USING THE UTILITY PROGRAMS

July, 1984

PREFACE

This manual contains instructions for using the Utility Programs and
the Winchester Installation Program. You will learn how to

- format your tape cartridge or floppy diskettes using
  the FORMCOPY program;
- copy system and user files using the FORMCOPY program;
- copy system files onto your Winchester using the WINCHESTER
  INSTALLATION Program;
- reorganize your subcatalogs and files using the SHUFFLE program;
- reconfigure your operating system using the CONFIGUR program;
- print out permanent copies of your XPL programs using the LISTING
  program.

INTRODUCTION

On the floppy diskette labeled "Utility Programs" there are four
Utility Programs: FORMCOPY, CONFIGUR, SHUFFLE and LISTING. Users
with Winchester Disk systems will also receive a floppy diskette
labeled "Winchester Installation Program."

FORMCOPY

FORMCOPY formats floppy diskettes or tape cartridges and
copies files from any storage device in the system to any
other. All files on a diskette, all files in a subcatalog,
or individual files can be copied.

SHUFFLE

SHUFFLE reorganizes the contents of a storage device to make
room for more files. Spaces between files and/or subcatalogs
are moved to the end of the storage device. Any storage
device, except the Tape Cartridge, can be shuffled. The
current catalog can also be shuffled.

CONFIGUR

CONFIGUR tells the operating system about the physical setup
of the computer installation. Memory size, terminal and
printer type, processor type, storage device type, real-time
clock speed and the presence or absence of musical interfaces
are recorded within the operating system by the CONFIGUR
program. You can configure the Winchester Disk and any
system diskettes located in any attached drive.

LISTING

LISTING prints out permanent listings of XPL programs from
any storage device except the Tape Drive. You can also print
out subcatalog files. LISTING supports several printers.

WINCHESTER INSTALLATION

WINCHESTER INSTALLATION formats Winchester Disks and copies
system files into the top-level catalog of a Winchester. It
is used primarily to install software updates.

Device Identifiers

All the Utility Programs have quick access to any storage device in the system except the Tape Drive (which can only be accessed by FORMCOPY). When you run a Utility Program, you can specify the device or devices involved using these identifiers:

F0   Floppy diskette in drive-0 (main or left-hand drive)
F1   Floppy diskette in drive-1 (auxiliary or right-hand drive)
R0   Minidiskette in remote drive-0
R1   Minidiskette in remote drive-1
W0   Winchester Disk subsystem
T0   Tape Drive subsystem
CC   Current catalog

You will note that these are the same as the device identifiers used in Monitor commands with the addition of TO (accessed only with FORMCOPY) and CC (accessed by all Utility Programs).

Running the Utility Programs

The Utility Programs come on a special Utility Programs diskette. From a Winchester system, remove the Bootload diskette from the main or left-hand diskette drive and replace it with the Utility diskette. From a floppy diskette dual drive system, keep an XPL system diskette in the left-hand drive and place the Utility Programs diskette into the right-hand drive. (NOTE: You cannot run any Utility Program from a SCRIPT system diskette.)

To use a program in the dual drive system, type

    OLD <utility filename>; RUN

To use a program in the Winchester system, type

    OLD <utility filename>/F0; RUN

There is room on certain system floppy diskettes (i.e., maxidiskettes and double density minidiskettes) for storage of at least some of the Utility Programs. To store a Utility Program onto a system floppy, type

    OLD <utility filename>; SAVE/F0

Then to use the program stored on the system diskette, type

    OLD <utility filename>/F0; RUN

Similarly, any or all Utility Programs can be stored on the Winchester Disk. To do so, type

OLD <utility filename>/F0; SAVE

Then to run it, type

OLD <utility filename>; RUN

To perform any Utility Program on the files in a subcatalog, 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 entered will be the current catalog while the Utility Program will be the current file.

The commands can be entered on one line, as follows:

OLD :<utility filename>; RUN

Here the Utility Program becomes the current file while the current catalog remains the same.

Once the command RUN has been entered, instructions for operating the Utility Program will appear on the terminal screen. Each program offers options, although you will often use the default options.

FORMCOPY

+--+
| CAUTION: Carelessly used, FORMCOPY can obliterate valued |
| information very quickly. Please read the following |
| instructions very carefully before using. |
+--+

The FORMCOPY program has two separate functions: formatting and
copying.

Formatting prepares the magnetic media on a floppy diskette,
Winchester Disk or Tape Cartridge for storage of data. When you use
FORMCOPY for formatting, you will specify whether the device will be
used for XPL or CP/M. (All Synclavier diskettes are formatted for
XPL). In the case of minidiskettes, you will further specify whether
the diskette will be used in a single or double drive. Note that if
you format an old diskette or tape cartridge, you will erase any
previously stored information.

+--+
| CAUTION: Do NOT use FORMCOPY to format your Winchester Disk. |
| Winchester formatting is done here at N. E. D. Any future |
| formatting should be done using the Winchester Installation |
| Program. |
+--+

In addition to formatting, FORMCOPY copies files and subcatalogs to
and from any storage device in the system. You can copy from left-
to right-hand drive, from Winchester to floppy, from main drive to
remote, from tape cartrige to current catalog, etc. You can copy a
single file, a series of selected files, an entire subcatalog or an
entire floppy from one device to another. You can also copy any of
the above into a subcatalog.

The Main Menu

When FORMCOPY is run, the terminal screen displays a menu listing
options and commands. Across the top of the screen is a set of basic
instructions for using FORMCOPY. To the left is a list of the valid
commands and to the right side of the screen is the list of options.

First, note that the default mode is Copy. This is because you will
mostly use FORMCOPY for copying files and making back-up diskettes.

The list of commands on the left side of the screen varies depending on the mode. For copying, the list of commands is:

    S   View source catalog
    D   View destination catalog
    I   Interchange source and destination
    Q   Quit (return to operating system)

    RETURN   Initiates copy

When you press the terminal key corresponding to these commands, the operation described next to the key name will be performed. For example, pressing the S key will bring up the source catalog or catalog from which files are to be copied. Pressing the D key will bring up the destination catalog or catalog to which files are to be copied.

When you press RETURN, you will always be asked to verify your selections by typing "OK" and pressing RETURN again. This is to prevent a premature program initiation.

At any time while this menu is on the screen, you can return to the Monitor by typing Q (for Quit) or by pressing the BREAK key.

Listed on the right side of the screen are options with default choices. For dual drive systems, the default choices are

    Mode: Copy

    Source: F1 (Rightmost floppy)
    Destination: F0 (Leftmost floppy)

    Select: No
    Alphabetic: No
    Erase: No

    Density:
    Disk format:

For Winchester systems, the default choices are the same except for Source, which is W0 (or CC if you are in a subcatalog).

You change the default options by first moving the cursor to the option to be changed and then pressing the space bar until the desired option appears.

Mode Options

The MODE option specifies the mode of operation. If you choose the default option, COPY, files on the source device will be copied onto the destination device when you press the RETURN key.

FORMAT AND COPY, which appears if you press the space bar when the cursor is on the MODE option, will cause the destination device to be formatted before the source files are copied to the destination device.

Pressing the space bar again will bring up the FORMAT mode which means that the destination device will be formatted only.

Pressing the space bar one more time will return COPY to the mode option.

Notice that when you change the MODE option, the commands on the left side of the screen change also. That is, if you select FORMAT as your mode of operation, the list of valid commands will include only

   D

   Q

   RETURN

since the S and I commands are irrelevant in this mode.

Changing this option also changes some of the other options. For example, when you select the FORMAT only option, the SOURCE option in the second set of options will not appear nor will the third set of options which define COPY parameters. On the other hand, the last set of options defining FORMAT parameters will not appear when you select the COPY only mode.

Source and Destination Devices

The next two options specify the SOURCE and DESTINATION devices. You can choose a SOURCE device only when you are using the copy or format and copy modes of operation. You select a DESTINATION device for all operations. For dual drive systems, the default SOURCE selection is F1 (auxiliary or right-hand floppy); for Winchesters it is WO if you are in the top-level catalog, or CC in you are in a subcatalog. The default DESTINATION for both systems is FO (main or left-hand floppy).

Winchester users with Tape Cartridge Subsystem will change the DESTINATION option to TO to copy files for archival purposes. To recall files from the Tape Cartridge, change the SOURCE mode to TO and the DESTINATION to CC or WO. (This can only be done if the system has been configured for a Tape Cartridge.

Notice that the Command Key I listed on the left side of the screen can be used for an interchange of SOURCE and DESTINATION devices.

Copying Parameters

The SELECT option allows you to select specific files to be copied.
If you choose YES and press RETURN, type OK, and press RETURN again,
a new menu will appear on the screen. For example, if you are
copying from F1 to F0, you will see at the top of the menu

Copy from: F1 (Rightmost floppy)
Copying to: F0 (Leftmost floppy)

SELECT option: Use the cursor to move over the file. Press the space
bar to select or deselect a file to copy. Press RETURN to initiate
the copy. Press Q to abort the copy operation. Selected files are
marked with a >.

Below this, the source catalog directory will be displayed on the
screen with a vertical line (¦) in front of each filename. If you
don't want a file copied, skip over the filename by pressing the
right arrow key. If you do want a file copied, press the spacebar.
The ¦ in front of the file will change to a > as you mark it. If you
change your mind, go backward using the left arrow key, press the
spacebar again and the file will be unmarked. In fact, you can move
around the directory in any way using the arrow keys and the PF1 or
HOME keys.

If the selected file is already stored on the destination device, you
will be so informed during the copy operation. You will then have
the option of replacing the destination version of the file with the
source version or keeping the original destination version.

If you select YES for the ALPHABETIC option, the files will be copied
in alphabetical order. If you leave the option at NO, they will be
copied in the same order as they occur on the source device.

If you change the third option, ERASE, from NO to YES, then the
entire destination catalog will be erased before any copy operation
commences. This means that any files stored on the destination
device will be destroyed.

+--+
¦ CAUTION: If you are copying files into the top-level catalog   ¦
¦ on the Winchester, the ERASE option should be set to NO.   ¦
¦ Otherwise you will erase the top-level catalog and you will be   ¦
¦ unable to run your system.   ¦
+--+

A special safety prompt is built into this option. When you press
the spacebar to select YES, you will be asked whether you really want
to erase the destination files. Type Y for yes or N for No. The OK
prompt that appears when you press RETURN to initiate the copying
operation gives you a second chance to review this option.

Formatting Parameters

The last group of options specifies formatting parameters. The
DENSITY option, SINGLE or DOUBLE, must be set to the density of the
floppy minidiskette being formatted. For maxidiskette drives, the
parameter will be ignored.

The DISK FORMAT option allows you to choose between formatting for
XPL or for CP/M. You will always choose XPL except when creating
diskettes for use with the CP/M option.

Formcopy Procedure

Once you initiate the selected operation, the screen will clear and
information concerning the procedure will appear.

For example, if you have selected the formatting mode, FORMCOPY will
tell you as it begins the formatting pass, then the test pass, and
when formatting is complete. If the diskette being formatting is
defective, FORMCOPY will print details about the exact address of the
defect and warn you not to use the diskette.

If you are copying, and a file or subcatalog will not fit on the
destination device, FORMCOPY will give you the option of continuing
with a new tape or diskette or quitting the operation. If you elect
to continue copying with a new diskette or tape, press RETURN. The
mode, erase and density options will appear in the upper right-hand
corner of the Copy Menu.

For example, if you were copying files from CC to TO, you would see

```
Copying to:    TO                      | Copying file: <filename>
Copying from:  CC <catalog name>       | Mode:
_____| Erase:
                                        | Density:
Files copied:                          _____

<filename>  <filename>  <filename>
```

_____

    Insert the next disk/tape into FO (Leftmost floppy). Then verify
    selected modes. Change modes with space bar. Press RETURN to
    continue or Q to quit.

_____

You would need to change the mode and density options, for example,
if you had been using the copy only mode to copy onto a formatted
diskette, but needed to continue copying onto an unformatted
diskette.

SHUFFLE

When you store files, empty sectors often occur between files. You
may get an error message saying there is no more room on the floppy
diskette or Winchester Disk or within a subcatalog, when in fact
there are more than enough empty sectors scattered throughout the
device. The SHUFFLE program is used to pack files and subcatalogs
together and to collect the empty sectors into a group at the end of
the floppy diskette, Winchester Disk or subcatalog.

The files on any storage device connected to the computer, except the
Tape Drive, can be shuffled. You can also rearrange the files so
that specified files are collected into adjacent areas.

The Menu

When you run the SHUFFLE program, a menu with a list of options will
appear on the screen. Users with dual diskette drives will see

        GO   to SHUFFLE F1 (Rightmost floppy)
        DEV   to change Device selection
        COL   to enter a list of filenames to be COLLECTED
        CAT   to CATALOG F1 (Rightmost floppy)
        <RETURN>   to terminate SHUFFLE PROGRAM

Winchester users will see the same menu, except that the default for
GO and CAT is WO or CC, depending upon whether the you are in the
top-level catalog or a subcatalog.

If you type GO at this point, the SHUFFLE program will begin to
rearrange all the files on the default device. If you want to change
the default device or select specific files to be shuffled, you will
need to choose options first.

Type DEV to change the storage device that you want shuffled. When
you press RETURN, a list of the possible storage devices (as outlined
on page 6) will appear: Type the selected device, press RETURN and
the main menu will reappear.

If you want to make a specific arrangement of files, that is, place
certain files next to certain other files, type COL for the Collect
Option. The menu will be replaced with instructions for building a
list of files to be rearranged. Type in the filenames as you want
them to be arranged and press RETURN. The menu will reappear. If
you are not sure of the filenames in the catalog or subcatalog to be
shuffled, type CAT and the directory will appear on the terminal
screen.

NOTE: The length of time needed for the shuffle will approximately
double with this option.

Shuffle procedure

After the options are selected, type GO to initiate the shuffle. As
the shuffle proceeds, each file being shuffled will be listed on the
terminal screen. Note that it may take between 15 to 20 minutes to
complete a shuffle on the Winchester Winchester Disk.

```
+--------------------------------------------------------------------+
|  CAUTION:  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 result in lost data.        |
+--------------------------------------------------------------------+
```

After the SHUFFLE is completed, press RETURN to terminate the SHUFFLE
program and return to the Monitor.

CONFIGUR

All operating systems must be customized for the particular set of
hardware in the Synclavier (R) Digital Music System. This
customizing is called configuring the system and is initially
performed here at New England Digital with the CONFIGUR program. You
also have a copy of this program so that you can reconfigure your
system diskette or Winchester Disk whenever you change or expand your
options.

For example, if you decide to add a printer or change the type of
terminal you are using or add memory to the computer, you will use
the CONFIGUR program to tell the operating system about these
changes.

The CONFIGUR program is divided into two levels: basic and
comprehensive. The basic level allows you to configure a system
diskette placed in the main or left-hand drive for the amount of
memory in the computer and the type of terminal and printer, if any,
attached to it. The comprehensive level allows you to configure the
Winchester Disk or a system diskette placed in any device in the
system. In addition to the basic items, you can configure for
several computer options and whether or not you have a musical
interface.

```
+--------------------------------------------------------------------+
|                                                                    |
|   WARNING:  Certain wrong responses in the configuration process   |
|   can make a system diskette incapable of loading the computer.    |
|   Please read the following carefully and use care when running    |
|   the CONFIGUR program.                                            |
|                                                                    |
+--------------------------------------------------------------------+
```

To run the basic level of the CONFIGUR program, recall the program in
the usual way, insert the system diskette to be configured into the
main or left-hand drive and press RETURN. Do not remove this
diskette until so directed.

Basic level of CONFIGUR

After you press RETURN, the current configuration of the system
diskette in the left-hand drive in terms of memory size, terminal
type and printer type will be printed on the terminal screen.

When you change these parameters, keep the this information in mind:

1. MEMORY   There are 8K words of memory for each M8K board
                 and 32K words for each M32K board installed in
                 slots 1 through 7 in the computer. Make sure
                 the memory configuration matches the memory
                 that you actually have. NOTE: If you have two
                 32K boards, you must specify 60K or less, not
                 64K. The system does not recognize 64K.

```
+----------------------------------------------------------------------+
|                                                                      |
|   CAUTION: If you specify more memory than you actually              |
|   have, you will not be able to load the system.                     |
|                                                                      |
+----------------------------------------------------------------------+
```

2. TERMINAL   The terminal type must be the same as the
                 terminal actually attached to the TERMINAL port
                 or garbage will appear on the screen
                 and the Screen Editor will not function correctly.

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

To change any parameter, type the number of the option to be changed
and answer the questions that come up on the screen. If you type 1,
for example, you will be reminded of memory size currently specified
and asked how much memory you want to reconfigure for. Type the
number 40 to configure for 40K words or the number 56 to configure
for 56K. Press RETURN to return to the main menu.

If you type 2 for terminal or 3 for printer, you will again be
reminded of current configuration. There will also be a list of
valid terminals or printers and you will be asked to type in the
number associated with your new terminal or printer.

If you make an error in any of these three configurations, type R
while at the main menu to recover your original configuration.

If you type L while at the main menu, you will be asked whether you
want to be in COMPREHENSIVE level. Type Y for Yes or N for No.

Press RETURN when you have finished and then type STOP to return to
the Monitor.

Comprehensive Level of CONFIGUR

You can use the comprehensive configuration level by typing GO and pressing RETURN on the first menu or by typing L followed by Y on the Basic Level. You must be in the comprensive level to reconfigure the Winchester operating system and/or a system diskette in F1 or a remote drive.

After you type GO and press RETURN, CONFIGUR will ask you the enter the location of the system you wish to configure. Type FO, F1, RO, R1, WO or press RETURN to configure the operating system in the default device (FO for a dual diskette drive; WO for a Winchester).

After you have made your selection and pressed RETURN, you will see the current configuration of your system on the terminal screen. In addition to MEMORY size, TERMINAL and PRINTER type, you will see

    4. PROCESSOR type
    5. Computer Options:
         Multiply/Divide unit
         DMA controller
         Real Time Clock speed
         Remote Minidiskette interface
         Tape Drive Subsystem
    6. Music related interfaces
         D130 Clavier interface
         D160 Synthesizer interface
    7. System storage device

You should keep this information in mind when you change these parameters:

4. PROCESSOR	This parameter is set at the factory; it is unlikely that you will have to change it.
5. 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 if you're setting up timing loops that deal with screen/user interaction. Normal speed for Synclavier (R) systems it is 200 Hz.
6. Music Interfaces	These are yes or no options indicating presence or absence of interface boards. If you type Y for the D130 Clavier interface, you will be further asked whether your keyboard senses velocity and pressure.

7. Storage   This option specifies which system storage devices
   Device Type   are attached to the system. If you are adding one
                 or more Winchester Disk drives, you will have to
                 specify the number and size of the each. For a
                 changed diskette drive, you will have to specify
                 whether it is single or double density.

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

Again, to change any configuration, type the number associated with
that option and then answer the questions that appear.

As in the basic level, if you make an error you can correct it by
typing R to recover your original configuration.

When you have finished changing the parameters of your system, press
RETURN and the specified device will be reconfigured according to
your new specifications. After reconfiguration is complete, type
STOP to return to the Monitor.

LISTING

To print out listings of XPL source files from any attached storage device, RUN the LISTING program.

The Menu

When you run LISTING, the LISTING menu will appear on the terminal screen. At the top of the menu you will see a list of three command keys:

Q	Quit
RETURN	Initiate Listing
BREAK	Return to Monitor

You can use either the Q or BREAK keys to return to the Monitor from the menu. Additionally, the BREAK key can be used to return to the Monitor even _after_ the RETURN key has initiated the listing.

Below the command keys is a list of ten options, each with a corresponding number and a default value.

0	Current Storage Device
1	Enter "1" to see source CATALOG
2	Printer type
3	All Files will be printed
4	Title for listing
5	Index page WILL NOT be printed
6	Number of copies
7	Page length (lines per page)
8	Page Width
9	Comments start at column

Changing Parameters

0. Pressing 0 allows you to change the storage device from which the source file is to be printed. A new menu will remind you of the current storage device and list the valid choices of other devices. Type in the new device identifier or press RETURN for no change.

1. Pressing 1 brings up the catalog of the specified storage device listed on the terminal screen. Press RETURN to continue.

2. Press 2 to change the type of printer. The default, based on the printer specified in your system configuration, can be overridden by typing one of the following printer types:

   Decwriter
   La-34
   Printronix
   Paper Tiger
   Diablo

   Another option is TER for terminal, if you want the files printed on the terminal.

   Press RETURN when you have set this option.

3. The default setting is that all files of the specified storage device will be printed in the order they occur on the storage device. Type 3 to build a list of the specific files you want printed in the order you want them printed. If you press 3 again and the setting will return to the original all-files-printed option.

   NOTE: This option "toggles" between the two choices. Therefore, do not press RETURN after setting it or you will initiate the LISTING print-out.

4. Type 4 to type in the title for the print-out. The title will be printed on the top of each page of the listing. Any text, up to the limit printed on the screen, can be used.

5. The default setting specifies that no index of the files will be printed. Type 5 to have an index page printed. When the program runs, it will read through all the files being printed and print out the page number where each file begins and the length in words of each file. The index will also include each PROCEDURE, INSERT, WHEN, LIBRARY and MODULE statement along with its line and page numbers.

   NOTE: This, too, is a "toggle" option; do not press RETURN after making your selection or you will initiate the LISTING.

6. Type 6 to specify the number of copies you want printed. Type in any number up to 32,000 and press RETURN.

7. Type 7 to change the page length. Then type in the new length and press RETURN. The new number must, of course, fit into the physical limitations of the paper or printer you are using.

8. Type 8 to change the page width. Then type in the new page width and press RETURN. Again, you must remain within the physical limitations of the paper or printer you are using.

9. You can locate the beginning of your comments in any column. The default column number is 60. To change this, type 9, type in the new column number and press RETURN.

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When you have selected your options and set your parameters, press
RETURN to start the LISTING.

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. A new
page will also be started if $PAGE occurs in a comment.

A listing has automatic formatting by default. To turn off the
automatic formatting, include $NOFORMAT in a comment; to turn it back
on, include $FORMAT in a comment.

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THE WINCHESTER INSTALLATION DISKETTE

The Winchester Installation diskette contains a short program used to
format the Winchester Disk and to install system files onto it. The
diskette is used here at New England Digital to prepare the
Winchester Disk for operation. You will use your copy to install
software updates onto your Winchester Disk and/or to replace
accidental erasures.

```
+------------------------------------------------------------------+
|                                                                  |
|   WARNING:  The Installation diskette has the capability of      |
|   wiping out all the information stored on your Winchester Disk.  |
|   Do NOT attempt to use it without having read this section      |
|   carefully.                                                     |
|                                                                  |
+------------------------------------------------------------------+
```

When you run the Installation program, you will be asked whether or
not you want to format. Formatting, as explained in the FORMCOPY
section, erases all information stored on the Winchester Disk. In
general, you should only format your Winchester after a serious Disk
failure, such as a bad track or a catalog failure. For most
situations, you will skip formatting the Disk and re-install the
files which need to be updated. Of course, if you want to erase
everything and start from scratch, you should format the Disk. To do
this without losing information, first save all user files on floppy
diskettes or on a tape cartridge before using the Installation
diskette.

When you run the Installation diskette, special prompts will step you
through an orderly installation of new system files. Each prompt
will tell you which diskette to insert into the main drive. Prompt
1, for example, calls for installation of the most commonly used
files. The last prompt on the menu is used to install any arbitrary
diskette you want to install in addition to the software updates.

At the end of the installation process, select item 0 on the menu.
The program will then verify consistancy of the system files, print a
message, and stop. You may then use the Winchester Bootload diskette
to load the Monitor and begin operation.