1108 USER'S GUIDE

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PREFACE

Overview of the Manual

The *1108 User's Guide* contains the information you need to begin using the 1108 Artificial Intelligence workstation.

To make it easier for you to help improve documentation quality, there is a form for your comments at the end of this manual.

Organization of the Manual and How to Use It

Apart from the first chapter, this manual is not organized in sequential order. Once you become familiar with your workstation, you can use the *User's Guide* as a short reference manual.

The chapter names describe their contents.

- Chapter 1, Introduction, presents a general overview of the workstation and describes the working environment.

- Chapter 2, Equipment, describes the physical components.

- Chapter 3, Getting Started, contains instructions on such basic operations as turning the workstation on and off, booting, and routine maintenance.

- Chapter 4, File System, describes the local rigid disk file system and contains many of the most frequently used functions.

- Chapter 5, Software Installation, contains step-by-step instructions for loading software, including utility software, microcode, sysouts,

fonts, and Lisp Library modules. There are separate instructions for standalone machines and those connected to networks.

- Chapter 6, System Tools, describes the various tools available for system software installation and diagnosis. It documents the user selections in detail.

- Chapter 7, Input/Output, provides instructions on how to manipulate floppy disks. The section on RS-232 support includes information on connections to external devices, including other computers.

- Chapter 8, Diagnostics, describes a variety of diagnostic programs you can use.

- Chapter 9, MP (Maintenance Panel) Codes, is table of progress and error codes.

In addition to a Glossary and an Index, there are two appendices. Appendix A lists Lisp Library module LCOM files according to their location on floppies. (In the Lyric Release, compiled files have the extension LCOM; in earlier releases, they had the extension DCOM.) Appendix B lists many of the available printer and screen fonts and points to their locations on floppy disks.

Conventions

This manual uses the following conventions:

Literal names of floppy disks are set in italics, as in *Lyric Library Floppy #1*.

Screen prompts are set in boldface italics, as in

Please enter date and time:

User input, defined as anything that has to be typed in an Interlisp Exec window, is set in Terminal 10 typeface and is pushed near the left margin, as in

`(DSKDISPLAY 'OFF)`

Lisp file pathnames show the device in body type and arguments in italics, as in

{ERINYES}<*LISPMANUAL*>*LISP*>*IMINDEX.LCOM;4*

Functions are denoted as such at the right margin and are set in body text with arguments in italics, as in

(SCAVENGEDSKDIRECTORY *VOLUMENAME*   [Function]

Since all the Lisp expressions and functions in this manual are in Interlisp, the reader is instructed either to type them into an Interlisp Exec window or to preface them with the characters *IL:* if any other Exec window is used.

Terminology

This manual makes as few departures from standard, commonly understood terminology as possible. However, there are some exceptions.

The term *sysout,* for instance, has other meanings in non-Lisp environments. Here it is used to mean both a Lisp working environment and a file that contains the ingredients of that environment.

The term *System Tools* refers to a set of software tools designed to make it easier to load and manipulate sysouts. It is also the name of the *logical volume,* or *partition,* the software tools reside in on the local rigid disk.

References to the *rigid disk* and the *local disk* should be considered interchangeable, since both terms refer to the hard disk drive (and the disk itself) mounted inside the processor unit. In many places in the manual, the disk is referenced as the *local rigid disk*.

References

Refer to the *Interlisp-D Reference Manual* and the *Lyric Release Notes* for more detailed descriptions of how to get around in the Xerox Lisp environment. All library modules are described in the *Lisp Library Modules Manual*, except for TEdit and Sketch, which are now in a separate manual called *Documentation Tools*.

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1.   INTRODUCTION

The 1108 Artificial Intelligence workstation uses Xerox hardware and software to support a wide variety of user applications.

Once properly loaded with Xerox software, operation is straightforward. Powering up the 1108 automatically starts Xerox Lisp. Logging out at the end of a session saves the current state of virtual memory until the next time you start Xerox Lisp.

Logging out puts the Xerox 1108 in its base state: a black screen with a small bouncing white rectangle. From the base state, you can resume an earlier Xerox Lisp session, load fresh versions of Xerox Lisp, or run machine diagnostics.

On 1108s with sufficient disk storage, you can maintain more than one Lisp environment on the local disk and support separate software projects under each environment. To switch from one project to another, use the LOGOUT command to leave the first environment and enter the second.

Errors and problems during operation are usually signalled by Maintenance Panel (MP) Codes on the front of the processor. See Chapter 9, MP Codes, for a complete listing.

Workstation Components

Your workstation consists of the following components:

Display Screen: The display is a large format 17" diagonal CRT with a high-resolution bit map.

Processor Unit: The central processor unit (CPU) is in a tan, rectangular box about two feet tall that usually sits on the floor close to the screen and keyboard. The power switch is on the right side of

the Maintenance Panel (MP), located below the floppy disk drive on the front of the central processor. The switch is labeled with a 0 and a 1; 0 is off, 1 is on. Also near the power switch are the boot button (labeled B RESET), the alternate boot button (labeled ALT B), and, on the left side, four red LEDs used to display diagnostic, or MP codes.

Disk Drives: The **Rigid Disk**, also called the local disk or the hard disk, and the **Floppy Disk Drive** are contained in the procesor unit. See Chapter 4 for an explanation of the local disk file system; Chapter 3, Using the 1108, and Chapter 7, Input/Output, contain instructions for using the floppy disk drive.

The 10, 29, 42, or 80 Megabyte local rigid disk is formatted into two or more logical volumes, or partitions. The number and size of these logical volumes depends on the size of the disk, which you can repartition with Xerox utility software.

The SystemTools volume contains software for running diagnostics for the display, keyboard, mouse, floppy disk drive, and Ethernet. With the Lisp System Tool, you can initialize the local disk with Lisp software and switch between Xerox Lisp environments stored on the local disk.

The volumes Lisp, Lisp2, Lisp3, and so on, can each contain a complete Xerox Lisp environment. Although the Xerox 1108 can operate from only one logical volume at a time, you can develop an independent software project on each one.

The LispFiles volume is used for file storage. You can create, read, write, and delete files on LispFiles when Xerox Lisp is running within any Lisp volume.

Keyboard: The Xerox 1108 keyboard is designed to accommodate both programming and word processing applications. The keyboard map at the end of this section establishes the location of many keys needed by Xerox Lisp.

The PROP's key, at the bottom left of the keyboard, functions as the control key, and is frequently labeled CONTROL or EDIT on other keyboards.

Mouse: Either a two-button or a three-button mouse is attached to the keyboard with a thin, insulated wire. It guides a pointer, called the mouse cursor, across the screen. If your system is equipped with a two-button mouse and you find instructions that call for pressing the middle button, press the left and right buttons simultaneously. This "chording" has the same effect as pressing the middle button on a three-button mouse. The mouse comes with a mouse pad, and should always be on the pad when you move it.

Sometimes the mouse cursor changes shape. For instance, it displays an hour glass symbol to tell you to wait while it is working, and a variety of other shapes according to various software modules.

Getting Started

Xerox 1108 workstations come with some software (a Lisp sysout, or working environment, and System Tools) already installed on the rigid disk.

If you discover that software is not installed, or that you cannot load it due to some mishap during either installation or shipping, or if you decide to repartition (erase and restructure) your disk, follow the procedures in Chapter 5, Software Installation.

Turn your workstation on, then press and release the B RESET button on the Maintenance Panel. The Maintenance Panel LEDs will go blank, then display 8888, and, after that, various codes. If you ended a Xerox Lisp session by logging out, that session will resume. If you are running Xerox Lisp for the first time, this boots the most recently installed logical volume. The process takes one to two minutes.

Default Windows

When Xerox Lisp finishes loading, your screen will display three windows: the Exec window (Figure 1) the prompt window (Figure 2) and the Xerox Lisp logo window (Figure 4).
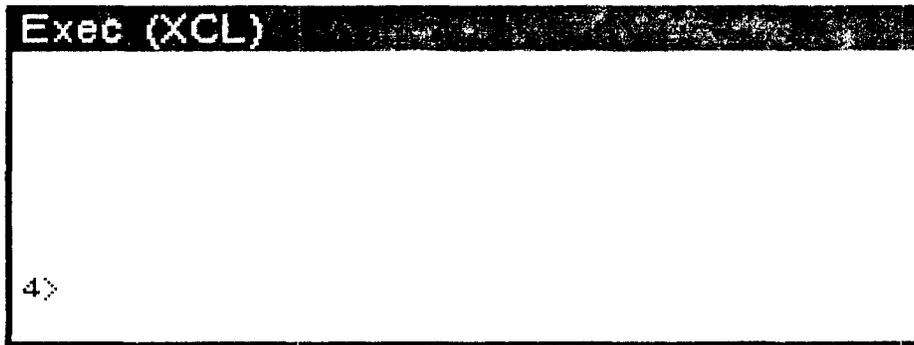
Figure 1. The Exec window

The Exec (executive) window is where you interact with the system by typing in commands and Lisp expressions.

You will also see the prompt window (Figure 2).
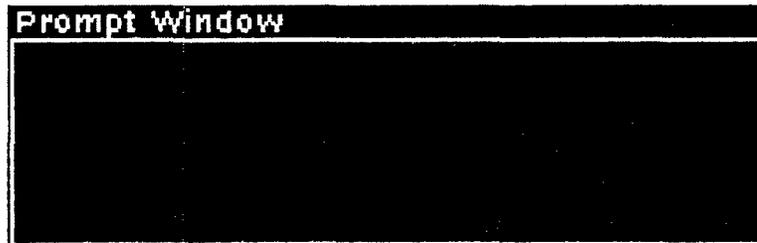
Figure 2. The prompt window

The prompt window displays system messages and, in some applications, prompts you to type a response. For example, if you are not connected to a network that has a time server, or if the 1108 cannot get the time for any other reason, the prompt window will print a message (Figure 3).

Note: Always work in an environment with the correct time set. If the time is not set on your workstation, follow the instructions in Chapter 5, Software Installation.

Figure 3. Prompt window with time message

Figure 4. The Envos Lisp logo window

Alternate Executive Windows

In addition to the Exec window in Figure 1, which is a Xerox Common Lisp (XCL) Exec, current software supports three other Exec windows, for Common Lisp, Interlisp, and Old-Interlisp.

Note: All the Lisp expressions and functions in this manual are in Interlisp. Therefore, you must either type them into an Interlisp Exec window or preface them with the characters *IL:* if you type them in any other Exec window.

To call up another Exec window, press the right mouse button while the mouse cursor is anywhere

in the background of your screen (that is, not in any other window). A menu called the Background Menu will pop up. As you move the mouse cursor around the menu, different items are highlighted. Some menu items have a right-pointing arrow. If you keep the right button pressed and slide the cursor over the arrow, another menu, called a submenu, appears. This can continue for several levels. For instance, to select an Old-Interlisp Exec, duplicate the illustration in Figure 5.
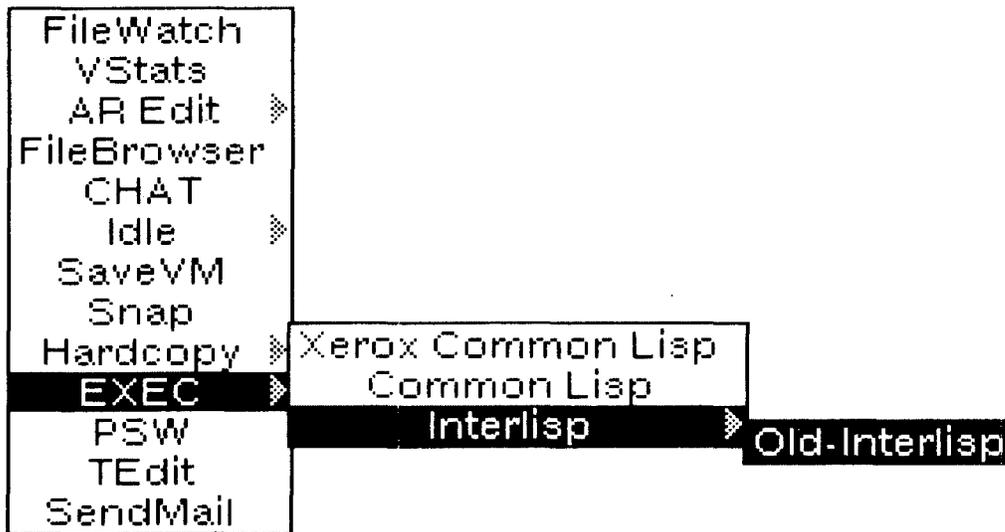
Figure 5. The Background Menu with Old-Interlisp selected

When you release the mouse button, you will be prompted to define an area for the Old-Interlisp Exec window. The selection in Figure 5 produces the Exec window in Figure 6. Exec 3, Exec 4, and so on indicate the order in which these Exec windows were opened on the screen.

Exec 5 (OLD-INTERLISP-T)

`21←`
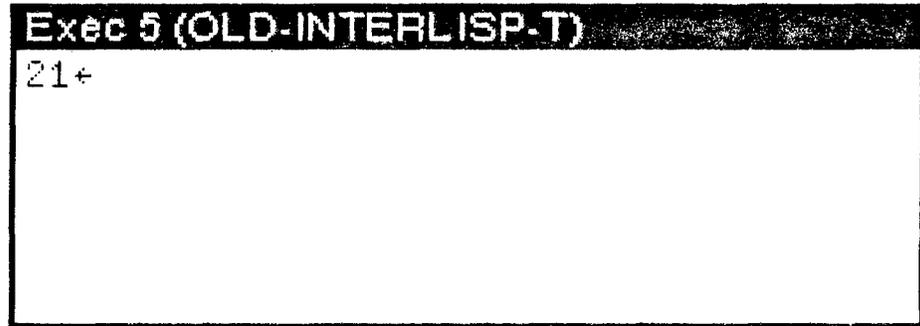
Figure 6. An Old-Interlisp Exec window

Exec 2 (INTERLISP)

`2/43←`
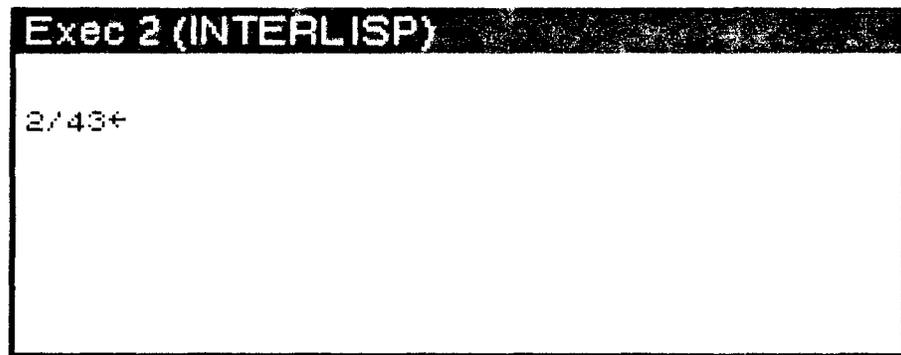
Figure 7. An Interlisp Exec window

If you select a Common Lisp Exec, it will look like
Figure 8 below.

Exec 4 (LISP)

`4/44>`
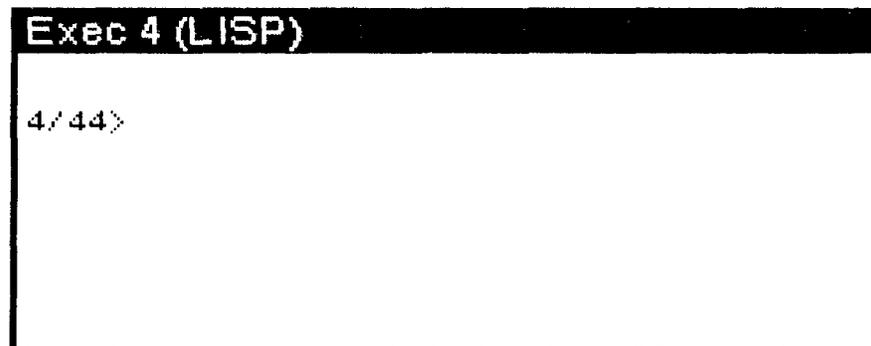
Figure 8. A Common Lisp Exec window

The Lisp Sysout

Each Xerox-supplied software system is recorded on one or more floppy disks. The major system included with your 1108 is the Xerox Lisp sysout. Other systems provided are a software installation utility, diagnostics, and Lisp Library modules such as TEdit, the Lisp text editior, and Sketch, the Xerox Lisp drawing program. (TEdit and Sketch are now described in the *Documentation Tools Manual*.)

A sysout is a file stored on your local disk that contains the initial state of virtual memory. It is like a snapshot of a Lisp environment, containing all the information needed to start the initial state of the Xerox Lisp system. As you run Lisp, virtual memory expands to accommodate newly allocated data structures, compiled code, and so on. Because the sysout is stored on a logical volume on your local disk, virtual memory is limited by the size of the logical volume.

To stop working in the sysout and save the state of your virtual memory (the entire environment plus the software modules you have loaded), log out of Xerox Lisp by typing (LOGOUT) in an Interlisp Exec window.
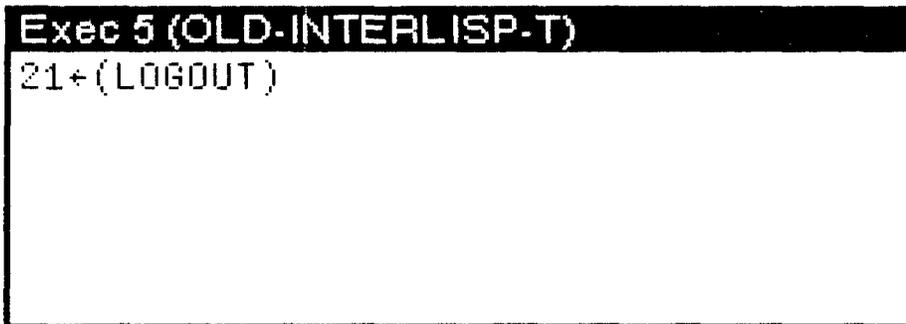
```
Exec 5 (OLD-INTERLISP-T)
21←(LOGOUT)
```

Figure 9. The Exec window during execution of a logout

After you type the closing parenthesis, Xerox Lisp saves the current state of your virtual memory in the logical volume in which you were running. With a normal boot (see Chapter 3), you can resume your

Xerox Lisp session at the point where you logged out.

To produce sysouts that capture the state of your own custom environment so that you can load them on another workstation, use the function SYSOUT (See Chapter 7, Input/Output, and the *Interlisp-D Reference Manual*). For instance, to create a sysout on a set of floppies, type in an Interlisp Exec

```
(SYSOUT '{FLOPPY})
```

The name of the sysout produced by this procedure is LISP.SYSOUT, and the floppies are named *Lisp Sysout #n* (where *n* is a number from 1 to the total number of floppies requred). To create a sysout file named FORMS in directory LISP on Xerox product file server ALPHA, type

```
(SYSOUT '{ALPHA:}<LISP>FORMS.SYSOUT)
```

Installing Sysouts From Floppies

Once the local disk is partitioned, you can install sysouts in logical volumes Lisp, Lisp2, and so on. These can be basic Lisp sysouts, as distributed by Xerox, or extended sysouts, which you can produce from Lisp by copying a sysout from a file server to a floppy set or by typing

```
(SYSOUT '{FLOPPY})
```

To install a sysout from floppies, bring up the Lisp System Tool, which is specifically designed to help you install sysouts, by pressing the left mouse button from the base state. Specify, in the System Tool window, the device you are loading from: **floppy**, the name of the sysout on the floppy, and the name of the local disk volume; then select **Sysin!** See Chapter 5, Software Installation, and Chapter 6, System Tools, for details.

Installing Sysouts From File Servers

If your workstation is connected to a network, you will probably find it more convenient to install a sysout from a file server than from floppies. (A file server is another computer on the network whose job it is to help transfer information between workstations.)

To install a sysout from a file server to a Lisp volume on the local disk, activate the Lisp System Tool by pressing the left mouse button when the Xerox 1108 is in its base state. The System Tool window lets you specify the name of the sysout on the file server and the name of the local disk volume into which the sysout will be installed. You can also install a sysout directly from {DSK}<LispFiles>.

Installing Sysouts From the Local Disk

You can also use the Lisp System Tool to copy one Lisp volume to another. At the completion of this operation, both the source and destination volumes will contain identical versions of Lisp. If you keep a fresh Lisp sysout on its own logical volume on your local disk, you can use the System Tool command, **Copy VMem!**, to load a new sysout whenever you need to. This is much faster than loading from floppies and somewhat faster, as well as more convenient, than loading from a file server. For further details, and for other methods of installing sysouts from the local disk, see Chapter 5, Software Installation and Chapter 6, System Tools.

Starting Lisp

Each Lisp volume on the local disk is a complete and separate Lisp environment. Before running Lisp, you must decide which Lisp volume to start executing. If you want to resume running in the

most recently used Lisp volume, simply push the power switch to the ON position. This is the equivalent of a 0-boot (see Chapter 3, Using the 1108).

When Xerox Lisp is started for the first time on any volume, it may ask you to supply the name of an Init file. An Init file contains information that configures Xerox Lisp for your installation.

For example, the file INIT.NONET-1108 configures Xerox Lisp for an 1108 that is not connected to a file server. To use it, load the Library floppy containing INIT.NONET-1108 into the floppy drive and in response to the prompt for an Init file, type

`{FLOPPY}INIT.NONET-1108`

If you prefer not to specify an Init file, press <RETURN>. After you have run Xerox Lisp once, you will probably want to store an Init file on your local disk, so that it can be loaded automatically when you start a fresh sysout.

Note: You may also be prompted for a PUP host ID number. If you are a standalone user, simply type in any three-digit integer smaller than 255 (decimal). If your workstatation is connected to a PUP network, consult your system administrator.

When initialization finishes, a caret will start blinking in the Exec window, indicating you can now enter expressions and commands.

To terminate a Xerox Lisp session, type

`(LOGOUT)`

in an Interlisp Exec window. This returns the 1108 to its base state.

Loading Xerox Lisp Modules

Xerox supplies two sets of floppies that contain Xerox Lisp software modules: the *Lisp Library*, which contains software supported by Xerox, and *LispUsers*, which contains user-written software not supported by Xerox. (*LispUsers* may not be released at the same time as the *Lisp Library*.) Each module consists of one or more compiled files.

To load selected files from these floppies, start Xerox Lisp from any Lisp volume, insert the floppy containing the file you need into the floppy disk drive, and use the LOAD function to read the file into virtual memory. For instance, typing

```
LOAD '{FLOPPY}GRAPHER.LCOM)
```

in an Interlisp Exec will load the Grapher module into virtual memory; that is, the functions and variables defined in that file will now be defined in Xerox Lisp's virtual memory.

Alternatively, you can connect to the floppy device by typing

```
CONN {FLOPPY}
```

in the Interlisp Exec, followed by

```
(LOAD 'GRAPHER.LCOM)
```

In general, Lisp Library floppies are self-contained, so that all files needed by a module are on the same floppy.

Copying Floppies to a File Server

If your workstation is connected to a file server or a large disk, you may prefer to copy the contents of the floppies to the file server or disk. Then the system can load all the necessary files directly from the server or disk without further intervention. You can copy everything on the floppies or just the

modules you need. The Library module CopyFiles is useful for this purpose.

Maintenance Panel Codes

Two types of codes are displayed in the 4-digit readout on the Maintenance Panel: progress codes and error codes.

Progress codes are displayed on the Maintenance Panel at various stages of booting and initialization. For instance, when you turn the Xerox 1108 on, the lights on the Maintenance Panel cycle from 8888 to 0000 through 0149, 0150, 0199, 0200, and 0500 before displaying 1108, which signals that the workstation is in its normal operating mode. (If your machine has an extended processor board installed, the Maintenance Panel will now display 1109.)

Error codes are traps that freeze or blink the error number on the Maintenance Panel. They are usually serious errors. Codes 9000-9999 indicate a system failure, such as an error in the address space manager, or microcode errors.

When Lisp encounters such an error, it halts, displays an MP code indicating the type of error, and waits for you to take some action. You have a choice of two actions:

(1) you can press the UNDO key, which calls a debugging program, TeleRaid (a Library Module). From TeleRaid, it is possible to inspect the halted machine's state from another (network connected) workstation.

(2) you can press the STOP key, which forces the system to do a Hard Reset. This clears the state of any active computation and restarts all processes from the top.

If the failure persists, please note the MP code and notify your system administrator or Xerox AlSupport. It is also helpful to gather additional information by running TeleRaid.

Refer to Chapter 8, Diagnostics, and Chapter 9, MP Codes, for more information about error codes.

The Ethernet

The Xerox 1108 is equipped with a controller for 10 Megabit Ethernet. This lets the Xerox 1108 access file servers, printer servers, and non-Xerox equipment, as well as other Xerox processors on the network.

Each Xerox 1108 processor has a 48-bit NS host address that uniquely identifies it in every NS network transaction. Xerox Lisp can also use PUP (PARC Universal Packet) protocols to communicate with certain servers. The PUP protocols use 8-bit host numbers unique only within one network. These numbers are not hard-wired in the processor itself, but are usually assigned to each machine by a system administrator. (If a PUP ID Server is running, the PUP host number will be supplied automatically to the Xerox 1108.) If you find that you need a PUP number, please consult your system administrator.

Occasionally, devices on the Ethernet may fail to communicate, due either to a hardware problem with the network or to the network software on some server. Again, if you run into trouble, consult your system administrator.

Copying Files Between Machines

On a network without a file server, it is sometimes convenient to be able to transfer files directly between two Xerox 1108 workstations. The Library

module FTPServer provides such a capability. See FTPServer documentation in the *Lisp Library Modules Manual*.

Floppy Disk Drive

The floppy disk drive is used for loading the Xerox 1108 with Lisp sysouts recorded on floppy disks. The drive is also supported, with a few restrictions, by Xerox Lisp. See Chapter 7, Input/Output, for a complete description.

Xerox Lisp defines a device, {FLOPPY}, which allows file operations to be carried out on floppies. An additional operation, FLOPPY.FORMAT, initializes a floppy for writing. Operations such as LOAD, MAKEFILE, COPYFILE, READ, PRINT, and TCOMPL are all supported.

Advice For Standalone Users

If your 1108 is a standalone system, the following considerations are important:

Back up your critical files. In a very short time you will accumulate a large number of files on your local rigid disk. Back up the most important ones periodically on floppy disks. You can always reload software into your machine with the floppies provided with it. However, if you create a critical file and save it on your rigid disk but not on floppies, you run the risk of losing the file forever in the event of a serious disk failure.

The Library Modules CopyFiles and File Browser are useful for backing up your files. Please consult the *Lisp Library Modules Manual* for information on these modules.

Remember to set the time. Every time you log out of Lisp you lose the time setting. Saving files when

you are working in a sysout without the time set is a risky business. Always enter a (SETTIME) in the Exec window when you first begin a Xerox Lisp session (see Chapter 3, Using the 1108).

1108 Keyboard Map

In addition to the main QWERTY keyboard, the 1108 has three sets of special keys, located to the left, right, and above. Their most basic definitions follow. For further information, check the *Interlisp-D Reference Manual* and the *Lisp Library Module* documentation for any special application programs you may be using.

AGAIN   Repeats the last editing operation performed.

FIND   Prompts you for a string to locate.

SAME   Repeats the last editing operation.

OPEN   Shifts to what can be thought of as a command mode.

DELETE   Deletes selected text.

COPY   Copies selected text to a different location without deleting the original text.

MOVE   Moves selected text from one location to another.

PROP'S   Equivalent to a Control Key: shifts modes for QWERTY keys that have other functions assigned to them.

CENTER   Centers selected text.

BOLD   Changes selected text to **bold face**.

ITALICS   Puts selected text in *italic lettering*.

UNDERLINE   Underlines selected text.

SUPERSCRIPT	Treats selected text as superscript, for example $E = MC^2$.
SUBSCRIPT	Treats selected text as subscript, for example, H_2SO_4.
LARGER/SMALLER	Changes the font size of selected text. If the shift key is pressed, the font is made larger; if the shift key is not pressed, the font is made smaller.
DEFAULTS	Makes whatever font you select the new default font.
SKIP/NEXT	Skips the cursor to the next field to be filled in.
DEF'N/EXPAND	Expands abbreviations in TEdit and macros in SEdit. For instance, typing the word date and pressing this key produces the current date.
HELP	Displays the current font.
MARGINS	Not currently defined.
FONT	Not currently defined.
KEYBOARD	Not currently defined.
UNDO	Undoes the previous edit operation. Cannot be used to undo a series of previous operations, but CAN be used to "undo an undo", that is, to toggle back and forth between undoing and redoing the same operation.
STOP	From the base state, this key boots Lisp. From TeleRaid, it does a hard reset.

CENTER	BOLD	ITALICS	UNDERLINE	SUPER	SUB	LARGER	DEFAULTS
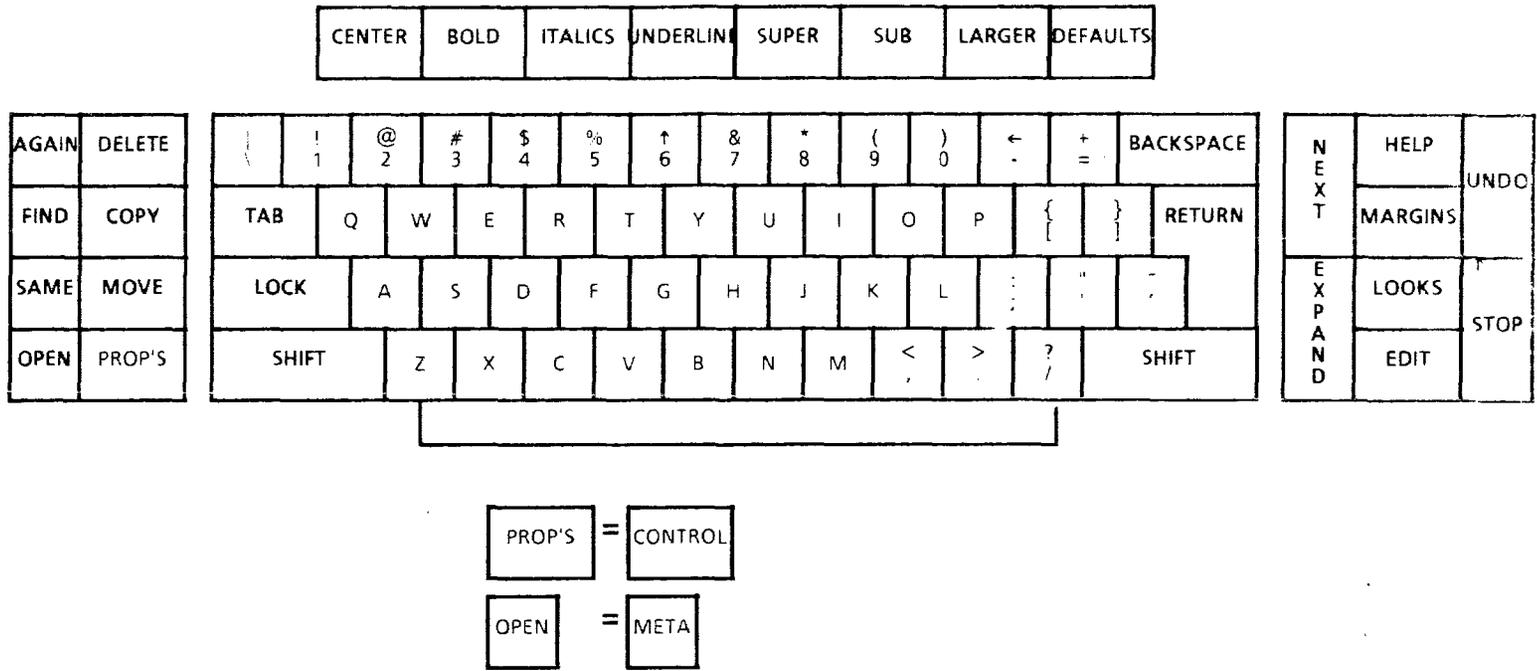
Figure 10. The Xerox 1108 Keyboard

2. EQUIPMENT

Components

The Xerox 1108 is a compact, personal Xerox Lisp workstation. It consists of a processor, display, keyboard, mouse, floppy disk drive, and local rigid disk drive.

Processor

The processor houses a floppy disk drive, a local rigid disk, and six printed circuit boards: I/O processor, Central processor, High Speed I/O processor, Memory Storage, Memory Control, and Options board. Serial ports are located in the rear of the processor.

Some older models that use a 29 Megabyte rigid disk house it in a separate box.

Rigid Disk

The rigid disk has a 10, 29, 42, or 80 megabyte capacity. Depending on size, the disk is divided into two or more logical volumes, or partitions, each of which has a name and length. Instructions for loading each volume are provided with the appropriate software.

Floppy Disk Drive

The floppy disk drive is located on the front of the processor.

To load a floppy disk:

1. Locate the floppy disk drive on your processor. If the door is not open, press the long, narrow bar (with the circle in the center) immediately below the drive.

    (Floppy disks are usually labeled to indicate which side should go in and which side should face up. When you insert the disk correctly, you will hear a click, otherwise it will pop out when you release it.)

2. Press the door down firmly to close it.

To unload a floppy disk:

1. Make sure the red read/write light (circle in the center of the drive door bar) is NOT on.

2. Press the drive door bar.

3. Remove the disk and store it in its jacket.

When storing floppy disks, keep them away from magnets, dust, and heat. Do not bend them. Do not write on their labels with ball-point pens or pencils of any sort. Any of these actions could damage the disk and destroy its contents.

Display

The display is a large format (17" diagonal) CRT with a high resolution bitmap (1024 x 808 pixels). A lever under the left side of the screen controls intensity. The display may be tilted back and forth to maximize comfort and minimize glare.

Keyboard

The keyboard consists of 78 keys, 24 of which are function keys. All 78 keys are unencoded. You can

define the interpretation of any key with the function (KEYACTION keyname actions). The system variable \KEYNAMES lists the mnemonic names of the keys.

The maximum allowed distance between keyboard and processor is approximately eight feet.

Mouse

There are two types of mice are available: three-button or two-button. You can simulate the middle button function on a two-button mouse by "chording" or pressing the right and left buttons at the same time.

Using the Mouse

To do anything that requires the middle plus some other button on a two-button mouse, you can free one (but never both) of the buttons by releasing it while still holding the other one down. (The middle button is still considered to be down, but the freed button is now available to register up or down independently.)

For example, if you are reshaping a window with middle on a three-button mouse and want to switch corners, you press right while still holding down middle, move to the desired corner, then release right. To do the same thing on a two-button mouse, after pressing both left and right to get the equivalent of middle, you release right while still holding left. This "frees" right from the chord. You can now press right, move to the other corner, and release right, all while holding left.

To get the combination left plus right, do not press them down at the same instant.

To adjust the length of time the mouse "waits" for the second button to be pressed, use:

(MOUSECHORDWAIT *MSECS*) [Function]

(MOUSECHORDWAIT) returns the current setting without changing it. (MOUSECHORDWAIT NIL) disables chording. The largest permissible setting is 1872 milliseconds, or almost 2 seconds.

The system is conservatively initialized with (MOUSECHORDWAIT 50). You may want to set it higher; 100 or even 200 might be acceptable. However, there are competing constraints. The lower the setting, the more difficult it is to chord (the more coordinated your fingers must be). The higher the setting, the longer the system waits, when you press left or right alone, before deciding it will not turn into middle; hence, the less responsive the mouse might seem in such cases.

Note: All the Lisp expressions and functions in this manual are in Interlisp. Therefore, you must either type them into an Interlisp Exec window or preface them with the characters *IL:* if you type them in any other Exec window. See Chapter 1, Introduction, for details.

RS-232 Serial Interfaces

Two serial ports are available: a standard RS-232 port, labeled DCE (Data Communications Equipment), and a TTY port, labeled Printer/DTE (Data Terminal Equipment). Xerox supplies a standard cable for the DTE port; the TTY port may require special cabling. For a complete description of RS-232 software support, see the RS-232 documentation in the *Lisp Library Modules Manual*.

Positioning the Equipment

Allow at least 14 inches around the sides of the display in case it needs to be serviced. Make sure there is some air circulation around the processor unit, otherwise the heat it produces may cause damage. The back of the processor must be at least six inches from the wall. If possible, provide enough space around the processor (an area four feet long by six feet wide, or an area that size in front of the processor) for servicing by the Xerox technical representative.

The processor should be positioned in a permanent location. Bumping and jarring it hard enough, even when turned off, can destroy the magnetic heads or the media of the local rigid disk. If you must move the processor, take care not to suddenly jolt or bump it. Make sure the disk drive heads are locked down and the spindle secured before you move the processor. If you are not sure how to do this, contact your system administrator or Xerox service representative.

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3.   USING THE 1108

Turning the 1108 On

1. Pull down on the cover of the Maintenance Panel if the cover is closed.

2. Push the rocker switch to the 1 position. The maintenance panel will display the numbers 8888.

Turning the 1108 Off

1. Type (LOGOUT) in an interlisp-D Exec window.

2. Turn the rocker switch to the 0 position.

Wait at least three minutes before turning the processor on again. This procedure allows the disk to spin down properly.

Booting the 1108

The installation and diagnostic software delivered with your Xerox 1108 comprises a boot file. The process of loading a boot file into the 1108 is called booting.

You can boot from either the rigid disk or a floppy disk. Normally, the rigid disk is set up so that turning on the processor resumes the last Lisp session. If the rigid disk has not been properly initialized, follow the procedures described in Chapter 5, Software Installation.

Note: You cannot boot from the Lisp Library modules or the Lisp Users modules, among

others. These are files that you must load explicitly when you are running Lisp.

Boot Types

Two types of booting are available on the Xerox 1108: normal booting and alternate booting. Normal booting assumes that Xerox Lisp has been properly set up in a logical volume of the rigid disk. Alternate booting lets you boot utility software from the rigid disk or a floppy disk.

Normal Boot

Once Xerox Lisp is properly installed, you can perform a normal boot by pressing and releasing the B RESET (left) boot button. The Maintenance Panel will go blank and then display 8888 for a few seconds, followed by a succession of Maintenance Panel codes. Xerox Lisp will be ready in about 60 seconds. If you end a Xerox Lisp session by logging out, a normal boot will resume that session. If you are running Xerox Lisp for the first time, the most recently installed logical volume will be booted.

Alternate Boot

To perform an alternate boot, hold down the B RESET and ALT B keys on the Maintenance Panel (MP), then release B RESET. The LED readout will show 8888, then cycle slowly from 0000 to 0010. When the number you want is displayed (see below), release ALT B. If you make a mistake, press both buttons to start again. The options are listed in the following table:

Table 1. Boot Options

Boot Option	Effect
0000 Rigid Disk	Boots Xerox Lisp from a logical volume on the local rigid disk. Usually, the logical volume selected will be the one containing the most recently used Xerox Lisp system; that is, if you terminate an Xerox Lisp session with LOGOUT, then 0-boot will resume that session from where you left off. However, if the most recent activity was installing a fresh Xerox Lisp system on a logical volume, 0-boot will boot from that logical volume. (To boot Xerox Lisp from any logical volume, use the Lisp System Tool.)
0001 Base State	Boots the 1108 into its base state. From this state it is possible to start utility programs such as diagnostics, or a tool to install and start Xerox Lisp on different logical volumes.
0002 Floppy	(Without diagnostics). Only specially configured Xerox floppies, such as *Installation Utility*, may be booted this way.
0005 Floppy	(With diagnostics). Only specially configured Xerox floppies, such as *Fixed Disk Diagnostic*, may be booted this way.
0010 Clean head	Floppy disk drive head cleaning function (see below).

Routine Maintenance

To keep your 1108 workstation in good working order, perform these tasks every month.

Keyboard

Brush off the keyboard to keep dust from building up under the keys. You may want to turn the keyboard upside down occasionally and shake it to dislodge foreign material. Be careful not to spill coffee or other liquids.

Mouse

Brush or wipe the dust from the surface of the mouse pad, since dust can interfere with the ball bearings of the two-button mouse, and the lens of the three-button mouse.

Move the mouse in circles on the mouse pad and check the movement of the cursor on the display screen to make sure it is operating smoothly. If you see any hesitation in cursor movement, have the mouse cleaned by a Xerox technical representative.

Display Screen

Lightly wipe your display screen with a damp cloth. You may use a commercial window cleaner by spraying cleaner on the cloth before cleaning the screen. Do not allow liquid to drip down into the housing around the screen.

Floppy Disk Drive

Clean the floppy disk drive heads as needed. If the heads are not kept clean, deposits can accumulate that can cause scratching or erasure of data on the disks. For best results, get a Xerox head cleaning kit and follow the directions.

Floppy Disks

Store floppy disks away from magnets, dust, and heat. Do not bend them. Do not write on their labels with ball-point pens or pencils of any sort. Any of these actions can result in loss of data.

Reporting Problems

The Xerox Lisp support team is committed to providing full support services to the entire Xerox Lisp user community. Users are encouraged to report problems with the system, errors in the documentation, and their general observations. Messages may be sent to us in several ways.

At most Xerox Lisp sites, there is one person designated as the Xerox Lisp System Administrator, typically an experienced user. If the System Administrator is not able to help you with your problem, he or she should be able to contact the Xerox Lisp support team for you.

Users with access to the ARPANET are encouraged to send mail to our net address:

AISupport.PASA@XEROX

Users without ARPANET sponsorship should call:
(800) 824-6449 (California)
or
(800) 228-5325 (Continental U.S.)
or write to:

Xerox AIS Support
Xerox Special Information Systems
250 North Halstead Street
Pasadena, CA 91109

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Introduction

The 1108 local rigid disk file system provides a flexible mechanism for storing and accessing files. It supports such features as random access and version numbers on files in addition to a hierarchical file naming structure.

Note: All the Lisp expressions and functions in this manual are in Interlisp. Therefore, you must either type them into an Interlisp Exec window or preface them with the characters *IL:* if you type them in any other Exec window. See Chapter 1, Introduction, for details.

Disk Partitions

You can partition the rigid disk into as many as ten regions, called *logical volumes,* or *partitions.* You can use partitions to hold Lisp virtual memories or Lisp files. Partitioning the disk helps you to manage the large amount of disk space by treating it as a number of smaller disks.

The partition, or logical volume, is the second part of a file pathname, as in

{DSK}<*PARTITION1*>*FILENAME.EXT;VERSION*

You can partition the disk with the *Installation Utility* floppy. However, because partitioning the rigid disk erases **all** its contents, make sure to partition the disk appropriately **before** storing anything on it. Otherwise, you will have to copy all the files from the disk to another device, repartition the disk, then copy the files back to the disk from the second device.

Although a Lisp virtual memory file, which contains a "snapshot" of a Lisp environment, can coexist on a logical volume with other files, it is advisable to give each virtual memory file its own logical volume. Otherwise, the resulting fragmentation adversely affects swapping performance. A logical volume intended to contain a Lisp virtual memory should be between 8,000 disk pages (4 megabytes) and 64,000 pages (32 megabytes) long.

To store Lisp files on a logical volume, you must create a Lisp directory on that volume, using the CREATEDSKDIRECTORY function (see below for instructions).

File System Utility Functions

As long as there is a logical volume that contains a Lisp directory, you can access the rigid disk device with {DSK}. Although Xerox Lisp emulates the rigid disk device with a core device called {PSEUDO-DSK} when no such directory is defined, this creates several problems:

(a) The core device provides limited scratch space for some system programs.

(b) When trying to initialize, Lisp fails to find {DSK}Init.Lisp and has to prompt you for an Init file.

(c) Since the core device is contained in virtual memory, it (and the files stored on it) can last only as long as you keep your virtual memory image.

Therefore, it is advisable to create a Lisp directory on a specific logical volume. To do this, open an Interlisp Exec window, then call

(CREATEDSKDIRECTORY *VOLUMENAME*)   [Function]

CREATEDSKDIRECTORY affects only the specified volume, and returns the name of the directory created. The device name {PSEUDO-DSK} disappears and {DSK} becomes the operative device name.

Install a Lisp directory only the first time the logical volume is used. After that, the system automatically recognizes and opens access to the logical volumes that contain Lisp directories.

If you ever want to get rid of a Lisp directory (and all the files in it), call

(PURGEDSKDIRECTORY *VOLUMENAME*)   [Function]

PURGEDSKDIRECTORY affects only the Lisp files on the specified volume. An alternative way to get rid of a Lisp directory is to use the System Tool to Erase the entire logical volume.

To find out whether a particular logical volume already has a Lisp directory on it, call

(LISPDIRECTORYP *VOLUMENAME*)   [Function]

It returns T if there is a Lisp directory, NIL if not.

To find out what logical volumes you have on your local disk, call

(VOLUMES)   [Function]

To find out the total size of a logical volume in disk pages, call

(VOLUMESIZE *VOLUMENAME*)   [Function]

To find out the number of free pages left on a volume, call

(DISKFREEPAGES *VOLUMENAME RECOMPUTE*)   [Function]

And to find out which logical volume contains the virtual memory you are currently running in, call

(DISKPARTITION)   [Function]

There is a display window that can keep track of the information provided by the functions LISPDIRECTORYP, VOLUMES, VOLUMESIZE, and DISKFREEPAGES. It appears by default in the lower left portion of the screen, and can be in one of three states: ON, OFF, or CLOSED.

ON means the display window is updated whenever the file system state changes. (This continuous updating can slow down the file system significantly.)

OFF means that the display window is open, but updated only when you press the left mouse button inside the window.

CLOSED means that the display window is closed and never updated. The display mode is initially set to CLOSED. To change the state of the display, call

(DSKDISPLAY NEWSTATE)   [Function]

DSKDISPLAY returns the old state of the file system display. If NEWSTATE is ON, OFF, or CLOSED, then the display state is changed to NEWSTATE.

To control the position of the display window, call

(DSKDISPLAY PLACE)   [Function]

Once the display window is open, you can update it or change its state by putting the mouse cursor in the window. Pressing the left button updates the window, and pressing the middle button brings up a menu that lets you change the display state. You can use this function to specify, in your Init file, where to place the display window on your screen.

Finally, once a Lisp directory has been installed on a logical volume, any program running in Lisp has access to the Lisp files on the volume. Access is provided through the usual device-independent file interface: CONN (to connect to any directory or subdirectory on the local disk), OPENSTREAM, CLOSEF, DELFILE, GETFILEINFO, SETFILEINFO, BIN, BOUT, LOAD, and so on. (See the *Interlisp-D*

Reference Manual and the *Lyric Release Notes* for details on these functions.)

File Name Conventions

Each logical volume with a Lisp directory serves as a directory of the device {DSK}. Files are referred to as

{DSK}<*LOGICALVOLUMENAME*>*FILENAME*

Thus, the file INIT.LISP on the volume LISPFILES is called

{DSK}<*LISPFILES*>*INIT.LISP*

In addition, you can use the > character in file names to delimit subdirectory names. Subdirectories let you group files for convenience or for logical sense. Files with subdirectories are written

{DSK}<*LOGICALVOLUMENAME*>*SUBDIR1*>...>*SUBDIRN*>*FILENAME*

For example, a file named *CHAPTER4.TEDIT* on the subdirectory *DOCUMENTATION* on the subdirectory *LYRIC* on the directory (logical volume) *LISPFILES* of your local rigid disk would be written:

{DSK}<*LISPFILES*>*LYRIC*>*DOCUMENTATION*>*CHAPTER4.TEDIT*

If you do not specify a directory in the file name, the system supplies default values. Suppose you are working in a file that you have not yet named. When you try to save it, for instance with the PUT command from TEdit, you will be prompted for a filename. If you specify MYFILE.TEDIT, the system looks for the next logical volume that has a Lisp directory, and returns

{DSK}<*LISPFILES*>*MYFILE.TEDIT*

The only utility function listed above that does not default directory names is CREATEDSKDIRECTORY.

If you want to find out what the default Lisp directory is, call

(DIRECTORYNAME '{DSK})

This defaulting convention is necessary because several parts of the Xerox Lisp system create scratch files on the device {DSK} without specifying a directory (logical volume).

Disk Scavenging

The Lyric release provides a disk scavenging service to help you recover from the unlikely event of file system failure. There are two classes of file system failure: Lisp directory failure and lower-level, Pilot operating system failure. Scavenging for Lisp directories is provided by the function SCAVENGEDSKDIRECTORY; scavenging for Pilot is provided by the System Tool.

Note: Even if you think you have a directory problem, it is **always** better practice to use the System Tool to scavenge the logical volume before you use SCAVENGEDSKDIRECTORY.

Lisp directory failures show up as infinite looping or other aberrant behavior while the system is doing a directory search or enumeration. To repair the directory, return to the Interlisp Exec window and call

(SCAVENGEDSKDIRECTORY *VOLUMENAME*)   [Function]

This function deletes the old directory, then reconstructs it from the files on the given logical volume.

Pilot failures manifest themselves as "HARD DISK ERROR" breaks within Lisp. To fix such a failure, return to the Interlisp Exec, log out of Lisp and get

into the System Tool. Invoke the **Scavenge!** command for the damaged logical volume.

If the System Tool reports no problems, return to Lisp and call SCAVENGEDSKDIRECTORY as described above. If the System Tool reports any problems, each problem is described by a message in the format:

[fileID] type = file type; problem description

The fileID is a pair of numbers separated by a comma. The file type is a single number. If it is in the range 10048 to 10077 inclusive, the damaged file belongs to the Lisp local file system. You can safely ignore any other file types.

If the file is in the Lisp local file system, examine the problem description to determine your next course of action. There are five possible problems.

1. unreadable pages [first...last plus one)

This indicates a hardware problem. You should run the disk diagnostics and let the program mark the bad pages.

2. missing pages [first..last plus one)

Some of the file pages have not been allocated correctly. You will probably see this after getting VERIFY ERRORS in Lisp.

3. duplicate page found

Self-explanatory

4. orphan page found

The scavenger found an allocated disk page that it believes belongs to no allocated file.

5. unknown problem

This is a catch-all for cases not covered by the previous four.

Return to the Interlisp Exec window and call SCAVENGEDSKDIRECTORY from Lisp, unless case 1 or 2 reported that page 0 of a file was damaged. If the only problems were case 3 or 4, you should be able to resume normal operation.

In cases 1, 2, and 5, we recommend that you copy the files from the local rigid disk to floppies or a file server, then erase the volume using the System Tool's Erase! command. Do not attempt to access these damaged Pilot operating system files in any way. The function FILENAMEFROMID will let you translate from Pilot file IDs into Lisp file names.

(FILENAMEFROMID *LOWHALF HIGHHALF VOLUMENAME*   [Function]

This function takes a Pilot file ID as printed by the Scavenger and tries to find that file in the Lisp directory of the given volume. It returns a string with the file name if successful, NIL otherwise. The Pilot scavenger prints file IDs in octal.

If you have any doubt about which logical volumes to scavenge, scavenge them all. The scavenger does not harm an intact volume.

Copying Floppy Disks

You can use the **Floppy!** command of the Lisp System Tool to copy and manipulate floppy disks. See "The Lisp System Tool" in Chapter 6, System Tools.

You can also copy floppy disks with the Floppy Disk Utility provided on the *Fixed Disk Diagnostic* floppy. This utility lets you copy an entire floppy image from a source floppy disk to a destination floppy disk.

5. SOFTWARE INSTALLATION

Introduction

This chapter describes the entire installation process in detail. If you are an experienced Lisp user, you may want to follow your own procedures, since there is often more than one way to get things done in a Lisp environment. However, the procedures outlined below are strongly recommended. For details on specific application modules, see the *Lisp Library Modules Manual*.

Note: All the Lisp expressions and functions in this manual are in Interlisp. Therefore, you must either type them into an Interlisp Exec window or preface them with the characters *IL:* if you type them in any other Exec window. See Chapter 1, Introduction, for details.

Installation of software on the Xerox 1108 is a three-step process: partitioning the rigid disk into logical volumes, loading the SystemTools volume with utility software (to run diagnostic tests and be able to reinstall Lisp), and installing Lisp on each Lisp volume.

Since you will seldom want to repartition your disk, and you only need to load System Tools once, you will normally be concerned only with the last of these three steps. However, under certain circumstances, such as an intentional disk repartitioning or a "catastrophic error", you will need to repartition the rigid disk and reinstall *utility* software on the SystemTools volume.

Note: Because the Lyric Release requires a larger System Tools volume than earlier releases, you will need to repartition the first time you install a Lyric sysout.

If your workstation is not connected to a network, read the section that follows. If you are on the network, skip to "Partitioning the Rigid Disk".

Setting Date and Time on Standalone Workstations

Xerox 1108 software is designed to accept date and time information automatically from the network. If time service is not available, or if the Xerox 1108 is not on a network, you must set the date and time manually. You can do this with the SETTIME function when Xerox Lisp is running, or by performing a 2-boot on either the *Installation Utility* floppy or the *Fixed Disk Diagnostic* floppy, then responding to the prompts for date and time. (For booting instructions, please refer to Chapter 3, Using the 1108.)

Using the SETTIME Function to Set Time

If the date and time are not set after you turn the Xerox 1108 on and perform a 1-boot, the boot process will suspend itself *temporarily,* with the MP code 0937 displayed on the Maintenance Panel. If no time service is available, you must set date and time manually.

In general, the recommended procedure for systems without time service is to boot into Lisp and set the time and date with the function SETTIME.

To call SETTIME when Xerox Lisp is running, type the date and time in an Interlisp Exec window, for instance:

(SETTIME "9-APR-87 10:44:00")

Note: Time information is not maintained when the machine is powered down.

Using the Installation Utility Floppy to Set Time

If you are not connected to a network, be sure to set the time after booting the *Installation Utility* floppy. You will be prompted as follows:

Time zone offset from Greenwich (-12 - 12):
Enter the appropriate value (see the Time Zone Offset Table below) and press <RETURN>

Minute offset (0..59):
Enter 0 and press <RETURN>

First day of daylight savings time (121):
Enter 121 and press <RETURN>

Last day of daylight savings time (305):
Enter 305 and press <RETURN>

Please enter date and time:
Enter date and time in the format shown
month/day/year hours:minutes:seconds
For example, 7/15/87 15:42:00

Set time to July 15, 1987 3:42 PM

Okay?
Respond by typing Y or N.

Table 2. Time Zone Offsets

-12:	(ocean)	1:	Paris
-11:	Nome	2:	Helsinki
-10:	Honolulu	3:	Moscow
-9:	Marquesas Islands	4:	Teheran
-8:	Los Angeles	5:	Sverdlovsk
-7:	Denver	6:	Tashkent
-6:	Chicago	7:	Novosibirsk
-5:	New York	8:	Hong Kong
-4:	Buenos Aires	9:	Tokyo
-3:	Brasilia	10:	Vladivostok
-2:	Greenland	11:	Caroline Islands
-1:	Cape Verde Islands	12:	Aukland
0:	Greenwich	-12:	(ocean)

Partitioning the Rigid Disk

The Xerox 1108 comes with the disk appropriately partitioned for your disk configuration. Ordinarily, it is only necessary to repartition the disk in the event of a catastrophic error. However, there are exceptions, one of which is noted below.

Note: Because the Lyric Release requires a larger System Tools volume than earlier releases, you will need to repartition before you load your first Lyric sysout.

The 10, 29, 42, or 80 megabyte (MB) rigid disk is pre-partitioned with multiple logical volumes, depending on the disk size. The 10 MB disk is partitioned into three logical volumes, named SystemTools, Lisp, and LispFiles. The 29, 42, and 80 MB disks are partitioned into a subset of the following logical volumes: SystemTools, Lisp, Lisp2, Lisp3, LispFiles and LispFiles2.

The logical volumes Lisp, Lisp1, Lisp2, and Lisp3 can each contain a complete Xerox Lisp environment. Each volume holds the Lisp virtual memory, which can be initialized from the floppy disks, file server, or the local disk.

The SystemTools logical volume uses 4,200 pages (1 page = 512 bytes) and contains the Profile Tool, the Online Diagnostics Tool, and the Lisp SystemTool for installing Xerox Lisp on the local rigid disk and moving between Lisp volumes on the local disk.

CAUTION

Unless your 1108 is new, you will need to repartition your rigid disk to accomodate the new System Tools volume. Partitioning the disk destroys ALL disk files, so be sure to save all your user files before partitioning. Whenever you partition or repartition the disk, set up a directory on your LISPFILES volume with the CREATEDSKDIRECTORY function.

Standard Disk Partitions

Table 3, Standard Disk Partitions, shows standard configurations (in pages) for each rigid disk size.

Table 3. Standard Disk Partitions

MB	System Tools	Lisp	Lisp2	Lisp3	LispFiles	LispFiles2
10	4,200	4,000	N/A	N/A	900	N/A
29	4,200	16,200	N/A	N/A	24,000	N/A
	4,200	16,200	16,200	N/A	8,000	N/A
42	4,200	20,000	20,000	N/A	21,000	N/A
	4,200	32,500	N/A	N/A	28,000	N/A
	4,200	32,500	16,200	N/A	12,000	N/A
80	4,200	50,000	N/A	N/A	70,000	N/A
	4,200	50,000	16,200	16,200	19,000	11,000
	4,200	32,500	32,500	32,500	19,000	11,000

Non-Standard Disk Partitions

With System Tools installed, you can specify non-standard partition volumes and sizes with the *Make Script!* command of the Lisp SystemTool window (see Chapter 6, System Tools). This adds an entry to the *Installation Utility* disk, providing a "USER SPECIFIED PARTITION" option in the Installation Utility Menu. Selecting this option installs the user-defined partition.

Note: Do not specify a Lisp volume longer than 65,535 pages. Always create a directory on your LispFiles volume.

Partitioning Instructions

When you need to repartition the disk:

1. Perform a 2-Boot on the *Installation Utility* floppy. If your 1108 is not on a network, you will be prompted to set the time. (See "Setting the Date and Time on Standalone Works Stations" above for instructions.)

2. When the Installer Menu appears, select the menu item appropriate for partitioning your particular rigid disk.

3. You will be warned that the

   PARTITIONING OPERATION DESTROYS THE CONTENTS OF THE DISK.

   CONTINUE?(Y/N)

   Respond by typing Y.

4. When the Installer Menu reappears, proceed with the next section. Your disk is now repartitioned. If you create a LispFiles volume (which you always should), remember to install a Lisp directory, using

```
(CREATEDSKDIRECTORY 'LispFiles)
```

   the first time you boot your Lisp volume.

Reinstalling Utility Software on the System Tools Volume

The Xerox 1108 comes with utility software installed on the SystemTools volume. When you need to reinstall utility software, either for a new software release or after repartitioning, use the *Installation Utility* and *System Files #1* and *#2* floppy disks distributed with the Xerox Lisp software kit.

1. If an installation menu is not currently displayed, perform a 2-boot on the *Installation*

Utility floppy. After about two minutes, a menu of utility options will be displayed.

If your 1108 is not on a network, you will be prompted to set the time (see above).

2. Select the menu item **Initialize Workstation SystemTools Volume**. You will be prompted to insert the *System Files* floppy disks. Insert them in the order prompted. The SystemTools volume will be loaded in a few minutes.

3. When you finish loading the System Tools floppies, the Installer Menu will reappear. If your workstation is connected to an old (non-IEEE 802.3 compatible) PUP network, then select the **Configure System Tool for Old PUP Network** option. Otherwise, continue to the next step.

4. At this point, you are ready to initialize the Lisp SystemTool software. Choose the menu option **Boot SystemTools Volume**.

5. After about two minutes, the cursor will change to a pointing arrow. Activate the System Tools Executive window by positioning the cursor over the letters "cut" in the word "Executive" in the small box in the bottom left corner of the screen, then press the left mouse button. This will expand the box into a window. To activate the window, press any mouse button when the cursor is inside it.

6. Insert the *System Files #1* floppy.

7. Type on one line:

`floppy read init.cm; @init.cm`

and press < RETURN >. This loads and executes a command file that initializes System Tools.

After about one minute, the command will finish executing and the bouncing white rectangle should appear on your screen,

indicating you are in the base state. Now you can use the Profile Tool to create the site-specific file that the Lisp SystemTool needs.

8. Press both left and right mouse buttons to activate the Profile Tool. Fill in the appropriate values for the various parameters.

    Note: If your 1108 is attached to a Xerox NS Clearinghouse, you must set the *Domain:* and *Organization:* parameters to the names defined in your Clearinghouse data base. If it is not so connnected, these parameters are irrelevant and should be left blank. These parameters can never exceed 20 characters.

    You do not have to supply values for all parameters in the window. (If you supply a password, it is stored on the disk in an unencrypted form.) The Profile Tool supplies default values for the various fields in the Lisp SystemTool.

9. After setting the appropriate parameters, execute the *Set Profile!* command and confirm with the left mouse button. You have now set the default values that System Tools will use when activated.

10. When the word Done appears in the window, select *Quit!*. The Profile Tool window will disappear and you will return to the bouncing white rectangle. Now you are ready to install Xerox Lisp software on your Lisp volume(s).

Installing Xerox Lisp/Starting a Lisp Volume

There are four ways to install Xerox Lisp software on a Lisp volume: from floppy disks, from your file server, from a sysout file stored on your Lispfiles volumes, or from another logical volume, called a sysout cache, on your local disk.

Installing Xerox Lisp from Floppy Disks

To install Xerox Lisp in the form of the Lisp sysout from the floppies distributed with the Xerox Lisp software kit:

1. From the base state (bouncing rectangle), press the left mouse button to enter the Lisp SystemTool. (If you are not in the base state, you can activate it with a 1-boot.)

CAUTION

Be careful not to press the mouse button more than once for a given command. The system remembers mouse "clicks", so you can accidentally reinstall floppy data in the wrong place.

---

2. Point the cursor to **Device:** "FLOPPY" and press the left mouse button. The **File:** parameter will now show "Filename.sysout". Fill in the correct name of the sysout file by pointing to **File:**, pressing the left mouse button, deleting the text, and typing in the correct name, such as "Lisp.sysout". If you do not know the correct name, ask your system administrator.

3. Now point the cursor to **Sysin!** and press the left mouse button. Follow the dialogue to load your Xerox Lisp floppies. The system will ask you to confirm with the left mouse button once you have inserted the proper floppy.

4. Once the installation is complete, select **Boot!** to boot your fresh Xerox Lisp software.

Installing Xerox Lisp from a File Server

1. From the base state, press the left mouse button to activate the Lisp SystemTool.

2. Fill in the appropriate parameters in the Parameter Subwindow. The *File:* parameter should be filled in with the file name of the Lisp Sysout to be installed.

    For a PUP and FS file servers, the file path name takes the form:

`[Server]<Directory>Subdirectory>FileName.Sysout`

3. Select the *Sysin!* command and confirm with the left mouse button. Your Command Subwindow displays an hour glass symbol while the Message Subwindow displays the number of bytes transferred to your disk. This gives you an idea of the time remaining for the file transfer. You can abort this command by pressing the STOP key.

4. When the sysout has been retrieved, *Done* appears in the Message Subwindow. Now you can select *Quit!* to stop the process and return to the base state, or *Boot!* to enter the Lisp volume and start Xerox Lisp.

Installing Xerox Lisp from the Local Disk

You can install a sysout directly from the Lisp local file system. This can be useful for creating and loading your own sysouts.

1. From the base state, press the left mouse button to activate the Lisp SystemTool.

2. Select the **Local Disk** server option and fill in one of the appropriate parameters in the Parameter Subwindow. The *File:* parameter should be filled in with the file name of the Lisp Sysout to be installed.

The file path name takes the form:

`<volume>directory>filename.sysout`

3. Select the *Sysin!* command and confirm with the left mouse button. Your Command Subwindow displays an hourglass symbol while the Message Subwindow displays the number of bytes transferred to your disk. This gives you an idea of the time remaining for the file transfer. You can abort this command by pressing the STOP key.

4. When the sysout has been retrieved, Done appears in the Message Subwindow. Now you can select *Quit!* to stop the process and return to the base state, or *Boot!* to enter the Lisp volume and begin Xerox Lisp.

Installing Xerox Lisp from Another Lisp Volume

If you have two Lisp Volumes (partitions), you can use the *Copy VMem!* command of the Lisp SystemTool to make a copy of the Lisp sysout on one volume and store it on another. The volume used for storage is called a Sysout Cache. Creating a Sysout Cache can make installing a new Lisp sysout much easier for you.

If you store a Lisp sysout on a Cache volume, then whenever you need a new sysout, you can simply copy the sysout from the cache volume to the volume you run Lisp in. This is much faster than installing Lisp from floppies, and is significantly faster than installing from a network.

For example, if you have two standard Lisp Volumes, Lisp and Lisp2, you can run Lisp in the Lisp volume and use Lisp2 as your Sysout Cache. On the other hand, if you have just installed a Lisp sysout on the Lisp volume, or if you have been running in the Lisp volume and you want to save your current

Lisp environment, then copy from the Lisp volume to the Lisp2 volume.

1. From the base state, press the left mouse button to activate the Lisp SystemTool.

2. Select the **CopyVMem!** command from the Command Subwindow and confirm with the left mouse button.

3. When a new window appears, select the source and destination volumes as desired.

4. Select the **Start!** command. You will be asked to confirm the start command with the left mouse button. This will copy the source sysout and expand virtual memory to fill the entire destination volume.

5. After the sysout has been copied and expanded (System Tools automatically expands the sysout to take up the maximum available space on the Lisp volume), System Tools will ask you if you want to boot the copied sysout. If you are copying from your normal Lisp volume to your Cache volume, do not boot the Cache volume; leave it untouched for later use. If you are copying Lisp from the Cache volume to the volume you run Lisp in, let the system boot that volume for you.

Starting a Logical Volume

There are three ways to start a logical volume with Xerox Lisp software installed.

1. Lisp SystemTool

    Set the **Volume** parameter to the name of the Lisp volume you want to start (see Chapter 6. System Tools). Select the **Boot!** command and confirm with the left mouse button.

2. 0-boot

Perform a 0-boot to bring up the last Lisp Volume entered. Turning the 1108 on is equivalent to performing a 0-boot.

3. STOP Key

    From the base state, press the STOP key to boot Xerox Lisp from the Lisp volume if you have already defined one. If no Lisp volume is defined, the STOP key has no effect. Press the left mouse button to activate the Lisp SystemTool.

Starting Xerox Lisp

When you start Xerox Lisp for the first time on any volume, you may be prompted for a PUP (PARC Universal Packet) host ID number. This number identifies the 1108 for PUP-based Ethernet communications. If you are prompted for a PUP host ID number, see your system adminstrator.

If there is no INIT.LISP file stored on the local rigid disk, you will be asked to supply the name of the system Init file. The Init file contains information that configures Xerox Lisp for your installation. If you prefer not to specify an Init file, press <RETURN>.

The first time you start a Lisp logical volume after partitioning, there is no directory installed on the LispFiles volume. Consequently, all {DSK} files are treated as core files, assigned to the logical device {PSEUDO-DSK}. This means they are stored in the 1108's core memory, and will be volatile in addition to taking up valuable memory space. To correct this situation, use

(CREATEDSKDIRECTORY *'LispFiles*)   [Function]

See Chapter 4, File System, for further details on the CREATEDSKDIRECTORY function.

Loading Fonts

The Lisp Sysout requires certain information to display and print text in various fonts. The Lisp Sysout initially comes with a small set of fonts installed, and additional fonts are supplied in files on floppies. As you use various programs or modules, you will probably need to access some of these additional fonts.

The font file names correspond to their equivalent Xerox System Integration Standards (XSIS) character sets. For instance, the file Modern08-MRR-C356.DisplayFont contains 8 point Modern typeface characters, corresponding to character set 356 (octal) in XSIS character standard for the screen. The WD extension on printer metric files stands for width.

Floppy Disks Needed

The Display Fonts floppy disks contain files of font information for the workstation display; the Font Metrics floppies contain files of font metric for formatting text for hardcopy printing. Their exact contents are listed in Appendix B.

Font Installation Instructions

You will need to copy some of the font files from each set of floppies onto either your workstation's disk or a file server. Tell Lisp where you put the files by setting the variables DISPLAYFONTDIRECTORIES (for display font files) and INTERPRESSFONTDIRECTORIES (for printer font files). Each of these variables is a list of one or more directory specifications, most conveniently set in your personal or site Init file.

For example, if you copy the fonts to the FONTS subdirectory on your local rigid disk, set each of

these variables to ({DSK}<*LISPFILES*>*FONTS*>), by typing into an Interlisp Exec:

```
(SETQ DISPLAYFONTDIRECTORIES
'({DSK}<LISPFILES>FONTS>]
```

If you store them on the LispFonts directory of the file server {YOURSERVER}, set the variables to ({YOURSERVER}<*LISPFONTS*> by typing into an Interlisp Exec:

```
(SETQ DISPLAYFONTDIRECTORIES
'({YOURSERVER}<LISPFONTS>]
```

To store the display fonts and the printer font metrics in different places, assign different values to the variables DISPLAYFONTDIRECTORIES and INTERPRESSFONTDIRECTORIES.

The fonts you are most like to need for normal Xerox Lisp operation are listed in Table 4.

Table 4. Fonts Necessary for Normal Lisp Operation

Display Fonts	Printer Metrics
Terminal08-MRR-C0.DisplayFont	Terminal08-MRR-C0.WD
Terminal08-MRR-C356.DisplayFont	Terminal08-MRR-C356.WD
Terminal08-MRR-C357.DisplayFont	Terminal08-MRR-C357.WD
Modern08-MRR-C0.DisplayFont	Modern08-MRR-C0.WD
Modern08-MRR-C356.DisplayFont	Modern08-MRR-C356.WD
Modern08-MRR-C357.DisplayFont	Modern08-MRR-C357.WD
Modern08-MIR-C0.DisplayFont	Modern08-MIR-C0.WD
Modern08-MIR-C356.DisplayFont	Modern08-MIR-C356.WD
Modern08-MIR-C357.DisplayFont	Modern08-MIR-C357.WD
Modern10-MRR-C0.Displayfont	Modern10-MRR-C0.WD
Modern10-MRR-C356.DisplayFont	Modern10-MRR-C356.WD
Modern10-MRR-C357.DisplayFont	Modern10-MRR-C357.WD
Gacha10-MRR-C0.DisplayFont	Gacha10-MRR-C0.WD

However, we recommend that you copy all the font files that end in the following (remember that the asterisk* functions as a wild card):

Table 5. Optional, Recommended Fonts

Display Fonts	Printer Metrics
*-C0.DisplayFont	*-C0.WD
*-C356.DisplayFont	*-C356.WD
*-C357.DisplayFont	*-C357.WD
*-C360.DisplayFont	*-C360.WD
*-C361.DisplayFont	*-C361.WD

The recommended set of fonts includes all the characters necessary to type most European languages, including accents and accented characters. To use characters from other languages, copy the files in the following table:

Table 6. Fonts for Non-Roman Alphabets

Language	Display Fonts	Printer Metrics
Greek	*-C46.DisplayFont	*-C46.WD
Russian	*-C47.DisplayFont	*-C47.WD
Hiragana	*-C44.DisplayFont	*-C44.WD
Katakana	*-C45.DisplayFont	*-C45.WD

If you want to type Japanese or Chinese Kanji, copy all the font files.

Additional Information on Installation and Use of Fonts

Whenever a program tries to use a new font, Lisp searches the appropriate font directories for the font file. If Lisp finds the font file, it reads and loads it automatically.

Occasionally, a program will require a font which for some reason is not available (perhaps the file server is unavailable, or the font file is not on any directory listed in the appropriate font directory). When this happens, a break window appears with the message "font not found", and the required font is then listed.

The best way to recover is to install the requested font. For example, if the break window reports that the missing font is

```
(GACHA 12 (MEDIUM REGULAR REGULAR) 0 DISPLAY)
```

and if DISPLAYFONTDIRECTORIES contains {DSK}<*LISPFILES*>*FONT*>, you can copy the file GACHA12-MRR-C0.DISPLAYFONT from the DISPLAYFONT floppy to {DSK}<*LISPFILES*>*FONT*> and then type into the break window:

```
(RETFROM 'FONTCREATE (FONTCREATE 'GACHA 12 'MRR 0
'DISPLAY)
```

Alternately, you can abort the program with the up-arrow key, or you can substitute a different font. If the requested font is for the display, you can substitute the default display font by entering to the break window:

```
(RETFROM 'FONTCREATE (DEFAULTFONT 'DISPLAY))
```

However, since this is equivalent to performing a different font substitution than the module intended, the resulting formatting may be unpredictable.

Organization of Fonts on Floppies

As of the Lyric release, font floppies are organized by character sets. Each floppy is named according to the character set it contains. This makes it much easier to find and load specific character sets. For a detailed description of the contents of each floppy, see the Display Font floppy directories in this release.

Loading Xerox Lisp Modules

Xerox supplies Xerox Lisp software modules on two sets of floppies: the *Lisp Library* contains software supported by Xerox, and *LispUsers* contains user-written software not supported by Xerox.

Each module consists of one or more compiled files (indicated by the extension *.LCOM*). There are also floppies containing fonts (see the previous section).

To load a module from these floppies into a running Lisp environment, insert the floppy containing the module you need and use the LOAD function to read it into virtual memory. For example, to load the Grapher module, type in an Interlisp Exec window:

```
(LOAD '{FLOPPY}GRAPHER.LCOM)
```

If you are loading many modules, you may find it convenient to connect to the floppy device first by typing:

```
CONN {FLOPPY}
```

after which you can simply type:

```
(LOAD 'GRAPHER.LCOM)
```

When a module such as Grapher is loaded, the system automatically tries to load all the files the module depends on, whether they have already been loaded or not. If the required files are stored

on a floppy disk other than the one currently in the floppy disk drive, the system will fail to find them.

Consequently, many users with a file server or a large disk prefer to copy the contents of the floppies to a file server or disk. Then the system can load all the necessary files directly from the server or disk without further intervention, and users can either copy everything on the floppies or just the modules required.

The Library module CopyFiles is useful for loading the contents of the floppies to a file server or to a local rigid disk. Load the file COPYFILES.LCOM from the Library and then, for each floppy you want to copy, type in an Interlisp Exec:

(COPYFILES '{FLOPPY} '{HOST}<DIRECTORY>)

where {HOST}<DIRECTORY> specifies either a directory on a file server where space has been set aside for Library files, or {DSK}<*LISPFILES*> if you are copying the files to the local rigid disk.

If you only want to copy selected files from the floppies, you can copy them one at a time with the COPYFILE function. However, it may be more convenient to use the File Browser to look at each floppy's contents and copy the files you want. See the *Lisp Library Modules Manual* entries on the CopyFiles and File Browser modules for more details.

How to Load From Library Floppies

Some modules in the Library consist of several files; some also require that other modules be present in the environment before they can operate, as described above. When you load the "main" file of a module, the system automatically tries to load all the required subsidiary files. However, when you load Library files from floppies, the subsidiary files may not all be located on a single floppy. If some

of the subsidiary files are located on a different floppy than the main file, the system will not be able to find them. The loading process will stop with a *File Not Found* error and display a break window. To avoid this error, you must explicitly load first the subsidiary files, then the main file.

The easiest way to ensure that a file is only loaded once is to use the function FILESLOAD, which automatically appends the correct extension to the file name and checks to see whether it is already loaded (in which case it does nothing). For example, to load the KeyboardEditor module, insert *Library Floppy #2*, then type in an Interlisp Exec:

```
(FILESLOAD KEYBOARDEDITOR)
```

FILESLOAD takes an arbitrary number of arguments.

You can also tell whether a file is loaded by looking at its property list with the PL command. A loaded file has the property FILEDATES, which indicates its source and date. For example, typing:

```
PL DEDIT
```

in the Interlisp Exec causes it to display values similar to:

```
FILEDATES : (("26-Nov-86 17:02:41"
{ERIS}<LISPCORE>LIBRARY>DEDIT.;5))
Definition-for-EDITL: DEDITL
Definition-for-EDITE: TTY/EDITE
Definition-for-EDITDATE: DEDITDATE
COPYRIGHT : ("Xerox Corporation" 1986 1987)
FILE: ((DEDITCOMS.Compiled))
```

Note: If the Interlisp Exec window turns black during the loading of any module or file, put the mouse cursor inside the Interlisp Exec window, press the left button, then press the space bar or <RETURN>. Pressing the space bar twice in succession will allow the rest of the module to load without further interruption.

Loading the TEdit Library Module

Note: For those modules that require TEdit, follow the instructions for loading TEdit, load any other subsidiary files, then load the main file. The TEdit module is described fully in the *Documentation Tools Manual*.

To load TEdit smoothly, you must take some preparatory steps. These instructions assume you are using your local rigid disk, rather than a file server, to store fonts and files.

1. Copy the MODERN10-MRR-C0.DISPLAYFONT from *Displayfont Floppy #2* to your local rigid disk. Insert *Displayfont Floppy #2* into the floppy drive and type into an Interlisp Exec window:

```
DIR {FLOPPY}
```

2. After the directory appears, type:

```
(COPYFILE'{FLOPPY}MODERN10-MRR-C0.DISPLAYFONT
'{DSK}<LISPFILES>MODERN10-MRR-C0.DISPLAYFONT)
```

3. Now repeat steps 1 and 2, using *Displayfont Floppy #7* instead of *Displayfont Floppy #2*. The two font files you need to copy are: GACHA12-MRR-C0.DISPLAYFONT and HELVETICA08-BRR-C0.DISPLAYFONT. Do not forget to type

```
DIR {FLOPPY}
```

in the Interlisp Exec every time you load a floppy into the drive.

4. When the copying process is complete, set the variable DISPLAYFONTDIRECTORIES so files that require this font will know where to find it. In the Interlisp Exec window, type:

```
(SETQ DISPLAYFONTDIRECTORIES '({DSK}<LISPFILES>))
```

5. You also need to set the DIRECTORIES variable to a list of places where a file will look for the allied files it needs for a successful load. Type:

```
(SETQ DIRECTORIES '({FLOPPY} {DSK}<LISPFILES>))
```

Now you must copy the TEdit files from floppy to your local rigid disk. Use the LOAD-TEDIT module on *Lyric Library Floppy #1*.

5. Insert *Lyric Library Floppy #1* and type:

```
DIR {FLOPPY}
```

6. When the directory is displayed, type:

```
(FILESLOAD LOAD-TEDIT)
```

This completes the loading sequence for the TEdit module.

Note: Once any variable has been set, you can type it into an Interlisp Exec and the system will return the appropriate values. For instance, typing

```
DIRECTORIES
```

will return something that resembles

```
("{Erinyes}<Lyric>Library>"
"{Erinyes}<Lyric>Internal>Library>"
"{Eris}<LispUsers>Lyric>"
"{Erinyes}<Lyric>LispUsers>"
"{Erinyes}<Lyric>Sources>")
```

if the directories are set to the appropriate file servers, or NIL if they are not set at all.

Loading the Grapher Library Module

Successful loading of the Grapher module requires that all the Helvetica display fonts be accessible during the load. You must copy the Helvetica display fonts to an accessible place, such as your local rigid disk. The easiest way to transfer the fonts from floppy to a local rigid disk is to use the library module Copyfiles. You will find COPYFILES.LCOM on *Library Floppy #1*.

1. Insert *Lyric Library Floppy #1* in the floppy drive and type in the Interlisp Exec window:

DIR {FLOPPY}

2. After the directory is displayed, type in the Interlisp Exec window:

(FILESLOAD COPYFILES)

Once COPYFILES is loaded into your virtual memory, you can copy all the Helvetica fonts to your disk at once.

3. Insert *Displayfont Floppy #7* in the floppy drive and type in the Interlisp Exec window:

DIR {FLOPPY}

4. After the directory is displayed, type in the Interlisp Exec window:

(COPYFILES '{FLOPPY}HELVETICA*
'{DSK}<LISPFILES>HELVETICA*)

Transferring the Helvetica display font files to your disk will take about one minute.

5. Once the fonts are on your local rigid disk, you must set the variable DISPLAYFONTDIRECTORIES to the place where you installed the fonts. Type in the Interlisp Exec window:

(SETQ DISPLAYFONTDIRECTORIES '({DSK}<LISPFILES>))

You are now ready to load the Grapher Library module.

6. Insert *Lyric Library Floppy #2* in the floppy drive and type in the Interlisp Exec window:

DIR {FLOPPY}

7. After the directory is displayed, type in the Interlisp Exec window:

(FILESLOAD GRAPHER)

This completes the loading sequence for the Grapher Library module.

6. SYSTEM TOOLS

Introduction

When the Xerox 1108 is in the base state (a bouncing white rectangle on a dark background), you can invoke the Lisp System Tool, Profile Tool, and On-line Diagnostics, as well as boot the Lisp Volume.

Enter the base state with a 1-boot (see Chapter 3, Using the 1108, for instructions). If the bouncing white rectangle does not appear, make sure you have loaded the software correctly, as described in Chapter 5, Software Installation.

Each tool displays its own window. Although not specifically labeled, each window is divided from top to bottom into regions for the following purposes:

- Displaying version date and time

- Displaying error messages

- Specifying all data parameters

- Containing all available commands

- Displaying interactive messages

Select parameter fields with the left mouse button. Parameter menus are available in some cases, and they can be selected by pressing either both mouse buttons on a two-button mouse, or by using the middle mouse button on a three-button mouse. Use the DELETE key to delete any selection.

Use the mouse button or the NEXT key to advance to the next field in the window. Using the NEXT key to advance the cursor will delete whatever is already displayed in that parameter field. If you accidentally erase a filled-in fields, use the UNDO key to restore it to its previous state.

If you are unfamiliar with mouse and window manipulations, read the on-line help from the Diagnostics tool.

The Profile Tool

The Profile Tool lets you set a number of parameters that are used by the Lisp System Tool for installing Envos Lisp sysouts. For example, if the path name to your sysouts is always the same, you can enter that name into the Profile Tool. This changes the default value of the **File:** parameter in the Lisp System Tool. Once you do this, the **File:** parameter will be filled in whenever you open the Lisp System Tool to fetch a sysout. You can change the default values in the Lisp System Tool window.

Procedure:

● To activate the tool from the base state, press the middle mouse button.

● Select the parameters you want to set or change.

● Select the **Set Profile!** command.

● Confirm by pressing the left mouse button when the mouse icon appears. Press the right mouse button to abort the command.

● Select **Quit!**.

ENVOS: Profile Tool of 17-Aug-86 17:57

User: User Name   **User Password:**   **Domain:**

Organization: User Organization   **Device:** {PUP-FS, ▓▓▓▓, TcpFTP, Floppy, Local Disk}

Volume Menu: **Current Password:**   **New Password:**

NS File-Pathname: (NSHost:Domain:Organization)Directory/SubDirectory/FileName.sysout

Pup File-Pathname: [PupHost%]<Directory>SubDirectory>FileName.sysout

TCP FTP File-Pathname:

Floppy File Name: Lisp.Sysout

Local File Name: <LispFiles>Directory>FileName.sysout

Default Lisp Volume: Lisp   **Boot Volume For STOP Key:** Lisp

CopyVM From Volume: Lisp2   **CopyVM To Volume:** Lisp

-- TCP Setup Options --

Host Address: **Gateway Address:**

Subnet Mask: **Name Server:**

Set Profile!   **Change Password!**   **Edit TCP Host Table!**   **Quit!**

Figure 11. The Profile Tool Window

Parameter Items

The Profile Tool has the following parameter items:

User/User Password:

Your NS/PUP user and password names used to log in to the remote file server. (For PUP users, the name should be followed by a registry, such as YourName.PA) You do not have to supply the password in the Profile Tool; you can enter it in the System Tool Window instead. If you supply a password, it is stored on the disk in unencrypted form.

Domain/Organization:

Your domain and organization name. If you do not use an NS file server, these parameters are irrelevant and should be left blank.

Device:

Selects the type of device on which the Lisp sysout file is stored. The choices are PUP-FS, NS-FS, TcpFTP, Floppy, and Local Disk.

Volume Menu:

Used to select a particular volume for operations. You can specify a password for each volume.

Current Password:

Current volume password, initially set to the volume name; must consist of at least five characters. Once the current password is changed, the volume is password-protected. Subsequent access to the volume requires that you type the password in the Lisp System Tool window.

New Password:

New volume password, consisting of at least five characters.

NS File-Pathname:

Complete file path name of the Lisp sysout file to be retrieved from an NS file server (see the next section, "The Lisp System Tool", for examples of path names).

PUP File-Pathname:

Complete file path name of the Lisp sysout file to be retrieved from a PUP file server.

Floppy File Name:

The file name on the floppy disk from which the Lisp sysout file is to be loaded.

Local File Name:

The file name on the local rigid disk to which the Lisp sysout file is to be loaded.

Default Lisp Volume:

Sets the default volume on which the Lisp System Tool will operate.

Boot Volume for Stop Key:

The name of the volume that boots with the STOP key.

Copy VM from Volume:

The name of the logical volume (such as Lisp2) that will be the source of the virtual memory to be copied.

Copy VM to Volume:

The name of the logical volume to which the virtual memory will be copied.

Command Items

Set Profile!

Writes the parameter information entered in the Profile Tool window to the Lisp System Tool. (If you see a warning about "user.cm" anywhere on the screen, ignore it.)

Change Password!

Changes the password for the logical volume named in the **Volume Menu:** parameter. For the change to take effect, you must complete both the **Current Password:** and **New Password:** parameter items.

Note: 0-boots and STOP key boots will not work on a protected volume unless the last volume you were on was *Lisp*, in which case a 0-boot will return you regardless of password protection. To reset the password protection, change the volume password back to the volume name. Since a password must consist of at least five characters, you will not be able to reset the password for volumes with short names, such as *Lisp*.

Quit!

Closes the Profile Tool window. Unless you have selected either the **Set Profile!** or the **Change Password!** command items, no changes will be made to the parameter items of the Lisp System Tool.

The Lisp System Tool

The Lisp System Tool contains parameters and commands that help you manipulate Lisp sysouts and refresh your working Lisp environment. For information on setting default parameters, refer to "The Profile Tool" above.

Procedure:

● To activate the tool from the base state, press the left mouse button.

● Select the parameters you wish to set or change.

● Select the appropriate command.

● Confirm by pressing the left mouse button when the small mouse icon appears. Press the right mouse button to abort the command.

ENVOS: Lisp System Tool of 17-Aug-86 17:57

Document: (General, ErrorMsg) Device: (PUP-FS, NS-18, TcpFTP, Floppy, Local Disk)

File: (NSHost:Domain:Organization)Directory/SubDirectory/FileName.sysout

Volume Menu: Lisp	Volume Size = 25000	Free Pages = 10
Volume Password:	Max. VMem Size = 24975	VMem Size = 10029
Volume Boot File:		
User: User Name	User Password:	
Domain:	Organization:	

Sysin!	Erase!	Set Max VMem!	Make Script!	
Sysin & Boot!	List Files!	Copy VMem!	Scavenge!	Floppy!
Boot!	Help!	Quit!		

Figure 12. The Lisp System Tool Window

Parameter Items

The Lisp System Tool has the following parameter items:

Document:

Used in conjunction with the **Help!** command. Select the **General** document to display on-line documentation for the Lisp System Tool. Select the **ErrorMsg** document to display the meanings of the error messages you may encounter from commands in the File Subwindow. You can scroll the File Subwindow by positioning the mouse pointer on the left side of the subwindow and pressing the left or right mouse buttons to scroll up or down, respectively.

Device:

Device from which to install the Lisp sysout. This parameter also determines which of the default path names set in the Profile Tool will be used. For example, if you choose **PUP-FS**, then the file specified under **PUP File-Pathname:** in the Profile window is selected.

File:

The file path name of the Lisp sysout file to be retrieved from the selected device. The syntax of the file path name depends on the particular file system on your host machine. (Host names are never enclosed in the curly brackets generally used in Lisp.) If you have any doubt as the syntax used for your host machine, contact your system administrator.

On a local rigid disk, the file path name looks like

`<Volume>directory>FileName.sysout`

A typical example would be

`<Lispfiles>Myfiles>Lisp.sysout`

On a floppy disk device, the file path name looks like

`<Directory>FileName.sysout`

A typical example would be

`<MyOwn>Custom.sysout`

On a PUP file server, the file path name looks like

`[Host]<Directory>SubDirectory>FileName.ext!version`

A typical example would be

`[Rosebowl%]<Lisp>Lyric>Lisp.sysout`

On an (NS) file server, the file path name looks like

`(Host:Domain:Organization)Directory/SubDirectory/FileName.ext!version`

A typical example would be

`(Phylex:North:Organization)Demo/Demo.sysout`

An equivalent but shorter way would be

`(Phylex:)<Demo>Demo.sysout`

if the **Domain:** and **Organization:** parameters are set appropriately.

On a UNIX file server, the file path name looks like

`[host]</directory/subdirectory/>filename.ext`

A typical example would be

`[safe]</a/lisp/fugue4/>lisp.sysout`

On a VAX VMS file server, the file path name looks like

`[Host]Device:<Dir.SubDir>FileName.ext;version`

If you include a device name, you must also include a directory, even if the directory is empty.

A typical example would be

`[Taos]<DEIProd.Prior>Lisp.sys`

On a DEC-2060 TOPS-20 file server, the file path name looks like

```
[Host]<Directory.SubDirectory>FileName.Sys.version
```

A typical example would be

```
[Sumex-2060]<Dolphin.Lyric.BetaTest>Lisp.sysout
```

> Note: If you do not specify a version number, the most recent version is fetched.

Volume Menu:

Contains the menu of all the volume names when your disk is partitioned. Use the middle button to display the menu, then select the desired volume name. The volume name displayed here will be the object of all commands, such as **Erase!**, aimed at a specific logical volume.

Volume Size:

Shows the size, in pages, of the logical volume named by the **Volume Menu:** parameter.

Free Pages:

Shows the available free pages on the logical volume named by the **Volume Menu:** parameter.

Volume Password:

The password for the logical volume named by the **Volume Menu:** parameter. A string of asterisks is displayed instead of the actual password.

Max VMem Size:

Shows the maximum size of Lisp's virtual memory on the logical volume named by the **Volume Menu:** parameter.

VMem Size:

Shows the actual size in pages of the Lisp virtual memory on the logical volume named by the **Volume Menu:** parameter. This number should be

the same as returned by the function VMEMSIZE just before you log out of Lisp.

Volume Boot File:

Shows leader page note for the volume boot file, indicating the origin of the boot file. The Lisp System Tool and Installation Utility fill this in automatically.

User/User Password:

Your NS/PUP user and password names associated with Login to remote file server. (For PUP uses the name should be followed by a registry, for example, YourName.PA)

Domain/Organization:

Your clearinghouse domain and organization. If you do not use an NS file server, these parameters are irrelevant and should be left blank.

Command Items

Sysin!

Installs the file named in the **File:** parameter from the selected **Device:** into the logical volume named in **Volume Menu:.** If the operation is successful, the VMem file will be expanded to your volume size automatically. You can use the **Set Max VMem!** command to specify a new VMem size. This command can be aborted with the STOP key.

Erase!

Erases the contents of the logical volume specified by the **Volume Menu:** parameter.

Set Max VMem!

Alters Lisp's virtual memory file size on the logical volume named by the parameter **Volume Menu:.** Your VMem file is automatically created for you during the **Sysin!** operation. The local rigid disk file system tries to allocate contiguous space when the

file is first created. There are continuing performance penalties for accessing a fragmented file.

Make Script!

This command lets you set up your own customized disk partitioning. **Make Script!** brings up a new window for entry of volume names and sizes. You can specify as many as nine volumes (one volume is reserved for System Tools). To enter your partition, first select the disk type that corresponds to your disk. Your disk type should be 10, 29, 42, or 80 megabytes. The **Free Pages:** parameter will be updated automatically when you enter the next volume name. (See Figure 13.)

When partitioning a disk, it is imperative to use all the disk pages available, otherwise the physical volume may be unscavengeable. For this reason, the tool assigns all unallocated disk pages to the last logical volume.

When you are finished with the volume specification, select the **Make Script!** command (in the **Make Script!** subwindow, *not* the Lisp System Tools window) and you will be prompted to insert the *Installation Utility* floppy. At the end of the operation you will have added an entry to the Installer menu that appears when you boot the *Installation Utility* floppy. In order to actually repartition the rigid disk, you must boot the *Installation Utility* floppy and select the "USER SPECIFIED PARTITION" option in the Installer menu. (See "Partitioning" in Chapter 5, Software Installation.)

Note: Making a copy of your *Installation Utility* floppy and using the copy for the above operation is highly recommended.

Sysin & Boot!

Performs the Sysin function and, if no errors occur, boots the system.

List Files!

Enumerates all the files on the specified file path name that matches the wild card. There are two wild card characters: * matches zero or more characters; # matches exactly one character.

Copy VMem!

Copies the Lisp virtual memory from one logical volume (Source) to another logical volume (Destination). This command does not copy the entire contents of the logical volume, but only the number of pages specified by the **VMemSize:** parameter of the source volume. The **Copy VMem!** command brings up its own window, whose parameters and commands are explained below.

Source Volume:

Enter the name of the logical volume that is the source of the VMEM you want to copy.

Dest. Volume:

Enter the name of the logical volume to which you are copying the VMEM.

Source Volume Password:

Dest. Volume Password:

If either the source or the destination volume is password-protected, you must enter the appropriate password(s).

Start!

Starts copying the virtual memory. After you select **Start!** a mouse icon appears. Press the left mouse button to confirm the copy operation or the right button to abort the command. When the virtual memory has been

copied, you can respond affirmatively to the confirmation message and boot the Destination volume, or you can cancel the boot and **Quit!**.

Quit!

Removes the Copy VMem Subwindow.

Scavenge!

Scavenge performs a logical volume scavenge on the volume named in the parameter item **Volume Menu:**. Use this command whenever you suspect the integrity of your disk volume. It is part of the local file system's error recovery process. (See "Disk Scavenging" in Chapter 4, File System.)

Floppy!
Floppy disk utility. Brings up the Floppy Tool Subwindow (see Figure 13) with several options.

Pattern:

The search pattern for files stored on the floppy. See **List!**, below.

Floppy Name:

The name you gave the floppy when it was formatted.

Info!

Displays floppy name, single or double density, single or double sided, number of free pages and largest free block. Automatically fills in the **Floppy Name:** field.

List!

Lists files as called for in **Pattern:** field. The wildcards * and # are allowed.

Format!

Formats the floppy, giving it the name specified in the **Floppy Name:** field.

Using TCP FTP with the System Tool

The Lisp System Tool supports sysout and microcode installation using the TCP FTP protocol (not to be confused with TFTP). You use this feature by selecting the "TCP/FTP" device type in the main System Tool window.

In order to understand some of the instructions and requests for information contained below you should have a working knowledge of TCP. If you do not have such knowlege please consult with your system administrator.

Setting TCP Parameters Using the Profile Tool

Before using TCP, you must set up certain parameters that TCP needs for its operation. You set parameters using the Profile Tool. At the bottom of the Profile Tool's parameter subwindow are several new fields under the boxed item labeled "-- TCP Setup Options --". See Figure 11. These items are used to specify the information that TCP needs to function. They are:

- **Host Address**: The TCP/IP address of your machine. If you have already been using TCP/IP in Lisp, it is a good idea to use the same address.

- **Gateway Address**: The TCP/IP address of a gateway connected to your network. This may be left blank or specified as the null address (0.0.0.0) if you do not need to go through a gateway.

- **Subnet Mask**: The subnet mask to be used.

- **Name Server**: The TCP/IP address of your domain name server.

Once you have filled in the correct values, select the **Set Profile!** command so that they will be recorded

Duplicate!

Duplicates a floppy. This command will only work if there is a rigid disk volume available with at least 700 free pages.

Quit!

Closes the Floppy Tool Subwindow.

Boot!
Boots the volume specified by the **Volume Menu:** parameter. Press the F1 key when the boot icons appear.

Help!
Displays on-line help and error messages.

Quit!

Deactivates all windows and returns to the bouncing rectangle.

Fetch Lisp Microcode!

Fetches microcode from the file specified by the **File:** parameter and installs it on the logical volume named by the **Volume Menu:** parameter.

ENVOS: Make Script

DiskType: (10Mb, 29Mb, 42Mb, 80Mb)
Drive Size= 139218   Free Pages= 135018
Volume 1: SystemTools   Volume 1 Size = 4200
Volume 2:   Volume 2 Size = 0
Volume 3:   Volume 3 Size = 0
Volume 4:   Volume 4 Size = 0
Volume 5:   Volume 5 Size = 0
Volume 6:   Volume 6 Size = 0
Volume 7:   Volume 7 Size = 0
Volume 8:   Volume 8 Size = 0
Volume 9:   Volume 9 Size = 0
Volume 10:   Volume 10 Size = 0

Make Script!   Quit!

ENVOS: Copy VMem

Source Volume: Dest. Volume:
Source Volume Password: Dest. Volume Password:
Start!
Quit!

ENVOS: Floppy Tool

Pattern:
Floppy Name:
Info!   List!   Format!   Duplicate!   Quit!

Figure 13. The Make Script, Copy VMem, and Floppy Subwindows

The On-Line Diagnostics Tool

The programs for these on-line diagnostics tests are stored on the System Tools Volume, and are accessible from the base state (bouncing white rectangle). There are tests for the Display, Keyboard, Echo Test (Ethernet), RS-232 Loopback, Floppy Drive and Ethernet Statistics.

All the tests are documented on-line and can be accessed with the the **Help!** command.

Procedure:

● To activate from the base state, press the right mouse button.

● Select the test to be executed.

● Select the parameter(s) for the test.

● Select the **Start!** command.

● Select **Help!** for documentation.

To read all the documentation, you may find it convenient to adjust the height of the File Subwindow before you select **Help!**. To do this, position the cursor over the small box at the right of the line that divides the File Subwindow from the other subwindows. Press the left mouse button and, while holding it down, move the cursor up or down to adjust the boundary line.

If you select the wrong test, or if a test runs continuously, you can stop it by pressing the STOP and KEYBOARD keys.
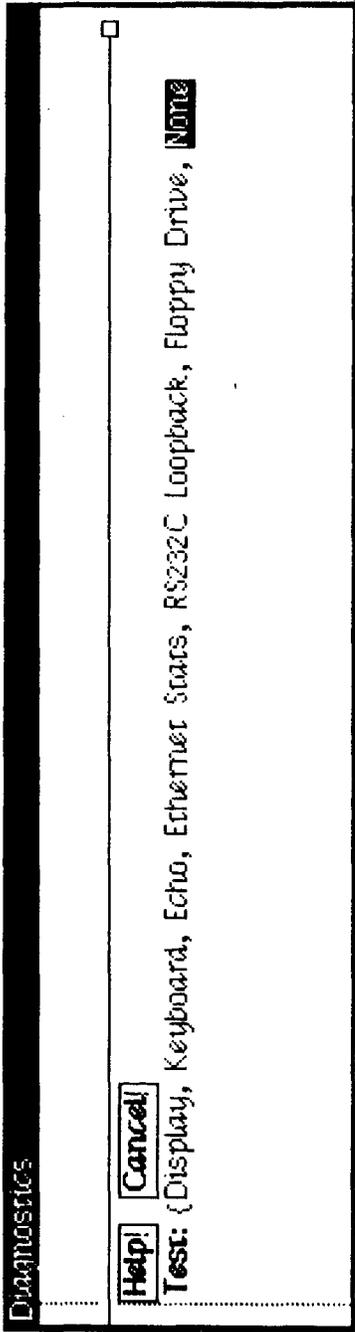
Figure 14. *The Diagnostics Window Image*

Parameter Items

Types of tests available:

Display, Keyboard, Echo, Ethernet Stats, RS-232 Loopback, Floppy Drive

For details, please see the on-line documentation before starting these tests.

Command Items

Help!

Used with parameter "None", displays the complete documentation on how to use the Diagnostics window, including the Window Manager. Used with one of the test parameters, displays the complete documentation for that test.

Start!

Start the selected test. The **Start!** command only appears after you have selected one of the tests.

Cancel!

Closes the Diagnostics window and returns to the base state (bouncing white rectangle).

Input/output on the Xerox 1108 is supported in many ways: by keyboard, display, mouse, rigid disk, Ethernet, floppy disk, and RS-232 communications. This chapter covers aspects of the floppy disk and RS-232 communications.

Note: All the Lisp expressions and functions in this manual are in Interlisp. Therefore, you must either type them into an Interlisp Exec window or preface them with the characters *IL:* if you type them in any other Exec window. See Chapter 1, Introduction, for details.

Floppy Support

This section describes Xerox Lisp's file device {Floppy}, which is used to interact with floppy drives on Xerox 1108 machines.

Use a double-sided, double-density, soft-sectored, eight-inch floppy disk (two kinds that work are Datalife #18071 and Dysan #800803-02). Insert the floppy into the floppy drive face up, the edge of the floppy with two two-inch-long cover holes (one hole per side) going in first. The write-protect notch will be on the same edge as and to the left of a cover hole as you look down on the floppy from above.

Note: Write protect this type of floppy by EXPOSING the write-protect notch. This is just the opposite of the normal convention for $5\frac{1}{4}$ inch floppies.

In general, Xerox Lisp can be used to read, write, and otherwise interact with files on Pilot-formatted floppy disks through standard Interlisp input/output functions. (The 1108's processor uses

the Pilot Operating System file format.) All familiar operations such as LOAD, OPENFILE, READ, PRINT, BIN, BOUT, GETFILEINFO, SETFILEINFO, GETFILEPTR, SETFILEPTR, and so on, work with floppies. COPYFILE is commonly used to archive and unarchive files between floppies and other file devices. Files on floppies can be compiled, edited, hard-copied, and so on, just as files may be on all other ordinary file devices.

Naming, Erasing, and Formatting Floppies

To erase and establish track information on a floppy, especially a floppy that is brand-new, call

(FLOPPY.FORMAT *NAME AUTOCONFIRMFLG SLOWFLG*)   [Function]

The *NAME* argument becomes the name of your floppy. It can be any string or atom of 106 or fewer characters. It is a good idea to label the outside of your floppy with the same name, using a sticky label and a soft marker.

AUTOCONFIRMFLG controls whether you are prompted before the system lets you destroy the contents of a floppy that appears to contain valid information. If *AUTOCONFIRMFLG* is T, you will not be asked to confirm.

SLOWFLG determines how thorough a formatting job is to be done on the floppy you format. If *SLOWFLG* is T, FLOPPY.FORMAT completely erases your floppy, setting down track information and critical Pilot records on it. When *SLOWFLG* is left NIL, only the Pilot records needed to give your floppy an empty directory are written. Use *SLOWFLG* = T with a brand-new floppy.

Typically you will leave *AUTOCONFIRMFLG* and *SLOWFLG* as NIL. For example, doing

(F LOPPY . FORMAT "My F1oppy")

will create a blank floppy named "My Floppy."

To reset the name put onto a floppy by FLOPPY.FORMAT, use

(FLOPPY.NAME *NAME*)   [Function]

If *NAME* is NIL, then FLOPPY.NAME reads the name put onto a floppy by FLOPPY.FORMAT or FLOPPY.NAME.

Copying Floppies

The ability to copy Pilot floppies is supported through two functions:

(FLOPPY.TO.FILE *TOFILE*)   [Function]

(FLOPPY.FROM.FILE *FROMFILE*)   [Function]

FLOPPY.TO.FILE copies the contents of the current floppy to a file, and FLOPPY.FROM.FILE is the inverse of FLOPPY.TO.FILE. For instance, to copy the contents of one floppy onto another, insert the floppy to be copied into the floppy drive. Then type

(FLOPPY.TO.FILE 'ToFile)

Remove the first floppy and insert a blank floppy. Type

(FLOPPY.FROM.FILE 'FromFile)

The first floppy has now been copied.

The *TOFILE* produced by FLOPPY.TO.FILE is approximately 2,500 pages long and can be placed on a file server or a logical volume of your machine. FLOPPY.FROM.FILE can be used more than once if you would like to make more than one copy. As an alternative to using FLOPPY.SCAVENGE (described below), you can edit the *TOFILE* produced by FLOPPY.TO.FILE to salvage the contents of a floppy that has been damaged.

Archiving to Floppies

Two special functions make archiving to floppies exceptionally easy:

(FLOPPY.ARCHIVE *FILES NAME*)   [Function]

(FLOPPY.UNARCHIVE *HOST/DIRECTORY*)   [Function]

FLOPPY.ARCHIVE formats a floppy inserted into the floppy drive, giving the floppy the name *"NAME#1."* FLOPPY.ARCHIVE then copies each file in Files to the freshly formatted floppy. If necessary, FLOPPY.ARCHIVE overflows onto successive floppies, which it names *NAME#2, NAME#3,* and so on, each time prompting you to insert a new floppy. It is very convenient to archive an entire directory or subdirectory using FLOPPY. ARCHIVE in conjunction with Xerox Lisp's DIRECTORY function. For example, typing

```
(FLOPPY.ARCHIVE           (DIRECTORY           '{Server}
<User>Project>*)  'Project)
```

copies all files on {Server}<User>Project> to floppies.

FLOPPY.UNARCHIVE is the inverse of FLOPPY.ARCHIVE. FLOPPY.UNARCHIVE copies all files on the current floppy to the directory {Host}<Directory>. Thus, typing

```
(FLOPPY.UNARCHIVE  '{Server}<User>Project>)
```

copies each file on the current floppy to the directory {Server}<User>Project>. If there is more than one floppy to unarchive, you should separately FLOPPY.UNARCHIVE each floppy. (FLOPPY.UNARCHIVE does not require a floppy originally created by FLOPPY.ARCHIVE.)

Loading Sysouts and Other Large Files Onto Floppies

You can create sysouts on floppies with Xerox Lisp's SYSOUT or MAKESYS functions, then later install them on the same or another Xerox 1108 with the System Tool. Sysouts may also be taken from other file devices and put onto floppies with FLOPPY.MODE (see below). To copy a sysout to floppies, use one of the following functions:

(SYSOUT '{FLOPPY})   [Function]

(MAKESYS '{FLOPPY})   [Function]

You are prompted to insert new floppies as they are needed. Unless you specify otherwise, the default name for the sysout will be LISP.SYSOUT; the floppies will be named *Lisp Sysout #n* (where *n* is the number from 1 to the total number of floppies required). It generally takes three to five floppies to store a sysout. To load in a sysout from floppies, you can use the Lisp System Tool.

The normal mode of operation for {FLOPPY} is

(FLOPPY.MODE 'PILOT)   [Function]

Two special modes of operation for floppies, SYSOUT and HUGEPILOT, are also available. You can put floppies into either mode to copy sysouts or huge files from file servers to floppies or from floppies to file servers.

Note: It is generally advisable to copy sysouts to floppies in SYSOUT mode because other modes assign version numbers to the new sysout files. This can confuse the Lisp System Tool.

In SYSOUT mode, you can use COPYFILE to move a sysout from another file device onto floppies. To do this, you must first set the floppies to SYSOUT mode, then do the COPYFILE. For example,

(F L O P P Y . M O D E   ' S Y S O U T)

```
(COPYFILE '{FileServer}<Directory>LISP.SYSOUT
'{FLOPPY})
```

> puts the current Xerox Lisp LISP.SYSOUT onto floppies. While in SYSOUT mode, you can copy as many sysouts as you like onto floppies, then use the *Installation Utility* flopy to load these sysouts onto a Xerox 1186. Similarly, sysouts can be copied from floppies onto another file device with COPYFILE when in SYSOUT mode. For example,

```
(FLOPPY.MODE 'SYSOUT)
```

```
(COPYFILE '{FLOPPY}
'{YourFileServer}<YourDirectory>Your.Sysout)
```

> copies the sysout onto your directory on a file server. To get back to ordinary floppy operation, type

```
(FLOPPY.MODE 'PILOT)
```

> You can write and read huge Pilot files (like IRM.hashfile) from multiple floppies to, for example, your local rigid disk in HUGEPILOT mode, which you set by typing

```
(FLOPPY.MODE 'HUGEPILOT)
```

```
(COPYFILE '{FLOPPY}FileName '{DSK}FileName
```

> This mode is practically identical to SYSOUT mode, except that you have control over the names of files and floppies.

Using CPM-Formatted Floppies

> CPM is an operating system that runs on some smaller computers. If those computers also have eight inch floppy drives, like the Xerox 820-II, they can trade information with Xerox 1108 machines via CPM-formatted floppies. There are a number of CPM formats, but single-density single-sided (SDSS) CPM is standard. You can create, read, and write SDSS CPM-formatted floppies on 1108 machines.

CPM-formatted floppies are formatted differently than Pilot floppies, so be sure to use FLOPPY.MODE to switch to CPM mode when planning to work with CPM floppies. To create, read, or write CPM-formatted floppies, switch to CPM by typing

(FLOPPY . MODE   'CPM)

After switching to CPM mode, you can use FLOPPY.FORMAT to create CPM-formatted floppies.

When the IOP (Input/Output Processor) is in CPM mode, the usual input/output operations work with CPM-formatted floppies just as they do with Pilot-formatted floppies when you are in PILOT mode. There are a few limitations, however: CPM file names are limited to eight or fewer characters, with extensions of three or fewer characters; they do not have directories or version numbers; and CPM files are padded out with blanks to make file lengths multiples of 128 characters.

To switch back to ordinary floppy operations, type

(FLOPPY . MODE   'PILOT)

This takes you out of CPM mode and puts you into PILOT mode, and lets you resume formatting, reading, and writing ordinary Xerox Pilot floppies.

Measuring Unused Floppy Space

The following function tells you how much space is left on a floppy.

(FLOPPY.FREE.PAGES)   [Function]

returns the number of free pages on the current floppy. Pilot floppy files are represented contiguously on a floppy disk. If you are using your floppy interactively (not just doing a simple series of COPYFILE commands after a FLOPPY.FORMAT), do not fill your floppy to capacity. Try to keep such a floppy less than 75 percent full.

Testing Whether a Floppy is in the Drive

There are three functions available for testing whether a floppy is in the floppy drive.

(FLOPPY.CAN.READP)   [Function]

tests whether there is a floppy in the floppy drive. It does not provide any protection against not fully closing the floppy drive door.

(FLOPPY.CAN.WRITEP)   [Function]

tests whether there is a floppy in the floppy drive and whether the floppy drive can write on this floppy.

(FLOPPY.WAIT.FOR.FLOPPY NEWFLG   [Function]

When NEWFLG is NIL, this command waits until a floppy is in the floppy drive before returning. When NEWFLG is T, the function first waits until the existing floppy in the floppy drive, if any, is removed; then it waits for a floppy to be inserted into the drive before returning.

Scavenging Floppies

(FLOPPY.SCAVENGE)   [Function]

attempts to repair a floppy whose critical records have become confused. Also, if you accidentally delete floppy files, FLOPPY.SCAVENGE retrieves them (unless you wait until they have been overwritten by new files).

RS-232 Support

There are two ports on the Xerox 1108 capable of supporting RS-232 communications: the TTY port (which is standard equipment) , and the RS-232-C port, (which is the E30 equipment option). Both

ports exit the machine chassis at the rear, in female 25-pin D-shell connectors. The E30 option will have a label like

J11

or

RS-232

for its associated connector. The TTYPort will be labeled either

Printer/DTE

or

Printer

K/B - Terminal

Cable Configurations for RS-232-C Port and TTY Port

There are several cable configurations for use with the RS-232 and TTY ports. Since the 1108 has female connectors for both ports, all cables must terminate with the corresponding male connector (25- pin DB-25) on the 1108 side.

The four most often used configurations are:

- RS-232 to modem

- RS-232 to printer

- TTY port to printer

- modem eliminator (which allows two 1108 machines to communicate direction through the RS-232 or TTY ports)

For further details, see RS-232 documentation in the *Lisp Library Modules Manual.*

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8. DIAGNOSTICS

Diagnostics are software programs that show how well the workstation hardware is operating and help to locate problems. Run diagnostics when you need to recover from hardware errors. These are indicated by error codes displayed on the Maintenance Panel (MP). For a complete listing, see Chapter 9, MP Codes.

Using the Fixed Disk Diagnostic Floppy

The *8000 Series Rigid Disk Diagnostics (10, 29, 42 MB) 8.0* floppy is used to test and diagnose faults in the 1108 processor. When troubleshooting problems with the Input/Output Processor, Memory Control and Storage Cards, the Central Processor, and the rigid disk, Xerox service personnel can execute these tests selectively and interactively.

However, you can load and execute these tests automatically by loading the *8000 Series Rigid Disk Diagnostics (10, 29, 42 MB) 8.0* floppy and performing a 5-boot. Refer to "Booting the 1108" in Chapter 3, Using the 1108, for booting instructions.

The *8000 Series Rigid Disk Diagnostics (10, 29, 42 MB) 8.0* floppy can also be used to set the time on a standalone Xerox 1108 and to copy floppy disks.

Starting Automatic Load and Go (ALAG)

ALAG is a sequence of automatic diagnostic tests that help you to identify 1108 problems. You can initiate it by inserting the *8000 Series Rigid Disk*

Diagnostics (10, 29, 42 MB) 8.0 floppy and performing the Alternate 5-boot. ALAG cannot be initiated from the rigid disk.

The Alternate 2-boot eliminates ALAG and enters Rigid Disk diagnostics.

Boot Diagnostics for Standalone Workstations

During the Boot Diagnostics, the system attempts to set the time from a time server on a network. If your 1108 is a standalone system, this attempt will halt and the Maintenance Panel will flash code number 0322, alternating with 0002. Simply press the ALT B button to bypass 0322 and skip to 0323. Execution will continue without further interruption. Later, several more patterns will flash on the screen; the Memory diagnostics will run for about one minute (MP code 0645), and a series of messages will appear. If any other MP codes appear during diagnostics, or if you suspect a hardware problem, contact your system administrator. The normal messages are:

Locating Time Server. . .failed

Please enter local time parameters

Time zone offset from Greenwich (-12 -12):

　　Type -8 for PST, for example.

Minute offset:

　　Press < RETURN >

Day of DST (0-366):

　　Press < RETURN >

Last day of DST(0-366):

　　Press < RETURN >

The correct date and time are displayed, and you are prompted:

Do you want to change the time

Confirm (Y/N):

If the time is correct, type "N".

The system then responds with the following display (where nn indicates a 10, 29 or 42 megabyte rigid disk.)

nnMegabyte Storage Diagnostic Program 5.0

>Fault Analysis

MP Code:1n99

Examining Physical Volume

>Media Scan

>List New Bad Pages

No new pages

Successful completion

The MP reads 1499 for successful completion of the 42 and 80 MB Disk configuration, 1799 for the 29 MB, and 1199 for the 10 MB.

You can press STOP during any test to cancel that test, to change your test parameters, or to terminate testing.

Return to the last logout of Lisp from the *8000 Series Rigid Disk Diagnostics (10, 29, 42 MB) 8.0* by typing Boot or by pressing B RESET.

Failures in ALAG

If ALAG fails during Boot, Utility or Disk tests, the MP will alternate between the failing test number and an error code. Your system administrator or Xerox service representative will take appropriate action based on the meaning of these failures.

If your display reports the rigid disk error message *New Pages*, make note of the pages and call the system administrator or service representative.

9. MP CODES

There are two types of Maintenance Panel codes: progress codes and error codes. Progress codes appear in the maintenance panel at various stages of initialization. Error codes are traps which freeze or blink the error number in the maintenance panel. All errors except the 9000-range errors are fatal.

All MP codes lower than 9000 are generated by non-Lisp programs implemented directly in microcode or in Mesa, a high-level programming language used at Xerox. MP codes from 9000 to 9999 are generated by an error in the Lisp system code. A summary of all possible MP code ranges is presented below. However, only those MP codes likely to arise during operation of a Lisp workstation are identified in this document.

Summary of Maintenance Panel Code Ranges

0000-0199	Pre-boot Diagnostics
0200-0499	Boot Diagnostics
0500-0699	Input Output Processor
0700-0899	Disk Diagnostics (written in microcode)
0900-0999	Pilot Operating System
1000-6999	Hardware Diagnostics
7000-8887	STAR
8888-8888	MP Lamp Test
9000-9999	Lisp

Pre-boot Diagnostics

0000 - 0199 Pre-boot Error Codes

0096	Insufficient real memory (<1MByte) for Lisp
0149	Usually right after power-on. Disk not ready. Safe and effective to 0-boot from this state.

Boot Diagnostics

0200 Boot Diagnostics Progress Code

0200	Normal booting phase 2

0201 - 0299 Boot Diagnostics Error Codes

0201	CP error in reading from boot device (to recover, try hitting B-RESET once or twice)
0202	Null Mesa germ installed in physical volume
0203	Broken rigid disk boot chain (possibly intermittent)
0204	Illegal IOP port command
0205	CP Trap (CS parity or double-bit memory error)
0206	Null diagnostic microcode in physical volume
0207	Null Pilot/Mesa emulator microcode in physical volume
0208	Null Mesa germ installed in physical volume
0217	Inconsistent Virtual Memory. Requires reinstallation or try another partition.

0322 (alternating with code 0002) Trying to set time from network timeserver, but machine is not connected to network. Press ALT B to bypass 0322 and proceed to 0323. See "Boot Diagnostics for Standalone Workstations" in Chapter 8, Diagnostics.

Input/Output Processor Codes

0500 - 0502 Domino Progress Codes

Domino is the program that runs in the Input/Output Processor (IOP) and handles the floppy disk, keyboard, mouse and RS232.

0500	StartDomino	Domino has started
0501	InitReadTOD	Domino starting to read the TOD clock
0502	InitReadTODdone	Reading of TOD clock completed (next MP number from Lisp)

0505 - 0599 Domino Error Codes

0505	CSParity	CS parity error was detected
0506	BurdockCPDisabled	Burdock attempted to use EtherKludge
0507	CPBurdockDisabled	CP attempted to use EtherKludge
0508	IOPBreak	An IOP break with no IOP kernel
0509	IllegalIOPIntr	Illegal IOP interrupt
0510	BadMapEntry	Incorrect vm Map entry in IOP access.

0511	NoCPDmaComplete	CP DMA operation failed to complete
0512	NoCPDmaChannel	CP DMA channel not specified
0513	ReadCPPortDead	CP not responding to Read CPPort
0514	WriteCPPortDead	CP not responding to Write CPPort
0520	StackOverflow	A task's stack has overflowed
0565	InvToneCmd	Invalid keyboard tone generator command
0570	InvProcCmd	Invalid command value in Processor CSB
0571	UnImplCmd	Unimplemented command in Processor CSB
0572	SetTODError	The Time-Of-Day could not be set
0576	LSEPCtlOVR	LSEP Control CSB overrun
0580	NoValidCommand	Invalid floppy IOCB command
0581	UnImplFloppyCmd	Unimplemented floppy IOCB command
0582	InvalidEscapeCmd	Invalid Escape floppy command
0583	CommandTrack	Floppy track register is not correct
0584	TrackToBig	Floppy track number is too large
0585	BadDmaChannel	Couldn't program Floppy DMA

0586   NoDmaEndCount1   External   DMA   End
        Count not set

0587   NoDmaEndCount2   Internal   DMA   End
        Count not set

Pilot Operating System Codes

The Pilot Operating System is used only during operation of the Installation Utility and the Lisp System Tool.

0900 - 0999 Pilot Error Codes

0915   Pilot breakpoint: Can signify any number of problems, such as: bad page on the rigid disk, cannot read the floppy disk, or a hardware failure. To recover, try running ALAG. If ALAG passes and its Media Scan test shows no new bad pages, the floppy disk (software installation) is suspect.

0935   Need Ethernet debuggee server but boot loader lacks this capability.

0937   Trying to find out the time and date: Pilot will hang in this state if no time server is responding and the time has not been set on the machine since power-up. Time can be set from within Lisp (with SETTIME), by 2-booting the Installation Utility floppy, or by 5-booting the EI Fixed Disk Diagnostics floppy.

0948   System physical volume needs scavenging.

0950   Logical volume being scavenged. The amount of time required depends on the size, occupancy and fragmentation of the logical volume.

0981   Trying to discover Ethernet Pup host number: Will hang in this state if non-Lisp

code tries to perform Pup operations and no Pup ID Server responds, or processor ID is not registered. See network administrator.

Lisp Codes

9000 -9299   Xerox Lisp Microcode Error Codes

Most of these errors are indicative of some serious problem; Lisp software attempts to cause regular breaks when these occur.

9001	CSParErr	Control store parity error; a hardware error
9002	StackErr	Hardware stack overflow
9003	IBEmptyErr	Instruction fetch unit empty error
9004	VirtAddrErr	Attempt to reference virtual address >22 bits
9005	EmuMemErr	Double bit memory error or non-existent memory
9009	CAR/CDR	bad pointer
9013	NegPcError	Inconsistent PC at FnCall
9014	applyUfn	Arg to apply not integer
9016	notFreeTrap	Stack allocation error
9024	-	Page fault in the page fault handler
9048	-	ReFOvr page fault under page fault
9049	-	Ghost context switch
9051	BadUfnTable	An entry in \UFNtable is invalid

9120	MiscErr	Misc. Opcode; no such register
9121	MiscErr	Misc. Opcode; bad 2nd byte
9122	MiscError Input	Misc. Opcode; no such register
9126	PcNegError	Inconsistent PC at Punt
9127	PcNegError	Inconsistent PC at Punt
9136	CycleMask	Bad caller
9129	M1Loc	Microcode error
9130	M2Loc	Microcode error
9131	M3Loc	Microcode error

9300 - 9399 Lisp System Error Codes

These codes generally indicate an error state in Lisp system code that cannot be handled in the break module. Most are unexpected and indicate a serious error. It is possible to use the TeleRaid module (described in the *Lisp Library Modules Manual*) to find out more information, providing you have a networked machine with other 1108 machines on the same network. To become a Teleraid server (and allow other machines to look at your state), press the UNDO key. When the cursor changes into "TeleRaid", go to another machine and run the TeleRaid user.

Even if you can't use TeleRaid, you can convert several of these codes into a Lisp break, providing the state of the system is reasonably consistent and the error occurred under user code (rather than, say, the garbage collector.) To attempt to enter a break, type PROP'S-B. Some other options are described below, followed by the list of the Lisp system codes.

Summary of TeleRaid server commands:

PROP'S-B   Attempt to enter Break. If error is in a special system context, will change cursor to "CANT", indicating refusal to enter break.

PROP'S-D   Perform Hard Reset-clear stack, flush all non-restartable processes.

PROP'S-N   Continue from error. This is usually not possible, except for code 9318, or when you got a 9915 error by typing PROP'S-C while the Raid interrupt was enabled.

PROP'S-P   Display PUP host number (in decimal) on maintenance panel.

The 9300 Series Codes are:

9302   Invalid Vmem. Indicates an attempt to boot an image that is not a valid Lisp sysout, or which is inconsistent from having some, but not all, of its dirty pages written. Can happen if you boot instead of calling LOGOUT. Usually caught sooner as code 0217.

9303   Insufficient memory (less than 1.5 megabytes) available for IOCB page at startup.

9304   Map out of bounds. Indicates an attempt to use a pointer larger than the virtual address space of the machine. Usually means garbage was fetched from somewhere that should have contained a pointer. Sometimes indicates a disk error.

9305   Invalid address. Indicates an attempt to use a pointer that does not refer to an existing (allocated) part of virtual memory. Usually means garbage was fetched from somewhere that should have contained a pointer. This error can often be converted

to a break with the PROP'S-B TeleRaid command.

9306   Invalid virtual page.

9307   Unavailable page on real page chain: Signals an inconsistent state in page fault handler.

9308   Loop in \SELECTREALPAGE. Signals an inconsistent state in page fault handler.

9309   Attempt to allocate already existing page (from call to \NEWPAGE).

9310   \DONEWPAGE failed to allocate new map page.

9311   Locked page occupies a file page needed to lock another. Signals a bad state in virtual memory system.

9312   Arg to CLOCK0 not an integer box.

9313   Fault on resident page. Processor took a page fault for a page that appears to be resident.

9314   PageFault on stack. Shouldn't happen, as stack is resident.

9316   Obsolete. Attempt to extend VMem beyond 8MB.

9317   Attempt to write a locked page when not under \FLUSHVM. Bad state in virtual memory system

9318   Error in uninterruptable system code. An error that ordinarily would enter a break (e.g., a type test failure), but in a piece of code that should not be user-interruptable. This is generally a sign that some datum used by system code has been smashed, but this is not always fatal. If you cannot diagnose the error with TeleRaid, type PROP'S-N after entering the TeleRaid

server; Lisp will go ahead and attempt to enter at the break anyway, from which (if it succeeds) you might be able to glean more information about the problem.

9319   Stack full. Signals a hard stack overflow. A soft stack overflow (Lisp break "STACK FULL") occurs when the stack is mostly used up; if you proceed beyond that point without resetting, you can completely fill the stack and get this code. Press STOP to perform a HARDRESET to clear the stack, or run TeleRaid to find out what caused the stack to overflow.

9320   MDS full. Storage space is completely exhausted. A continuable Lisp break "STORAGE FULL" occurs when MDS is nearly full.

9321   Unknown UFN. Indicates an attempt to execute an unimplemented opcode. This usually means that the processor is trying to execute random memory, or took a wild jump somewhere. Can be a microcode or hardware error.

9322   Atoms full. The limit on number of litatoms (2^{16}) has been reached. A continuable STORAGE FULL error will occur first.

9323   Pnames full. There is no more space for storing the pnames of litatoms. This is unlikely to occur unless you create an extraordinary number of litatoms with very long pnames.

9324   Stack frame use count overflow. The program has attempted to create more than 200 references to the same stack frame.

9325   Storage nearly full. This is a warning that comes later than the "STORAGE FULL" break, but before you completely run out

(and get a 9320). You can continue from this error with PROP'S-N from TeleRaid.

9326   Bad MDS free list. The free list of recycled MDS pages got trashed. You can continue from this error with PROP'S-N from TeleRaid.

9327   Bad array block. The array allocator found a bad array block in its free list. Generally means some unsafe code trashed one or more locations in array space.

9328   A variation on 9327.

9329   The garbage collector attempted to reclaim an array block, but the block's header was trashed. You can continue from this error with PROP'S-N from TeleRaid, but it is symptomatic of array trashing, and you should save your state as soon as possible and restart in a good sysout.

9330   Reference counting problem: an object marked as having a overflowed reference count is not found in the overflow table.

9331   Reference counting problem: an object whose reference count just now overflowed was already in the overflow table.

9332   Reference counting problem: an attempt was made to decrement the reference count of an object whose reference count was already zero.

9333   One of a number of consistency checks in the process manager failed.

9334   The process manager needed to build a function frame for some operation, but failed. This normally should never happen, but could conceivably if you are about to completely fill up the stack (and thus would otherwise get a 9319 error).

9335 Occurs at boot time when the sysout you are trying to run uses the full 32MB virtual address space, but you are trying to run it on a machine that can only address 8MB. The function 32MBADDRESSABLE reports whether a machine has the hardware required to address 32MB.

9336 Somehow control was transferred to the T frame at the top of the world (effectively a (RETTO T), except that RETTO turns that case into a RESET), thereby evading the process world. This leaves the stack in an unresumable state.

9337 The process that is being scheduled to run next has had its stack released—inconsistent state in the process scheduler.

9338 through 9340
 Error in locked page logic—not currently used.

9341 Hard disk error in swapper. The swapper has tried several times to access a page of the virtual memory backing file and failed; page fault cannot proceed.

9342 Disk run table for the virtual memory backing file is malformed.

9400 - 9899 Unassigned Codes

9900 - 9924 Raid or Alto Error Codes

These codes are displayed when an attempt is made to call Raid, or the Alto operating system. The only one that is likely to ever occur is 9915, call to RAID.

Note: If you have the Raid interrupt enabled (by default on PROP'S-C), you will get a 9915 error by typing that interrupt character.

9905 NOOPSUBR

9906 \BACKGROUNDSUBR

9907 \CHECKBCPLPASSWORD

9908 DISKPARTITION

9909 DSPBOUT

9910 \DSPRATE

9911 \GATHERSTATS

9912 \GETPACKETBUFFER

9913 \LISPFINISH

9914 \MOREVMEMFILE

9915 RAID

9916 \READRAWPBI

9917 \WRITERAWPBI

9918 SETSCREENCOLOR

9919 SHOWDISPLAY

9920 \PUPLEVEL1STATE

9921 \WRITESTATS

9922 \CONTEXTSWITCH

9923 \COPYSYS0SUBR

9924 \WRITEMAP

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for future use. If you are unsure of any of these values, ask your system administrator for help.

Setting Default Path Names

In addition, you may specify a default file pathname to be used by entering it in the "TCP FTP File-Pathname" field of the Profile Tool and selecting **Set Profile!**.

The file pathname to be used is given by putting the host name or address in square ([]) brackets, immediately followed by the file pathname in whatever form is required by the FTP server being used. For example, on a local Unix host, one could use either of the following pathnames: "[python]/usr/lisp/medley/basics/full.sysout", or "[13.2.73.1]/usr/lisp/medley/basics/full.sysout".

Using Host Names—The Local TCP/IP Host Table

If you wish to use host names instead of addresses when fetching files, you must also initialize the local TCP/IP host table. The SystemTools partition does not have enough room for a full ARPA host table, nor is it likely that more than a few FTP servers will be used for sysout storage. The host table is initialized by filling out a form that is brought up by selecting the **Edit TCP Host Table!** command in the Profile Tool window.

This command opens a new window that consists of three subwindows: a message window, a window with the commands **Write Host File!** and **Quit!**, and a window with five pairs of "Host Name" and "Address" fields. If there is a host table currently on the SystemTools partition, these fields will be initialized with the values therein. Once you have entered the changes you want to make, select **Write Host File!** to overwrite the host table with the current contents of the window. The **Quit!** command closes the window without making any further changes to the host table.

Using the System Tool with TCP FTP

Once you have set up TCP/IP as described above, select the TcpFTP device in the main System Tool window. See Figure 12. You may now list files, install sysouts or install Lisp microcode.

The TCP FTP protocol does not provide some features that both Pup and NS Filing do which affects the operation of the System Tool in the following ways:

- File listings are always done in the verbose mode, and use whatever format is provided by the server.

- The intermediate feedback (i.e., the number of bytes transferred) while retrieving a file may be misleading because, in general, there is no way to find out the size of a file to be transferred. The *final* byte count reported is accurate.

- Since the file size is not known, if there is not enough room for the file, you will not know this until after it has been partially fetched. This may take a while in the case of a sysout. For a sysout, the maximum size of the file will be taken as the maximum VMem size for the volume; for Lisp microcode, the maximum size is 260 pages (133120 bytes).

CAUTION

There are no error recovery procedures if you attempt to install a sysout on a volume that is too small. Any data that existed on that volume before the fetch is destroyed and the sysout you were fetching is unusable.

Troubleshooting—MP Code 982

If, when trying any of these operations, you see an MP code of 982 the TCP host address for your

machine has not been properly initialized. Should this occur, reboot the SystemTools volume and follow the instructions found in the section "Setting TCP Parameters Using the Profile Tool."

APPENDIX A

Lyric Library Module Floppy Directory

The following table lists Library Module *LCOM* files in the left column and floppy numbers in the right column.

Table 7. Library Modules by Floppy Number

LIBRARY MODULE	FLOPPY #
4045XLPSTREAM.LCOM	Lyric Library #3
BROWSER.LCOM	Lyric Library #2
CENTRONICS.LCOM	Lyric Library #3
CHARCODETABLES.LCOM	Lyric Library #3
CHAT.LCOM	Lyric Library #2
CHATTERMINAL.LCOM	Lyric Library #2
CMLARRAY-SUPPORT.LCOM	Lyric Library #3
CMLFLOATARRAY.LCOM	Lyric Library #1
COPYFILES.LCOM	Lyric Library #1
DANDELIONKEYBOARDS.	Lyric Library #3
DATABASEFNS.LCOM	Lyric Library #2
DAYBREAKKEYBOARDS.	Lyric Library #3
DEDIT.LCOM	Lyric Library #2
DEDITPP.LCOM	Lyric Library #2
DES.LCOM	Lyric Library #2
DLRS232C.LCOM	Lyric Library #2
DLTTY.LCOM	Lyric Library #2
DMCHAT.LCOM	Lyric Library #2
DOVEKEYBOARDS.	Lyric Library #3
DOVERS232C.	Lyric Library #2
EDITBITMAP.LCOM	Lyric Library #1
EDITBITMAP.LCOM	Lyric Library #2

READSYS.LCOM .... Lyric Library #1
REMOTEVMEM.LCOM .... Lyric Library #1
RS232CHAT.LCOM .... Lyric Library #2
RS232CMENU.LCOM .... Lyric Library #2
SAMEDIR.LCOM .... Lyric Library #1
SCALEBITMAP.LCOM .... Lyric Library #1
SKETCH.LCOM .... Lyric Library #1
SKETCHBMELT.LCOM .... Lyric Library #1
SKETCHEDIT.LCOM .... Lyric Library #1
SKETCHELEMENTS.LCOM .... Lyric Library #1
SKETCHOBJ.LCOM .... Lyric Library #1
SKETCHOPS.LCOM .... Lyric Library #1
SKETCHSTREAM.LCOM .... Lyric Library #1
SPY.LCOM .... Lyric Library #2
SYSEDIT. .... Lyric Library #3
TABLEBROWSER.LCOM .... Lyric Library #2
TABLEBROWSERDECL.LCOM .... Lyric Library #2
TCP.LCOM .... Lyric Library #2
TCPCHAT.LCOM .... Lyric Library #2
TCPCONFIG.LCOM .... Lyric Library #2
TCPDEBUG.LCOM .... Lyric Library #2
TCPDOMAIN.LCOM .... Lyric Library #2
TCPFTP.LCOM .... Lyric Library #2
TCPFTPSRV.LCOM .... Lyric Library #2
TCPHTE.LCOM .... Lyric Library #2
TCPLLAR.LCOM .... Lyric Library #2
TCPLLICMP.LCOM .... Lyric Library #2
TCPLLIP.LCOM .... Lyric Library #2
TCPNAMES.LCOM .... Lyric Library #2
TCPTFTP.LCOM .... Lyric Library #2
TCPUDP.LCOM .... Lyric Library #2
TEDIT.LCOM .... Lyric Library #1
TEDITABBREV.LCOM .... Lyric Library #1
TEDITCHAT.LCOM .... Lyric Library #2
TEDITCOMMAND.LCOM .... Lyric Library #1
TEDITDECLS.LCOM .... Lyric Library #1
TEDITFILE.LCOM .... Lyric Library #1
TEDITFIND.LCOM .... Lyric Library #1
TEDITFNKEYS.LCOM .... Lyric Library #1
TEDITHCPY.LCOM .... Lyric Library #1
TEDITHISTORY.LCOM .... Lyric Library #1

TEDITLOOKS.LCOM .... Lyric Library #1
TEDITMENU.LCOM .... Lyric Library #1
TEDITPAGE.LCOM .... Lyric Library #1
TEDITSCREEN.LCOM .... Lyric Library #1
TEDITSELECTION.LCOM .... Lyric Library #1
TEDITWINDOW.LCOM .... Lyric Library #1
TELERAID.LCOM .... Lyric Library #1
TEXEC.LCOM .... Lyric Library #2
TEXTOFD.LCOM .... Lyric Library #1
TFBRAVO.LCOM .... Lyric Library #1
TTYCHAT.LCOM .... Lyric Library #2
VIRTUALKEYBOARDS.LCOM .... Lyric Library #2
VMEM.LCOM .... Lyric Library #1
VT100KP.LCOM .... Lyric Library #2
VTCHAT.LCOM .... Lyric Library #2
WHEREIS.LCOM .... Lyric Library #2

Lyric Font Organization

The following tables group fonts according to the application to which are most suited. The category name is followed by a short description, then by a list of the type families in that category.

Table 8. Presentation Fonts

Presentation Fonts	Display & User Interface Applications
Helvetica	sans serif
TimesRoman	serif
Gacha	monospace screen font, only in MRR 8,10,12

Table 9. Publishing Fonts

Publishing Fonts	Foreign, Technical Alphabets, Characters
Classic	serif in all character sets, sizes, faces
Modern	san serif, nearly as complete (fewer sizes)
Terminal	monospaced, fairly complete except in sizes

Table 10. Printwheel Fonts

Printwheel Fonts	Word Processing Applications
BoldPS	proportional serif
LetterGothic	monospaced san serif
Titan	monospaced serif

Table 11. Japanese Kanji Fonts

Japanese Kanji 1 Fonts	Kanji Characters in JIS I
Classic	in 8 through 24 point
Japanese Kanji 2 Fonts	Kanji Characters in JIS II & Others
Classic	in 8 through 24 point

Table 12. Chinese Character Fonts

Chinese Character fonts	Chinese Characters
Classic	in 12 & 24 point
Modern	in 12 point

Table 13. Miscellaneous Fonts

Miscellaneous Fonts	Rare & Nonstandard Applications
ClassicThin	brackets & parens in 16, 20, 26, 30
Hippo	Greek or Latin
Logo	for displaying Xerox logo only
Math	math symbols
OldEnglish	very ornate 10 & 18 point
PCTerminal	IBM PC glyphs
Snail	math symbols
Symbol	
Tonto	thick monospaced, 14 point MRR

1108 Floppy Organization

The following tables show where 1108 Display fonts and Printer Metric fonts are located on floppy disks.

Table 14. 1108 Display Fonts

Floppy	Font Type	Qty.	Description
1	Publishing	1/2	Classic & Modern
2	Publishing	2/2	Modern (cont.)
3	Japanese Kanji 1	1/3	08 - 18 pt. Classic csets 060 - 117
4	Japanese Kanji 2	2/3	08 - 18 pt. Classic csets 120 - 177
5	Japanese Kanji 1&2	3/3	24 - 24 pt. Kanji 1 & 2
6	Chinese & Misc	1/1	Classic & Modern Chinese & Misc
7	Presentation/ Printwheel	1/1	Presentation, Printwheel, & Terminal;All BoldPS, LetterGothic, Titan

Table 15. 1108 Printer Metric Fonts

Floppy	Font Type	Qty.	Description
1	Lyric Font Metrics	1/1	alphabetic, BoldPS to ClassicThin
2	Lyric Font Metrics	1/2	alphabetic, Helvetica to Titan

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GLOSSARY

ALAG
An acronym for Automatic Load and Go, this term describes diagnostic programs that run with little or no user interaction. Typically, these diagnostics have no menus or commands. Once started, they run independently, and upon completion they return a simple PASS/FAIL indication. If a failure is indicated, other diagnostics are then run by a service technician. Boot Diagnostics and Preboot diagnostics are ALAG.

ARPANET
Network linking research computers. An acronym for Advanced Research Projects Agency Network.

B RESET
Meaning "boot reset", the left button on the front of your processor unit.

base state
Black screen with bouncing white rectangle.

bit map
A representation of a graphic entity as a sequence of bits.

boot
Short for bootstrap, a machine-level software routine that facilitates system start-up. Also describes the process of loading a boot file onto a computer.

break
An indication of an error. When an error occurs, Lisp enters a "break" and displays a "break window". The break window looks very much like an Exec window.

break window	A working space for handling errors. The title is usually the name of the broken function.
CAR	The first element in a list. Derived from "Contents of the Address part of Register".
caret	The blinking symbol on your screen indicating where input is to go. You change the position of the caret by moving the **mouse cursor** and pressing the left mouse button
CDR	The remainder of a list once the CAR is removed. Derived from "Contents of the Decrement part of Register"
clearinghouse	A Xerox Network service that provides a directory function within an internal network. This lets all other system components locate requested resources and other registered objects. It is implemented as a distributed system.
core device	An emulation, in Lisp virtual memory, of an external device, such as the local rigid disk. If you do not set up a directory on your LispFiles disk partition, the 1186 emulates your rigid disk {DSK} with a core device {PSEUDO-DSK}.
	The term core device dates back to the days when computer memory was stored electromagnetically in a wire grid. This physical core has since been replaced by semiconductors, and the function of core memory has been taken over by RAM (Random Access Memory).
CRT	Abbreviation for Cathode Ray Tube Your 1108 display screen is an example

of a cathode-ray tube. An electron beam focused on a small cross-section of a luminescent screen produces a visible pattern. The beam can be varied in intensity and location to display any form.

cursor

A character, usually a diagonal arrow on the 1108 CRT, that follows the movement of the mouse and lets you reposition the caret. It is sometimes called the mouse cursor. The cursor can change shape under certain conditions. An hour glass shape indicates that a process is going on. A small box, or icon, representing the mouse requires a confirmation response before a selected process is performed.

DCE

Abbreviation for Data Communications Equipment. An interface suitable for connection to local printers.

diagnostics

Tests used to troubleshoot and isolate problems. Normal or casual users need diagnostics to give positive indications of hardware failures.

default

An action taken (or value specified) if no other action is specified by the user.

directory

A set of one or more files stored together in the same place on a device.

DTE

Abbreviation for Data Terminal Equipment. An interface suitable for common carrier communications.

Ethernet

Communication line used to connect multiple systems having compatible interfaces.

Exec	The executive window that contains the cursor at initialization. As of the Lyric release, there are Exec windows for Common Lisp, Xerox Common Lisp, Interlisp, and Old Interlisp. Unless otherwise noted, all functions and calls in this user's guide should be typed into an Interlisp Exec.
extended processor board	A special processor board that has extra microcode storage and a floating-point accelerator. If your workstation is equipped with this board, the Maintenance Panel will display 1109 instead of 1108 under normal conditions.
extension	Appended to a file name, the extension, such as ".tedit" in the name of this file, GLOSSARY.TEDIT;4, usually indicates what type of file it is. The ";4" is the version number, which shows how many times the file has been modified. The extension is separated from the file name with a period; the version number is separated from the extension by a semicolon.
file server	Computer that provides file storage and retrieval service for users of the network.
function	A Lisp procedure that carries out a series of steps to produce some result. A function has a name and zero or more arguments on which it does its work.
host	Any machine on a network. Often used to refer specifically to a machine that provides a network service, such as filing.

icon	An on-screen pictorial representation, usually of a shrunken window.
Init file	Abbreviated form of initialization file, a file containing user-specified programs. An Init file lets you personalize your Lisp environment by automatically including those programs that are most useful to you every time you log in.
Installer menu	The menu referred provided on the *Installation Utility* floppy disk. It contains 17 options, to which you respond by typing the number of the chosen item.
installer prompt	The right angle bracket (>) displayed in the Installer menu that usually indicates a user response is required.
Interlisp-D	A dialect of Lisp.
IOP	Input/Output Processor.
Lisp	Interactive, recursive programming language widely used for artificial intelligence applications. Short for "List Processing."
logical volume	One of the sectors into which a storage medium, such as the local rigid disk, is divided. Typical logical volumes for the 1108 include SystemTools, Lisp, Lisp2, and LispFiles.
MP Codes	The four LED indicators on the front, or maintenance panel, of the processor unit indicate progress and failures and help trace problems. MP codes appear during booting to indicate the progress of the boot operation; when running some diagnostics; and when hardware or software failures occur. During normal

operation, the MP code displayed is the same as the model of machine, that is, 1108. On some Xerox machines, these codes are displayed in a small square on the screen (the cursor temporarily changes to display the codes), and are therefore called cursor codes.

Media Scan One of the diagnostic tests run by Rigid Disk Diagnostics. Media Scan examines the storage media page by page, looks for CRC (Cyclic Redundancy Check) errors, and reports them accordingly.

menu A collection of text strings, buttons, or icons generally used to present a set of possible actions for user selection.

Mesa An extended Pascal-like, high-level programming language developed at Xerox.

Mesa Processor Any machine capable of supporting the Mesa Language.

microcode The microinstructions that tell a computer, especially a microprocessor, what to do.

module A Xerox Lisp tool, or program, designed to help you carry out some complex procedure or task. A module must be loaded into your environment before you can use it.

mouse Pointing device equipped with buttons. Your 1108 workstation may have a two-button or three-button mouse. Sometimes referred to as the optical pointer.

mouse cursor See description for **cursor**.

MPB Mesa Processor Board.

network	An interconnection of several computers and/or other devices, such as printers, that lets them communicate and share resources. Sometimes also used to refer to the medium itself, such as a coaxial cable in the case of the Ethernet.
NIL	In Lisp, NIL means "false".
NS	Abbreviation for network systems
operating system	A collection of software routines used to supervise the sequencing and processing of computer programs.
PARC	Abbreviation for the Xerox Palo Alto Research Center.
partition	Same as logical volume.
path name	The complete name of a file you want to load. Includes the name of the file server, the directory and subdirectories. For example, a Lisp sysout's path name might be {eris}<lisp>lyric>basics>full.sysout, where eris is the name of a file server, lisp is the directory, lyric and basics are the subdirectories, and full.sysout is the specific name of the software you want to load.
physical volume	The highest level of logical structuring of the media (usually the rigid disk.)
Pilot Operating System	The operating system for the Mesa processor, which serves as an interface between the processor and all other software.
prompt window	The black window at the top of your screen used to display Executive process information. This window can be moved, shaped and temporarily closed.

protocols	Standards specifying how machines exchange information over a network.
PUP	Abbreviation for PARC (see PARC, above) Universal Packet, one of the structures used to transmit blocks of information (packets) on the Ethernet. Also, one such unit of information.
scavenger	Software facility capable of making repairs in page, file order, structure, and in some cases, content.
sysout	A frozen version of a Xerox Lisp environment. It contains all the information needed to initialize virtual memory when Xerox Lisp is started.
Tajo	A Mesa-based window environment that supports System Tools.
Teleraid	A debugging program available as a library module.
TOD clock	Time of Day clock.
tracking symbol	Small graphics figure on a display device that represents the position of the cursor and tracks the movement of the mouse. See the description for cursor.
virtual memory	Working space on the local disk that can be used, with the aid of swapping programs, to emulate core memory.
VAX	One of Digital Equipment Corporation's super-minicomputers, such as a VAX 11/750 or 11/780.
VMS	Abbreviation for VAX Monitoring System, one of the operating systems used by Digital Equipment Corporation's VAX computers.

window   A defined area within a display screen
                          that can be used as a working space.
                          Multiple windows can be active
                          simultaneously on one display screen,
                          and can overlay one another.

XSIS   Abbreviation for Xerox System
                          Integration Standard. These Xerox
                          character code standards are also
                          referred to as NS characters.

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Xerox Artificial Intelligence Systems

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