you wish to make the change. The next character you type will replace the character under the cursor. The cursor will move one character to the right.

Dividing a Line of Text

If your current line becomes too long, pressing CTRL-B will "break" the line at a location between the cursor position and the character immediately to the left of the cursor. The

character under the cursor and characters to the right of the cursor will become the text of a new line in the current file. All succeeding lines of text in the file will be moved down one line.

FILE MANAGEMENT AND PERFORMANCE COMMANDS

The Screen Editor includes several commands similar to the monitor commands NEW, OLD, SAVE, REPLACE, CATALOG, RUN, PLAY, and UNSAVE. You may use any of them when the cursor is on the command column.

Unlike the standard monitor commands, which are words or three letter abbreviations, the Screen Editor commands are designed to minimize your typing. One or two characters initiate all commands.

All Screen Editor commands begin with a period (.) followed by a single letter which may be typed in upper or lower case.

.E (Exit) terminates Screen Editor operation and restores the standa monitor (maxidiskette systems only). The current file under the Screen Editor will remain the current file under the monitor.

.S (Status) lists the status of the diskette in the right-hand drive. This is very similar to the CATALOG monitor command. The text of the current file will be temporarily erased from the screen and a catalog of files will appear along with the file length in words of each file.

Typing any character on the terminal will erase the catalog and restore the text display.

The current file will not be altered by these operations.

.O (Old) combines the functions of the OLD and NEW monitor commands. After you type .O, the words "file name?" will appear on the status line. Type in the name of the file which you want to become the current file, then press RETURN. In this case, .O acts like the OLD monitor command. If you do not type a file name and just press RETURN, you will be given an empty current file containing no text. In this case .O acts like the NEW monitor command.

Only a text file can become the current file under the Screen Editor; a data or compiled file cannot become

the current file.

You can "cancel" the .O command by pressing RUBOUT or DELETE before you press RETURN.

.R (Replace) combines the functions of the REPLACE and SAVE monitor commands.

After you type .R, the words "file name?" will appear on the status line. Type in the name of the file which you want to replace or save and press RETURN. If you do not type a file name and just press RETURN, the name of the current file will be used.

The Screen Editor does not distinguish between replacing an old file and saving a new one.
If a file already exists on the user diskette with the indicated name, it will be replaced. If no file exists on the diskette with the indicated name, one will be created.

You can cancel the .R command by pressing RUBOUT or DELETE before you press RETURN.

.U (Unsave) will unsave a file on the user diskette. After you type .U, the words "file name?" will appear on the status line. Type in the name of the file you want to unsave and press RETURN. If a file with that name exists on your user diskette, it will be unsaved. .If the file does not exist, a message will appear on the status line.

You can cancel the .U command by pressing RUBOUT or DELETE before you press RETURN.

.P (Play): If you are using the Screen Editor with the SCRIPT system, .P will play the current file.

The Synclavier II operating system will replace the screen editor in computer memory and the composition in the current file will be compiled and placed in the memory recorder.

(Note that compositions cannot be compiled under the Screen Editor, nor can compiled compositions be played.)

Then, if you press S on the terminal, the Screen Editor will be restored in computer memory, with the same current file as before.

On the other hand, if you press any of the keys that activate

the reverse compiler, the Screen Editor will be restored but the converted sequence will replace the previous current file.

.X (eXecute): If you are using the Screen Editor with either the MAX/XPL or XPL operating system, .X will "run" the current file.

(Note that programs cannot be compiled nor can compiled programs run from the Screen Editor.)

MANIPULATING BLOCKS OF TEXT

"Marking" a Block of Lines

Before a block of lines can be moved or copied onto the user diskette, or deleted from the current file, it must first be "marked" with periods (.).

First, position the cursor over a letter in the command column which is to the left of either the first or last line of text in the block. Then press the period key (.) twice. A period will appear just to the right of the letter on the command column.

Next, position the cursor over the letter corresponding to the last or first line of text in the block. Periods will appear just to the right of all of the letters on the command column between the previous and current location of the cursor. All of these lines of text are now marked.

To remove the marks from the lines, press the period key four times. When you type the first two periods, the marks will be removed from all lines but the one beside the cursor. When you type the second two periods, the marks will be removed from that line as well.

The Commands

Once the lines are marked, you can use the following commands. Like all commands, they begin with a period and are used when the cursor is in the command column.

.D deletes all of the marked lines from the current file.

.W writes a copy of the marked lines to a file on the user diskette. The marked lines will not be deleted, nor will

the marks disappear. The words "file name?" will appear on the status line. Type in the name of the file you want to use and press RETURN. A copy of the marked lines will replace the contents of that file. If no file exists on your user diskette with that name, a new file will be created.

The .W command can be cancelled by pressing RUBOUT or DELETE before pressing RETURN.

.M "moves" the marked lines to a file on the user diskette. This command combines the write (.W) and delete (.D) command. The words "file name?" will appear on the status line. Type in the name of the file you want to use and press RETURN. The marked lines will replace the contents of that file. If no file exists on your user diskette with that name, a new file will be created. The marked lines will then be deleted from the current file.

THE .M command can be cancelled by pressing RUBOUT or DELETE before pressing RETURN.

Inserting Blocks of Text

Two additional commands can be used to insert a block of text located in a file on the user diskette into the current file. Like all commands, they begin with a period (.) and are used when the cursor is in the command column.

.+ inserts an entire text file between the current line the subsequent line (which will be moved down to follow the inserted text). The words "file name?" will appear on the status line. Type in the name of the file you want to insert and press RETURN.

The .+ command can be canceled by pressing RUBOUT or DELETE before you press RETURN.

.- inserts an entire text file between the current line (which will be moved down to follow the inserted text) and the previous line. The words "file name?" will appear on the status line. Type in the name of the file you want to insert and press RETURN.

The .- command can be canceled by pressing RUBOUT or DELETE before you press RETURN.

SCREEN EDITOR SUMMARY

ANY CURSOR LOCATION

VT100	ADM	
→	ESC	moves forward 1 character, wrapping back to command column 11 at end of line
←	CTRL-H	moves back 1 character, wrapping to end of line if at command column
TAB	CTRL-I	moves forward 1 word; at end of line gives blank space
CTRL-O	CTRL-O	sets overstrike mode
CTRL-A	CTRL-A	sets insert mode
↓		moves down 1 line
↑		moves up 1 line

CURSOR IN COMMAND COLUMN

A-W	A-W	moves to specified line
↓ or LINEFEED	LINEFEED	if at bottom of screen, moves down 1 screen; else down 1 line
↑	HOME	if at top of screen, moves up 1 screen; else up 1 line
$	$	moves to last line in file
.T	.T	puts current line at top of screen
.B	.B	puts current line at bottom of screen
.C	.C	puts current line at center of screen
<n>	<n>	moves to line number <n> (follow with RETURN)
/<string>	/<string>	searches forward for <string> (follow with RETU
\<string>	\<string>	searches backward for <string> (follow with RET

VT100	ADM	
DELETE	RUB	removes current line
+	+	appends blank line after current line
-	-	inserts blank line before current line
.+	.+	appends file after current line
.-	.-	inserts file before current line
..	..	marks start of text to write to a file
.W	.W	copies marked lines out to a file
.D	.D	deletes marked lines
.M	.M	copies and deletes marked lines
.O	.O	reads in an old file (no argument creates new file)
.R	.R	saves or replaces current file
.U	.U	unsaves a file
.X	.X	runs current file (XPL/4 system)
.P	.P	plays current file (SCRIPT system)
.S	.S	prints out catalog of drive 1 (right-hand)
.E	.E	exits Screen Editor; restores monitor; does not erase current file

CURSOR IN TEXT

VT100	ADM	
RETURN	RETURN	if at end of line, appends a blank line; else moves to command margin
DELETE	RUB	deletes character before cursor
CTRL-D	CTRL-D	deletes character at cursor; at end of line, appends next line
CTRL-B	CTRL-B	breaks line; inserts end of line
LINEFEED	LINEFEED	finds next occurrence of <string> last sought
others	others	inserted or overstruck, according to current mode

WHEN A FILE NAME IS ASKED FOR:

response		result
RETURN	RETURN	uses default file name (last used on .O or .R)
DELETE	RUB	ignores command
<filename>	<filename>	uses the name (follow with RETURN)