

# ALTO SUBSYSTEMS CATALOG

June 1979

Filed on [Maxc]<AltoDocs>SubsystemsCatalog.Press.

This catalog lists and briefly describes the various Alto subsystems. A subsystem is defined to be any program that runs on the Alto whether under control of the standard executive or as a stand-alone. Each subsystem has an entry in this form:

**ProgramName:** Description  
DOCUMENTATION: FilePath

Italicized *ProgramNames* indicate entries that are new or significantly altered. To simplify locating a piece of software to perform a specific function, a functional cross reference of Alto subsystems is provided beginning on page 8. New subsystems are continually being developed throughout the Whole Alto World. This catalog is maintained and distributed by the Whole Alto World Coordinator (Ron Cude). If you have or know of a subsystem which you feel should be included, please provide the above information to the Coordinator. The following criteria should be met before a subsystem is cataloged and distributed:

1. The program should be in general use at the installation.
2. Support should be provided to at least fix major bugs.
3. Satisfactory documentation must be available and up to date.
4. Management must indicate the sensitivity of the item to outside disclosure.

The subsystems listed are generally available from your local File Server or Maxc under the <Alto> directory; the supporting documentation is found in the <AltoDocs> directory unless otherwise noted. If you do not have access to a File Server or Maxc, contact the Coordinator.

**AIS:** A driver subsystem which interacts with the user to perform a set of standard operations on imaginal data stored as AIS (Array of Intensity Samples) files.  
DOCUMENTATION: AIS-Manual.press.

**AISdump:** A part of the AIS system to write out to the Diablo disk the decimal values for pixels within a specified window.  
DOCUMENTATION: None.

**AISmagnify:** A part of the AIS system to magnify or minify AIS format images in either 1 or 8 bit/pixel form.  
DOCUMENTATION: [Erie]<AIS>Memos>AISmagnify.press.

**AISshow:** A part of the AIS system that displays an AIS image file on the Alto display.  
DOCUMENTATION: [Erie]<AIS>Memos>AISshow.press.

**ANALYZE:** A part of the Design Automation System that transforms logic diagrams produced using SIL into a file which can be input to the GOBBLE wirelister.  
DOCUMENTATION: [Maxc]<SIL>SilManual.press.

**APROM:** Superseded by PROM.

**ASM:** An assembler for the Alto machine language which produces relocatable files compatible with the BCPL loader, BLDR.  
DOCUMENTATION: ASM.tty or Subsystems.press.

**BCA:** A basic cross-assembler for micro-computers.  
DOCUMENTATION: BCA.press.

**BCPL:** A compiler for Alto BCPL language which produces files relocatable with the BLDR loader.  
DOCUMENTATION: BCPL.tty/.press.

**BLDR:** A loader for the relocatable files produced by BCPL and ASM.  
DOCUMENTATION: BCPL.tty/.press.

**BRAVO:** A text editor having extensive formatting and hardcopy facilities.  
DOCUMENTATION: ALTO User's Handbook, BRAVO Course Outline, BRAVO.press and BRAVOSUMMARY.press.

**BTREETEST:** A B-Tree dictionary maintenance program used to support the PROOFREADER data base.  
DOCUMENTATION: ProofReader.tty.

**BUILD:** a part of the Design Automation System that helps with the data management aspects of building boards and keeping the design automation data files current.  
DOCUMENTATION: [Maxc]<SIL>SilManual.press.

**BUILDBOOT:** a program for constructing type B bootfiles from either an executable (BLDR out) file or a segment file.  
DOCUMENTATION: BUILDBOOT.tty or Subsystems.press.

**CALCULATOR:** a bootfile that pictures a TI SR-52 on the display which is operated by using the mouse to select the appropriate keys. It is not programmable.  
DOCUMENTATION: SR-52 Manual.

**CALLFTP:** a subset of FTP which always lives in the operating system. CALLFTP is much smaller than FTP and can be used when space is tight.  
DOCUMENTATION: FTP manual.

**CHAT:** a program for establishing PUP Telnet connections between a pair of cooperating parties. Its chief function is to permit Alto users to talk to Maxc.  
DOCUMENTATION: ALTO User's Handbook, CHAT.tty or Subsystems.press.

**CLEANDIR:** a program to garbage collect a disk file directory (but not disk space).  
DOCUMENTATION: Subsystems.press.

**CONDENSE:** a program to retrieve the screen bitmap from the SWAT and SWATEE files for display or output to an AIS or Press format disk file.  
DOCUMENTATION: Menu is self-explanatory.

**COPYDISK:** a program for copying entire diskpacks. It will copy from one drive to another on the same machine, or between drives on separate machines via a network using Diablo Model 31/44 and Trident T-80/T-300 disks.  
DOCUMENTATION: COPYDISK.tty or Subsystems.press.

**COPYFROMDRIVE1:** a program to copy an individual file from DP1 to DP0 of a dual disk Alto.  
DOCUMENTATION: Subsystems.press.

**CREATEFILE:** a program to create a file of a given size, attempting to allocate it on consecutive disk pages.  
DOCUMENTATION: Subsystems.press.

**CRTEST:** a diagnostic program used to adjust the Alto display linearity. Three different sized grids are displayed in rotation (press any key to change grids).

DOCUMENTATION: none.

**CRUMPLE:** a program to compress and, optionally, encrypt data files. The resulting files can be stored or transmitted but must be expanded and decrypted before processing by Alto programs.

DOCUMENTATION: Crumple.press.

**DDS:** a program to manage an Alto diskpack. Facilities are provided to display filenames, lengths, creation-read-write dates, and contents, internal operations such as delete, and rename, and external operations such as Send and Execute.

DOCUMENTATION: ALTO User's Handbook or DDS.tty or Subsystems.press.

**DMT.BOOT:** a memory diagnostic and statistics gathering program.

DOCUMENTATION: DMT.tty or Subsystems.press.

**DO:** a wonderful program giving a parameterized interface to the executive. More powerful than CM files, and useful with the IF program.

DOCUMENTATION: DO.press.

**DPRINT:** a program to type text files on the Diablo HyType printer.

DOCUMENTATION: DPRINT.tty or Subsystems.press.

**DRAW:** an interactive illustrator program for creating black-and-white or color pictures composed of lines, curves, and text captions. The illustrations can be output to a one page press file.

DOCUMENTATION: ALTO User's Handbook plus DRAWnews.press, an on-line manual (part of the DRAW package), and DRAW-Summary.press.

**EDP:** an Ethernet interface diagnostic.

DOCUMENTATION: None.

**EFTP:** a small but inefficient Ethernet FTP protocol.

DOCUMENTATION: EFTPPackage.tty.

**EMPRESS:** a program to send press and text, e.g. bravo format, files to a press printing server. Simple formatting options such as Tab and FormFeed are available.

DOCUMENTATION: EmPress.tty or Subsystems.press.

**ERP:** a program that listens for event packets on the Ether. Useful for monitoring and gathering statistics.

DOCUMENTATION: ERP.press.

**EXECUTIVE:** the Alto command processing subsystem, the intermediary by which users generally invoke other subsystems and perform several operations on the Alto file system. Normally invoked by the boot operation.

DOCUMENTATION: Executive.tty or Subsystems.press.

**FIND:** a subsystem to search one or more text files for a user supplied string at very high speed and then display each line containing an occurrence of the pattern on request.

DOCUMENTATION: FIND.tty or Subsystems.press.

**FRED:** a part of the Font Creation System, it is used to create and/or edit "splines" (i.e. outlines) of characters.

DOCUMENTATION: [Maxc]<GR-DOCS>Fred.ears.

**FTP:** a file transfer program to store and retrieve files between an Alto and another Alto, Maxc, or File Server. It also supports a Telnet connection that is similar to CHAT in purpose and operation.  
DOCUMENTATION: FTP.tty or Subsystems.press.

**GOBBLE:** a part of the Design Automation System that generates a wirelist and routing information for a single board given one or more node list files generated by ANALYZE.  
DOCUMENTATION: [Maxc]<SIL>SilManual.press.

**GYPSY:** a modeless text editor using both keyset and mouse, and having a "filing cabinet" interface which provides some file management facilities beyond the normal Alto filing system. Used in applications where limited formatting facilities are required such as programming.  
DOCUMENTATION: Under development.

**HARDCOPY:** a wonderful program that retrieves and prints files from anywhere, your Alto, Maxc, a File Server, etc.  
DOCUMENTATION: HardCopy.tty.

**ICARUS2:** a part of the ICARUS2 System, it is an interactive program for actually laying out printed circuits and manipulating the resulting files.  
DOCUMENTATION: [Maxc]<ICARUS>Icarus2doc.press, ICtools.press.

**IF:** a program allowing conditional execution of executive commands. Useful in conjunction with DO files and CM files.  
DOCUMENTATION: IF.press.

**IFD2:** a part of the ICARUS2 System that turns an ICARUS2 file into human readable form, describing each symbol and its contents.  
DOCUMENTATION: [Maxc]<ICARUS>IFD2doc.press.

**IFS:** the Ivy File System server that provides one end of the file transfer facility and maintains the files and directories on Trident T-80/T-300 disks.  
DOCUMENTATION: [Maxc]<IFS>IFSdocuments.press.

**IFSSCAVENGER:** a subsystem to check and correct Trident T-80/T-300 diskpacks from the Ivy and Trident File Systems.  
DOCUMENTATION: [Maxc]<IFS>ScavOp.press.

**INSTALLSWAT:** an installation program to install the SWAT debugging system on your disk.  
DOCUMENTATION: None.

**KAL:** a kalidescope program that you Etherboot.  
DOCUMENTATION: None.

**KEYTEST:** a diagnostic program that displays the Alto keyboard, keyset and mouse. The depressing of any key(s) is reflected by inverting (white to black) the display of that key on the screen. If the keyboard displayed doesn't match the one you are using, move the cursor to the bottom of the display and hit any mouse button.  
DOCUMENTATION: none.

**LAUREL:** a Maxc MSG compatible, display-based, message system that runs on your Alto.  
DOCUMENTATION: [Maxc]<Laurel>Laurel.press and a system tutorial retrieved with Laurel software.

**LISTSYMS:** a programming aid to convert a .Syms file (produced by BLDR) to a useful, human readable form.  
DOCUMENTATION: ListSyms.tty or Subsystems.press.

**LOGICPROM:** Superseded by PROM.

**MADTEST:** a bootfile diagnostic that runs tests on an Alto's RAM, ALU, and emulator.  
DOCUMENTATION: Alto User's Primer.

**MAILCHECK:** a simple subsystem that checks for mail at some other host (e.g. Maxc) via the Ethernet.  
DOCUMENTATION: MailCheck.tty or Subsystems.press.

**MARKUP:** an illustrator used to add pictures consisting of lines, areas, mouse tracks and text captions to formatted documents, i.e. Press files. It may also be used to simply display press files.  
DOCUMENTATION: Alto User's Handbook.

**MENUEEDIT:** a program that edits menus for the BCPL menu package.  
DOCUMENTATION: Menu.press.

**MIKE:** a part of the ICARUS2 System that transforms ICARUS2 files into a form suitable for the Mann 3000 pattern generator.  
DOCUMENTATION: [Maxc]<ICARUS>MikeUserDoc.press, MikeDoc.press.

**MOVETOKEYS:** Obsolete, non-functional.

**MU:** the Alto Microcode assembler.  
DOCUMENTATION: MU.tty or Subsystems.press.

**NEPTUNE:** a small, fast DDS-like program for manipulating your Alto directory.  
DOCUMENTATION: Neptune.press.

**NETWORK EXECUTIVE:** the executive obtained by booting from the Gateway over the Ethernet that provides a convenient way to call "bootfiles" such as FTP or COPYDISK.  
DOCUMENTATION: NetExec.tty.

**NPGR:** Obsolete part of the Sil system.

**NPPR:** Obsolete part of the Sil system.

**OEDIT:** a subsystem for displaying and modifying Alto files in octal. Up to four files may be simultaneously viewed while one of them may be modified.  
DOCUMENTATION: Oedit.tty or Subsystems.press.

**ORBITTEST:** the ORBIT interface diagnostic.  
DOCUMENTATION: [Ivy]<Spruce>ORBITtest.press.

**PACKMU:** a program to convert the output of MU (an MB file) to a "packed RAM image" which is easy to load into the RAM using RPRAM.  
DOCUMENTATION: PackMU.tty or Subsystems.press.

**PEEK:** a program which listens to the Ethernet for PeekReports and EventReports. It can also serve as a bootserver and Ethernet Echo server for use with EDP.  
DOCUMENTATION: DMT.tty.

**PEEKPUP:** a small subsystem enabling one to peek at Pups going to and from a particular Ethernet host; a debugging aid for new Pup software.  
DOCUMENTATION: PeekPup.tty or Subsystems.press.

**PEEKSUM:** a subsystem that summarizes the error reports sent to PEEK by DMT.  
DOCUMENTATION: DMT.tty.

**PREPRESS:** a part of the Font Creation System that takes "spline character definitions", usually created by FRED, and generates scan-converted characters, spline and character dictionaries, readable listings describing the dictionary's content, and a "widths" file for use by text formatting programs.  
DOCUMENTATION: [Maxc]<GR-DOCS>PrePress.press.

**PRESS:** a subsystem to print full press files on press printers.  
DOCUMENTATION: [Maxc]<GR-DOCS>PressOps.press.

**PRESSEEDIT:** a program to combine Press files together, convert Ears files (generated by Pub and Bravo) to Press format, selecting certain pages from a Press or Ears file, or to add extra fonts. The output is a Press file.  
DOCUMENTATION: PressEdit.tty or Subsystems.press.

**PROM:** a subsystem to edit microcode, drive the Alto PROM blower and verify PROMs.  
DOCUMENTATION: PROM.bravo.

**PROMDIAG:** Superseded by PROM.

**PROOFREADER:** an interim English text proofreader that produces an output file listing the questionably-spelled words.  
DOCUMENTATION: ProofReader.tty.

**PUPTEST:** a PUP protocol and network integrity test program.  
DOCUMENTATION: None.

**PUT:** a program for transferring files between the disks of a dual-drive Alto. Its function is also performed by the more comprehensive NEPTUNE.  
DOCUMENTATION: Internal to the program.

**QED:** an in-core line editor used primarily for programming. The file is limited to about 1500 lines of BCPL.  
DOCUMENTATION: QED.tty or Subsystems.press.

**RAMLOAD:** a microcode loader that uses the output of the microcode assembler, MU.  
DOCUMENTATION: RamLoad.tty or Subsystems.press.

**RAMTIMING:** a bootfile diagnostic program to test the Alto RAM. Its function is also performed by the more comprehensive MADTEST.  
DOCUMENTATION: None.

**READPRESS:** reads Press files and displays a text-listing of the entity commands, DL strings, etc.  
DOCUMENTATION: Subsystems.press.

**RENAME:** Obsolete replacement for the Executive's Rename command.

**RPRAM:** a microcode loader that loads a packed RAM image (generated by PACKMU) into the RAM after checking the constant memory.  
DOCUMENTATION: PackMU.tty or Subsystems.tty.

**SCAVENGER:** a subsystem for checking and correcting Alto disk packs.  
DOCUMENTATION: Scavenger.tty or Subsystems.press.

**SETTIME:** Obsolete.

**ShowAIS:** a bootfile that halftones and displays 8 bit/pixel AIS files stored on a remote file server. (Use of this program significantly loads the file server, limiting overall performance. Do not use it frivolously.)

DOCUMENTATION: [Ivy]<Maleson>ShowAIS.bravo.

**SIGMA:** a subsystem to transfer arbitrary files between an Alto and a SIGMA 3 over the Ethernet.

DOCUMENTATION: "Ethernet Software for Data Transfer between the SIGMA 3 and an ALTO", a Xerox Internal Report, Accession No. X7704459.

**SIL:** a part of the Design Automation System, it is an illustrator for the creation of logic and line diagrams. The output can generate Press files or be processed by ANALYZE for circuit design.

DOCUMENTATION: [Maxc]<SIL>SilManual.press.

**SORT:** a very small subsystem which will sort files containing less than 1000 entries delimited by a carriage return.

DOCUMENTATION: Subsystems.press.

**SPRUCE:** a printer server that utilizes the ORBIT buffer to drive Press printers, e.g. Dover and Sequoia.

DOCUMENTATION: [Maxc]<Spruce>SpruceManual.press.

**SWAT:** a emulator-level code debugger with BCPL oriented features used with the Alto operating system.

DOCUMENTATION: Swat.tty or Subsystems.press.

**SYS.BOOT:** the operating system boot file on the Alto disk.

DOCUMENTATION: None.

**TFU:** a file utility used to initialize a Trident pack with a virgin file system and to perform various file copying, deleting, directory listing operations. This is not a part of the Ivy System, rather it initializes and maintains packs operated on by the TFS package.

DOCUMENTATION: TFS.tty or Subsystems.press.

**TRANSFILE:** a part of the ICARUS2 System that translates the intermediate files generated by Mike into human-readable form. The files it produces are fully instantiated.

DOCUMENTATION: [Maxc]<ICARUS>TransfileDoc.press.

**TRIEX:** a Trident diagnostic used to debug and exercise Trident disk drives.

DOCUMENTATION: Self-contained.

**TYPE:** a functional replacement to the Executive supplied "type.~" that displays a larger page, suppresses Bravo trailer information, can skip forward and backward, etc.

DOCUMENTATION: TYPE.tty.

**UGH:** an in-core text editor utilizing both mouse and keyset. While some formatting facilities are available, it is used primarily for programming.

DOCUMENTATION: UGH.tty.

**VIEWDATA:** a subsystem to display on the Alto screen three-dimensional data stored as a two-dimensional array of single-word values.

DOCUMENTATION: ViewData.tty.

**VIEWIC:** a part of the ICARUS2 System that displays the data created by Mike on the Alto screen, simulating the actions of the pattern generator.

DOCUMENTATION: [Maxc]<ICARUS>ViewicDoc.press.

**VPRINT:** a subsystem to output text files such as .TTY, UGH, BRAVO, or GYPSY, to a Versatec printer.

DOCUMENTATION: Under development.

# FUNCTIONAL CROSS REFERENCE

The following list of Alto subsystems is organized according to the general function they perform. Because many subsystems perform more than one function or a function may be thought of in a variety of ways, an item may be listed more than once.

The major functional headings are:

Document Creation	Hardware Design	Messages
Files	Hardware Diagnostics	Printing
Font Creation	Hardware Drivers	Programming
	Recovering	

## DOCUMENT CREATION

### EDITORS

#### TEXT

BRAVO: Rich in formatting features.  
 GYPSY: Features to handle groups of files (e.g. chapters or modules).  
 PROOFREADER: Produces an output file of questionably spelled words.  
 QED: A line editor.  
 UGH: An in-core editor that uses the keyset for command input.

#### GRAPHIC

DRAW: Pictures composed of lines, curves, text and smoothed mouse tracks.  
 FRED: A Spline editor for font work.  
 MARKUP: Dot pictures of lines, areas, text, and mouse tracks.  
 SIL: For creating diagrams composed of lines with text captions.

#### IMAGES

AIS: Image manipulation, printing, Press file creation.

#### PAGE MAKEUP

MARKUP: Create new or move pre-existing diagrams along side existing text.

#### MERGING

AIS: Merges bitmap files (e.g PRESS output and AIS files).  
 EMPRESS: Append press files to personalized coversheets.  
 PRESSEEDIT: Generate Press files from pages of other Press files.

PRINTING: see PRINTING below.

## FILES

### DISPLAY

AISshow: AIS files.  
 OEDIT: Alto files in octal.  
 MARKUP: Press files.

PRESS: Press files.  
 READPRESS: Press file internals.  
 ShowAIS: 8 bit/pixel AIS files from remote file servers.  
 TYPE: Text files.  
 VIEWDATA: Three-dimensional information stored as a matrix of values.

## **TRANSFER**

COPYDISK: Copies whole disks, Diablo Models 31/44 and Trident T-80/T-300.  
 FTP: Copies a file between Altos, Alto-File Server, and Alto-Maxc.  
 GYPSY: Transmits its files to a Communicating 800 ETS.  
 NEPTUNE: Copies files between disks of a dual drive Alto.  
 PUT: Copies files between disks of a dual drive Alto.  
 SIGMA: Copies files between Alto and SIGMA 3.  
 TFU: Copies files between Trident drives.

## **ALTO FILE SYSTEM**

CALLFTP: Very small version of FTP.  
 CLEANDIR: Garbage collect disk directory.  
 CREATEFILE: Adds new file of specified size on consecutive pages, if possible.  
 CRUMPLE: Compresses and optionally encrypts a file.  
 DDS: Large directory manipulation subsystem.  
 EXECUTIVE: Delete files, list directory.  
 FIND: Locates and displays lines containing a specified text string.  
 FTP: Transfers files between Alto and Alto, a File Server, or Maxc.  
 NEPTUNE: Small directory manipulation subsystem. Deletes, renames, and copies files between disks of a dual drive Alto.  
 OEDIT: Display and modify file in octal.  
 PUT: Deletes, renames, and copies files between disks of a dual drive Alto.  
 SCAVENGER: Checks and corrects the disk.  
 SIGMA: Transfers files between an Alto and SIGMA 3.  
 SORT: Sorts up to 1000 items delimited by carriage returns.  
 TYPE: Displays contents of text files.

## **FILE SERVER SYSTEM**

IFS: The server.  
 IFSSCAVENGER: Checks and corrects Trident T-80/T-300 disks.  
 TFU: Initialize directory and verify disk.

## **TRIDENT FILE SYSTEM**

IFSSCAVENGER: Checks and corrects Trident T-80/T-300 disks.  
 TFU: Initialize and list directory, verify disk, copy and delete files.

## **RECOVERY**

IFSSCAVENGER: Check and correct disks of File Server and Trident file systems.  
 SCAVENGER: Check and correct disk of Alto file system.

## **FONT CREATION**

### **SPLINES**

DRAW: Create splines using mouse or knots.

FRED: Create and edit splines, create font files.

### **BITMAPS**

PREPRESS: Scales and rotates splines, converts to and edits bitmaps.

### **DEVICE FORMATS**

PREPRESS: Creates printer and display fonts from bitmaps.

## **HARDWARE DESIGN**

### **CIRCUIT BOARD**

SIL: Create and edit logic diagrams.

ANALYZE: Converts SIL drawing for GOBBLE, generates SIL of unassigned pins.

GOBBLE: Generates wirelist and routing information.

BUILD: Aids data management aspects, keeping data files current.

### **INTEGRATED CIRCUIT**

ICARUS2: Layout integrated circuits.

IFD2: Generates human readable form of ICARUS2 files.

MIKE: Transforms ICARUS2 file to form for Mann 3000 pattern generator.

TRANSFILE: Generates human readable form of MIKE file.

VIEWIC: Displays MIKE output.

ICGERB: Generates Gerber photoplotter output from ICARUS files.

## **HARDWARE DIAGNOSTICS**

### **USER**

CRTTEST: Displays a rectangular grid. (.boot/.run files).

DMT: Memory diagnostic that transmits results to PEEK. (Alto/server boot files).

EDP: Ethernet interface diagnostic.

KEYTEST: Keyboard diagnostic. (.boot/.run files).

MADTEST: Diagnostic for RAM, ALU, and emulator. (.boot/.run files).

TRIEX: A Trident T-80/T-300 diagnostic.

### **INSTALLATION**

DISKTEST: Bootfile diagnostic for the Diablo Model 31.

ORBITTEST: An ORBIT Interface diagnostic.

PEEK Collects PeekReport/EventReport packets on <filename>.

PEEKSUM Summarizes DMT error reports collected by PEEK.

PUPTTEST Ascertains status of network servers.

**HARDWARE DRIVERS** See the Alto Hardware Catalog under appropriate device.

MESSAGES

**SENDING**

CHAT Accesses SNDMSG on Maxc.  
LAUREL Display-based, MSG compatible, running on Alto.

**RECEIVING**

MAILCHECK Interrogates Maxc for new mail.  
CHAT Accesses MSG on Maxc to retrieve mail.  
LAUREL Display-based, MSG compatible, running on Alto.

PRINTING

**REMOTE**

**REFORMATING**

PREPRESS Generates a Press file from .tty and many .press files.

**PRESS**

BRAVO Sends the workfile to Spruce.  
EMPRESS Sends the specified Press and/or Text files to Spruce.  
HARDCOPY Prints any file any place.  
GYPSY Sends the workfile to Spruce.  
SPRUCE A Press server for Dover/Sequoia/Pimlico.

**LOCAL**

BRAVO Prints the workfile on the attached Diablo HyType.  
DPRINT Prints text files on the attached Diablo HyType.  
GYPSY Prints the workfile on the attached Diablo Hytype.  
PRESS Prints Press files on slot and Versatec printers.  
VPRINT Prints text files on Versatec printers.

PROGRAMMING

**EDITORS** See DOCUMENT-EDITORS-TEXT above.

**ASM/BCPL**

ASM Alto machine language assembler.  
BCPL BCPL compiler.  
BLDR Loader for ASM and BCPL relocatable files.  
BUILDBOOT Generates a type B bootfile.  
SWAT an emulator level, BCPL oriented debugger.  
INSTALLSWAT Installs SWAT on a disk.  
LISTSYMS Converts .SYMS files to human readable form.

## MU

MU Microcode assembler.  
RAMLOAD Loads RAM with MU output.  
PACKMU Converts MU output for RPRAM.  
RPRAM Loads RAM with RPRAM output.

## DEBUGGING AIDS

AISdump Writes out pixel values in decimal.  
CONDENSE Recovers display bitmap from SWAT or SWATEE file.  
SWAT An emulator level, BCPL oriented debugger.  
LISTSYMS Converts .SYMS files to human readable form.  
BTREETEST A B-tree dictionary maintenance program.  
PEEKPUP Peeks at PUPs going to and from a specific Ethernet address.  
PUPTTEST Interacts with new subsystems that use the PUP protocol.  
READPRESS Displays entities within a Press file.

## RECOVERING

**DISK FAILURES** See FILES-RECOVERY above.

## SUBSYSTEMS FAILURES

BRAVOBUG Recovers BRAVO files to point of failure.  
CONDENSE Recovers display bitmap from SWAT or SWATEE file.