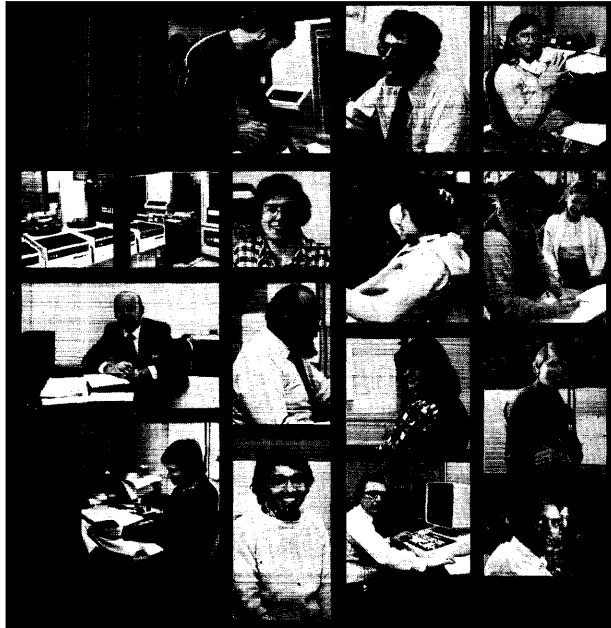


PRIMOS Commands



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PRIME

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The Programmer's Companion

The Programmer's Companion is a new series of pocket-size, quick-reference guides to Prime software products.

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GLOSSARY

Abbreviation of PRIMOS Commands

The minimum required abbreviation of a PRIMOS command is shown in rust colored letters. Only internal commands can be abbreviated.

binary file

A translation of source file generated by a language translator (PMA, COBOL, FTN, RPG). Such files are in the format required as input to the linking loader or segmented loader.

byte

8 bits; 1 ASCII character.

braces { }

Of group of words or parameters enclosed in braces, at least one must appear in command.

communication subsystems

The following PRIMOS commands invoke communications subsystems. Refer to the HASP and RJE2780 guides for further information.

HASP **RJSEND**
RJCNTL **RJRECV**

DBMS subsystems

The following PRIMOS commands invoke data base management subsystems. Refer to the DBMS guides for further information.

CDML **DBMS**
CLUP **FDML**
CSUB **FSUBS**
DBACP

devno

A device number. See **pdisk**

directory

A special type of file containing a list of filenames or other directories, along with information on their characteristics and location. A directory may be the MFD, a UFD or a sub-UFD. Directories with names in the MFD are UFDs; all other directories are sub-UFDs.

directory-chain

Part of a pathname; a series of directories and optional passwords separated by the > symbol, as in:

directory [password] [>subdirectory [password]] . . .

external command

A command that executes in user address space. All external commands cause GO to print when starting. External commands *cannot* be abbreviated.

file

An organized collection of information stored on a disk (or a peripheral storage medium such as tape). Each file has an identifying label called a filename.

filename

The name of a file or directory. Filenames may be up to 32 characters long. The first character *must not* be numeric (0-9). Filenames can be composed only of the following characters: A-Z, 0-9, _ # \$ & - * . / . *Note:* On some devices, underline (_) may print as back arrow (~).

file-unit

A number between 1 and 17 ('21) assigned as a pseudonym to an active file by PRIMOS. This number may be given in place of a filename in certain commands, such as CLOSE. PRIMOS-level internal commands require octal values.

PRIMOS assigned units	Octal	Decimal
INPUT	1	1
LISTING	2	2
BINARY	3	3
COMINPUT	6	6
SEG's loadmap	13	11
COMOUTPUT	21	17

FORMS subsystems

The following PRIMOS commands invoke FORMS subsystems. Refer to the FORMS guide for further information.

FAP **FDL**

identity

The addressing mode plus its associated repertoire of computer instructions. Programs compiled in 64R mode execute in the R-identity; programs compiled in 64V mode execute in the V-identity.

internal command

A command that executes in PRIMOS space. Does not overwrite user memory. Internal commands *can* be abbreviated. See abbreviation of PRIMOS commands.

key, file protection

Specifies file protection

- 0** No access
- 1** Read
- 2** Write
- 3** Read/Write
- 4** Delete and truncate
- 5** Delete, truncate and read
- 6** Delete, truncate and write
- 7** All rights

ldisk

The logical unit number (octal) of a disk volume. It is determined when the disk is brought up by a STARTUP or ADDISK command.

MFD

The Master File Directory. A special directory which contains the names of the UFDs on a particular disk or partition. There is one MFD for each logical disk.

mode

An addressing scheme. The mode used determines the construction of the computer instructions by the compiler.

MIDAS subsystems

The following PRIMOS commands invoke MIDAS subsystems. Refer to the MIDAS guide for dialog instructions.

CREATK **REMAKE**
KBUILD **REPAIR**
KIDDEL

nodename

Name of a system on a network; assigned by CONFIG command when local system is started up.

object file

See **binary file**

output stream

Output from the computer that would usually be printed at a terminal during command execution, but which is written to a file if COMOUTPUT command was given.

packname

See **volume-name**

page

A block of 1024 16-bit words within a segment (512 words on Prime 300)

parentheses ()

A word or parameter enclosed in parentheses must appear along with the enclosing parentheses.

partition

A portion [or all] of a multihead disk pack. Each partition is treated by PRIMOS as a separate physical device. Partitions are an integral number of heads in size, offset an even number of heads from top of the disk pack. A disk partition is also a **volume**.

pathname

A chain of directories starting with the disk volume name and ending with the name of the directory containing the files to be accessed. Its format is:

$$\text{pathname} = \left\{ \begin{array}{l} \langle \text{volume} \rangle \\ \langle \text{ldisk} \rangle \\ \langle * \rangle \end{array} \right\} \text{ directory-chain}$$

$\langle \text{volume} \rangle$ is the name of the disks $\langle \text{ldisk} \rangle$ is a logical disk number (see **ldisk**) and $\langle * \rangle$ represents the current volume. *Note:* the angle brackets are required.

pdisk

A physical disk unit number.

phantom user

A command file running independently of a terminal under control of the PHANTOM command.

PRIMOS

Prime's family of single-user and multi-user disk operating systems.

runfile

The executable version of a program consisting of the binary file, subroutines and library entries used by the program, COMMON areas, initial settings, etc. This file is created using LOAD or SEG.

SEG

Prime's segmentation utility

segment

A 64,536-word block of addressing space.

segno

Segment number

source file

A program file consisting of text, program statements, comments, etc.

square brackets []

A word or parameter enclosed in square brackets is optional.

sub-UFD

A directory which is in a UFD or other sub-UFD.

System operator commands

The following PRIMOS commands are for the system operator. Most of these commands can *only* be issued from the system console. Refer to the System Administrators Guide for further information.

ADDISK	MAKE
AMLC	MAXSCH
CHAP	MAXUSR
CONFIG	OPRPRI
COPY	SETIME
FIXRAT	SHARE
ELIGTS	SHUTDN
LOGPRT	STARTUP
LOOK	USRASR

treename

The complete description of a directory tree, starting with a specified disk volume or partition and ending with a filename. The general format of a treename is:

pathname > filename

UFD

A User File Directory, one of the directories listed in the MFD of a disk or partition. It may be used as a LOGIN name.

volume

A self-sufficient unit of disk storage, including an MFD, a disk record availability table, and associated files and directories. A volume may occupy a complete disk pack or be a partition within a multi-head disk pack.

volume-name

A name assigned by the MAKE operation when a disk volume is created.

PRIMOS COMMANDS**/* [comment]**

Allows comment lines in command files. See COMINPUT and COMOUTPUT. *Internal.*

ASRCWD number

Changes virtual control word which selects a device for effective output. *Not PRIMOS II. Internal.*

number	device
0	User terminal (port 1) <i>default</i>
2	Printer-2 (port 3)
4	Printer-1 (port 2)

ASSIGN { **device [-WAIT]**
DISK pdev [-WAIT]
AMLC [protocol] amlc-line [config]
SMLC [-WAIT] smlc-line }

Gives user complete control over a disk or other peripheral device. *Not PRIMOS II. Internal.*

-WAIT queues ASSIGN request until device is UNASSIGNed. (Abort via CONTROL-P.) Up to 10 disk drives may be ASSIGNed at the same time.

device

CARDR	Serial card reader [amlc line 6]
GENPR	Printer 1 [SOC port 2]
CE2PR	Printer 2 [SOC port 3]
CRn	MPC parallel card reader-n
M'Tn	Magnetic tape drive [0-7]
PRn	MPC parallel interface line printer n
PTR	Paper tape reader
PUNCH	Paper tape punch
PLOT	Printer-plotter
SMLC00-03	Communications line 0-3

protocol

TTY	Normal terminal
TTYHS	TTY with per-character interrupt
TRAN	Transparent (no character conversion)

TRANHS TRAN with per-character interrupt
TTYNOP Ignore all traffic

config

2033	110 Baud
2213	300 Baud
2323	1200 Baud [<i>default</i>]
2413	Programmable clock [<i>default=9600</i>]

ATTACH directory [password] [ldisk] [key]

Attaches to UFD or sub-UFD as current directory. Non-owner passwords may be given for PRIMOS III, IV, V only. *Internal.*

ldisk

0 thru n	Search specified logical disk.
100000	Search all disks in logical order (<i>default</i>)
177777	Search MFD of current disk

key

177777	Attach to UFD, don't change home.
0 (<i>default</i>)	Attach to UFD, set as home.
1	Attach to sub-UFD in current directory, do not set home
2	Attach to sub-UFD in current directory, set as home

AVAIL { **packname**
*
ONE
•
•
•
SEVENTEEN }

Displays disk usage statistics. Shows (in decimal) number of disk records available for use and percentage of space used in specified logical disk. *=all started disks. *External. Default = current disk.*

BASIC [filename]

Invokes Prime interpretive BASIC. *Internal.*

BASICV [filename]

Invokes compiled virtual-memory BASIC. See BASIC/VM guide.

BASINP filename

Loads non-Prime standard BASIC program from paper tape into **filename**. *External*.

BINARY filename

Opens **filename** for writing on file unit 3 for output. Equivalent to OPEN filename 3 2. *Internal*.

CLOSE { **filename** }
ALL [file-unit] ... [file-unit]

Closes specified files and file units (except a COMOUT-PUT file which is closed by COMO-E). Retrieves buffers and resets file system. *Internal*.

CMPF treename-1 treename-2 [. . . treename-5] [option]

Compares lines in up to five compressed ASCII files, showing insertions/changes/deletions from **treename-1**. *External*.

Options:

- BRIEF** Supresses display of differing lines
- MINL number** Sets minimum **number** of lines that must match (*default=3*)
- REPORT filename** Sends output to **filename**.

CMPRES filename-1 [filename-2]

Compresses ASCII file. Inverse of EXPAND. *External*. *Obsolete*.

CNAME old-name new-name

Changes name of file or directory. Requires owner status for PRIMOS III, IV or V. *Internal*.

COBOL { **treename** [option-1 . . . option-n]
[option-1] -INPUT **treename** [. . . option-n] }

Invokes COBOL compiler. *External*.

Options:

- BINARY** { **treename**
NO
[YES] }
- Specifies binary (object) file.
- INPUT treename**
- Specifies input source file.

-LISTING { **treename**
NO
[YES]
SPOOL
TTY }

Specifies the listing file.

-64R

Generate object code to run in 64R mode.

-64V

Generate object code to run in 64V mode.

-NOEXPLIST

List source code with line numbers. *Default*.

-EXPLIST

Expanded listing. Machine generated labels replace user-defined names. *64V mode only*.

COMINPUT option

Reads command input from filename instead of terminal. *Default: file-unit=6. Internal*.

Options:

filename [file-unit]
Read command input from **filename** and optional **file-unit**.

-CONTINUE

Continue original command filename.

-END

Return to terminal input.

-PAUSE

Return to PRIMOS from current command filename.

-START

Restart after CONTROL-P or WARM START. Use -CONTINUE for all other cases.

-TTY

Take input from terminal.

Notes:

1. CLOSE ALL will close the COMINPUT file-unit, causing COMINP FILE EOF.
2. Insert comments in file with /* comment

COMOUTPUT option

Sends output stream to specified filename or file opened on unit 17. At least one option must be specified. Not closed by CLOSE ALL. *Not PRIMOS II. Internal.*

Options:**[filename-1]**

Send output to **filename-1**.

-CONTINUE [filename-2]

Continue output, *overwriting* filename-1 if **filename-2** not specified.

-END

Close output file. Used instead of CLOSE.

-NTTY

Turn off terminal output including OK prompt.

-PAUSE

Stop output but *do not* close filename-1

-TTY

Turn on terminal output.

CPMPC treename [options]

Punches file on ASSIGNED card reader/punch. *Does not* punch EOF (\$E) card. *Not PRIMOS II. External.*

Options:

-CRn Card-reader/punch-n

PRINT Display cards on terminal and interpret while punching.

CREATE directory-name

Creates new UFD in MFD or sub-UFD in current directory with owner password blank, non-owner password zero and protection keys 7 0. *Internal.*

CRMPC treename [options]

Reads cards from parallel interface reader connected to MPC controller and loads card image ASCII data into file specified until: 1. End of deck; 2. \$E in columns 1 and 2; 3. Card-reader/punch STOP button hit. *Not PRIMOS II. External.*

Options:

-CRn Card-reader/punch-n
-PRINT Displays cards at terminal

CRSER filename

Reads cards from serial interface card reader into **filename**. *External. Not PRIMOS II.*

CX { **filename** } [-ON **ldisk**]
 option

Invokes sequential phantom job processor.

Options:

-A List entire audit file
-Dn Drop job number **n**
-P List user jobs in queue and audit file
-Q List queue (running and pending jobs)
-Sn List status of job number **n**
-ON **ldisk** Perform operation on local logical device **ldisk**, a remote disk.

DATE

Displays the current date and time. *Not PRIMOS II. External.*

DBASIC [filename]

Invokes double-precision interpretive BASIC.

DELAY [minimum] [maximum] [r-margin]

Sets terminal delay characteristics. Can be set prior to LOGIN. *Not Primos II. Defaults: minimum=6, maximum=12 r-margin=72.* These are for 30 CPS terminals.

DELETE filename

Deletes **filename** from current directory. Filename can be either a file or an empty directory. (For non-empty directories use FUTIL TREDEL or UFDDEL.)

DELSEG { **segno** }
 ALL

Deassigns a segment. **ALL** releases all segments belonging to user. *Internal. PRIMOS IV, V only.*

ED [filename]

Invokes the EDITOR sub-system. See the section on EDITOR commands at the back of this guide.

EDB

Invokes the binary editor subsystem. See the section on binary editor commands at the back of this guide.

EXPAND [filename-1] [filename-2]

Reverse of COMPRES. Maximum line size=720. *External.*

FILEMEM [ALL]

Clears user address space for unsegmented programs. On PRIMOS II will clear locations '100 through '47777, *except* those occupied by PRIMOS II itself. On PRIMOS III, IV and V will clear locations '100 through '77777. Using **FILMEM ALL** will: clear all user space on PRIMOS II, *except* that occupied by PRIMOS II, clear locations '100 through '177777 on PRIMOS III, IV and V. *External.*

FILVER [filename-1] [filename-2]

Compares two ASCII files for equivalence. *Not PRIMOS II. External.*

FTN

Invokes Prime FORTRAN IV compiler. See the section on FTN at the back of this guide.

FUTIL

Invokes the file manipulation utility. See the FUTIL section at the back of this guide.

HPSD

Loads version of Prime's symbolic debugger stored in upper portion of memory. Refer to the section on PSD at the back of this guide.

INPUT filename

Opens **filename** for reading on file unit 1. Equivalent to OPEN filename 1 1. *Internal.*

LABEL MTn -VOLID volume-id -OWNER owner-id -ALL access

Creates an ANSI COBOL level 1 volume label on a magnetic tape. *Not PRIMOS II. External.*

n	unit number of tape drive (0-7)
volume-id	1-6 character string
owner-id	1-14 character string (default is the LOGIN name)
access	1-character access indicator. Ignored by PRIMOS. <i>Default=blank</i>

LATE

Requests time of day in HHMM format when next command is to be processed. Terminal *cannot* be used for any other purpose until after time specified (escape via CONTROL-P). *Not PRIMOS II. External.*

LISTF

Displays current directory name, logical device and names of all files, sub-UFDs and segment directories in current directory. PRIMOS III, IV and V also display owner/non-owner status as "O" or "N". *Internal.*

LISTING filename

Opens **filename** for writing on file unit 2. Equivalent to OPEN filename 2 2. *Internal.*

LOAD

Invokes the LOAD subsystem. See the section on LOAD at the back of this guide.

LOGIN ufd-name [password] [logical-device] [-ON node-name]

Log in to specified **ufd-name**. *Not PRIMOS II.* Logs user out if one currently logged in at terminal.

LOGOUT [-user]

Log out user or phantom user. *Not PRIMOS II. Internal.*

MACHK

Turns on machine check mode. *Only PRIMOS II. Internal.*

MAGNET

Invokes the magnetic tape utility. See the section on MAGNET at the back of this guide.

MAGRST

Invokes the magnetic tape restore utility. See the MAGRST section at the back of this guide.

MAGSAV

Invokes the magnetic tape save utility. See the section on MAGSAV at the back of this guide.

MCG filename

Translates assembled microcode in **filename** for ROM simulator. *External.*

MDL

Memory dump/load to/from punched paper tape.

MESSAGE [nodename]

Waits for one line of text and sends it to operator's console of specified system. *Not PRIMOS II. Internal.*

MGRF treename-1 treename-2 [. . . treename-5] outtree-name [option-1 . . . option-n]

Merges ASCII files into specified **outtree-name**. *External.*

NUMBER

Numbers/re-numbers statements in a BASIC program. Requests intree-name, outtree-name and starting statement number (1-9999). *External.*

OPEN filename unit key

Opens **filename** on specified **unit**. *Internal.*

keys:

1	Read	1000	New SAM
2	Write	2000	New DAM
3	Read/write	4000	New SAM segment
4	Close	6000	New DAM segment
5	Delete	10000	New UFD
6	Exist		
7	Rewind		
10	Truncate		

PASSWD [owner-password] [non-owner-password]

Resets **owner** and **non-owner-passwords** for current directory. PRIMOS II owner passwords *only. Internal.* Defaults: blank owner, non-owner.

PHANTOM command-inputfile [file-unit]

Runs specified **command-inputfile** as a phantom user. *Default: file-unit=6*

PM

Displays contents of RVEC vector or user register vector. *Internal.*

PMA

Invokes Prime Macro Assembler. See section on PMA at the back of this guide.

PRERR

Displays ERRVEC message set by ERRSET and first six octal location in ERRVEC or prints ERRVEC and last error message. *Internal. PRIMOS II, III Obsolete.*

PRMPC treename

Prints **treename** on MPC parallel interface printer previously ASSIGNED. *External.*

PROTEC filename [owner-rights] [nonowner-rights]

Sets protection rights on **filename**. *Not PRIMOS II. Internal. Default: 0 0*

Rights:

0	No access	4	Delete/truncate
1	Read	5	Delete/truncate/read
2	Write	6	Delete/truncate/write
3	Read/Write	7	ALL

PRSER treename

Prints **treename** on serial interface printer previously ASSIGNED. *External.*

PRVER treename

Prints **treename** on a configured printer/plotter. Refer to PRMPC. *Not PRIMOS II. External.*

PSD

Invokes Prime Symbolic debugger. See section on PSD at the back of this guide.

PTGPY

Duplicates and verifies paper tape. Reader and punch must have been previously ASSIGNed for PRIMOS III, IV, V. *External.*

RESTORE filename [start-address] [end-address] [p] [a] [b] [x] [keys]

Restores runfile contained in **filename** into memory. *Internal.*

RESUME filename [p] [a] [b] [x] [keys]

Runs (restores and starts) external program contained in **filename**. *Internal.*

RPG

Invokes Prime RPG II language compiler. Refer to RPGII guide.

RUNOFF

Invokes Prime RUNOFF text processor. Refer to the New User's Guide to EDITOR and RUNOFF for further information.

SAVE filename start-address end-address [a] [b] [x] [keys]

Saves memory image/contents from specified **start-address** to **end-address**. Do not use with 64V segmented run files. *Internal.* Also see SEG SAVE. *Default:* Previous RVEC contents.

SEG

Invokes Prime segmented loader. See the section on SEG at the back of this guide.

SIZE treename

Displays data size of treename in records. Record is data-words/440, rounded up. *External.*

SLIST filename

Prints (displays) **filename** at user's terminal. *External.*

SORT [option-1] [option-2]

Sorts an ASCII file. Requests name of input and output files, number of fields and columns delimiting fields. Maximum number of SORT fields = 10. Maximum number of characters/record = 144. To sort in reverse specify R after closing column in field. Upper and lower case characters are sorted identically. *External.*

Options:

- BRIEF** Suppress SORT request for values
- SPACE** Delete blank lines from output file
- MERGE** Merge indicated files (maximum=10)

SPOOL

Places file in queue for line printer. See section on SPOOL at the back of this guide. *Not PRIMOS II. External.*

SPSS

Invokes Prime's SPSS subsystem. *PRIMOS IV, V only. External.* See SPSS guide.

START [location] [a] [b] [x] [keys]

Starts execution, initializes process registers and **keys** and starts execution from **location**. Assumes that program is in memory. If location not specified, execution resumes at point of interruption. *Internal.*

STATUS

{ [ALL]
DISKS
USERS
NET
UNITS }

Displays user of system status. Lists for LOGIN UFD's: logical device, open file units, physical/logical device correspondence and physical device numbers. In PRIMOS II also shows lower boundary and buffers. PRIMOS III, IV, V, disk packnames also printed. *External.* (PRIMOS II) *Internal* (PRIMOS III, IV, V). *Defaults:* information about disks, units and network.

SVCSW { [0] }
 { 1 }

Sets SVC switch, controls SVC instruction handling in virtual memory environments. *Internal*. Allows VDOS32 to run under PRIMOS III, IV, V.

- 0 Traps SVC's for processing by PRIMOS
- 1 Virtual traps SVC's for processing through user location '65.

TA pathname

Tree attach to directory location specified by **pathname**. Sets new directory to home. *External*.

TAP

Invokes Prime' Octal Mode debugger. See section on TAP at the back of this guide. *External*.

TDOS64

Runs virtual memory PRIMOS II under PRIMOS III, IV and V. *Not PRIMOS II. External*.

TERM option-1 . . . option-n

Sets terminal characteristics (resets to default explicitly or via LOGOUT). *Not PRIMOS II. External*.

Options

- BREAK { [ON] } Enable/disable BREAK key
 { OFF } equivalent to Control-P.
- DISPLAY Display current terminal characteristics.
- ERASE character Set new PRIMOS erase **character**.
- FULL Full duplex mode (*default*)
- HALF { [-LF] } Half duplex mode [-LF]=DO LF
 { -NOLF } when CR hit); -NOLF=don't
- KILL character Set new PRIMOS Kill **character**.
- NOXOFF Disable Control-S/Control-Q functions.
- XOFF Enable Control-S/Control-Q functions for inspection of screen output. (Hit Control-S to halt terminal output, Control-Q to resume.)

TIME

Displays current values in the time accounting registers. *Not PRIMOS II. Internal*.

TRAMLC { TRANSMIT } filename amlc-line [T]
 { RECEIVE }

Transmits/receives **filename** over specified **amlc-line** between compatible systems. *Not PRIMOS II. External. T* displays milestone messages.

UNASSIGN { device [-WAIT]
 { DISK pdev [-WAIT]
 { AMLC [-protocol] amlc-line [config]
 { SMLC [-WAIT] smlc-line }

Releases peripheral device (or communications line) previously ASSIGNED. See ASSIGN for parameters values. *Not PRIMOS II. Internal*.

UPCASE intreename [outreename]

Replaces all lower case letters in **intreename** with upper case letters. Output goes to **outreename** or file open on unit 2. *External*.

USERS

Displays number of current users. *Not PRIMOS II. Internal*.

VPSD

Virtual mode symbolic debugger. See section on PSD at the back of this guide for information.

VRTSSW octal-number

Sets virtual sense switches. **WARNING:** skip and sense switch instructions refer to *actual* not *virtual* sense switches. *Not PRIMOS II. Internal. Default: octal-number=0*

PRIMOS SUBSYSTEMS

DEBUGGING UTILITIES (TAP, PSD, VPSD)

For S and R mode programs. Load the object program, using the PRIMOS commands LOAD or RESTORE, and then choose which version you need. Since the debug

utility is resident in user memory with your program, make sure your program is not overlaid. For V-Mode programs, load using SEG and then run by saying SEG filename 1/1. Type the VE command to VPSD to obtain its resident address.

Terminating long operations: To terminate long operations such as DUMP, type CTRL-P to return to PRIMOS command level.

Restarting: Restart at the version's starting address. To determine this value, type a VERSION command to print the starting location. (For TAP, return to PRIMOS and do a PM.)

PSD/VPSD input/output formats: The format is established by ending any command with a colon followed by a single letter, as in: A 1000:O.

:A ASCII
 :B Binary
 :D Decimal
 :H Hexadecimal
 :O Octal
 :S Symbolic
 :L Long integer (VPSD only)
 :P AP

Expressions: only + and - operators. No literals. **Symbol use:** global symbols if the LS procedure has been used or any symbols defined within PSD. Symbolic input is only legal in access mode — i.e., "S 100 200:SAIA" is not legal. Constants entered in :S mode are octal.

Command Line Operands: These may be constants, constant expressions, or symbols. The format of a constant is:

[: format] [>] { ±digits } [: format]
 { ASCII-constant }

>=relocatable mode

Access Mode Terminators:

TAP, PSD, VPSD

CR Move to next location
 † Move to current location -1
 ? Exit from access mode; do not change contents of current location

PSD, VPSD ONLY

.n (CR) Move to current location +n.
.-n (CR) Move to current location -n.
@ Move to location addressed by instruction in current location.
(Move to location addressed by instruction in current location without following indirects
/ Return to the address of the last @
) Return to the address of the last (
= Calculate and print effective address and its contents
! Set current location to new contents and exit from access mode.

Subcommands: [input rust letters in upper-case ONLY]

ACCESS address (TAP)
 Accesses **address** in memory and waits for keyboard input in the form:

[value] tap terminator

ACCESS address (PSD, VPSD)
 Accesses **address** in the current segment and waits for keyboard input in the following form:

[:format-symbol] [value] [:new-format] terminator

BR (VPSD)
 Prints the contents of the procedure base, stack base, link base and temporary base registers.

BREAKPOINT location

Sets a breakpoint at the specified **location**.

COPY blockstart block-end target

Copies a block of memory to a new location starting at **target**.

DEFINE symbol value (PSD)

Assigns a **value** to an alphanumeric **symbol**.

DUMP block-start block-end [words-per-line]

Prints the contents of a block of memory on the terminal or, optionally, to a file previously OPENed with no parameters.

EFFECTIVE block-start block-end (PSD, VPSD)
address [mask]

Searches for an instruction with the specified effective

address in the specified block, under an optional **mask**. The current values of the register are used.

EXECUTE address [a] [b] [x] (TAP)

Executes the S- or R-mode subroutine at the specified **address**.

EXECUTE (VPSD)

Executes a segmented program by passing control to SEG.

FILL block-start block-end constant

Fills a memory block with the specified **constant**.

GO [count] [a] [b] [x] [keys] (PSD)

Proceeds from the current breakpoint. **Count** is the number of times to execute breakpoint location.

JUMPTRACE [start-add] [a] [b] (TAP, PSD)

Executes the object program and produces a diagnostic printout prior to execution of JMP, JST or HLT instruction. SVC's are not traced. Printout is:

Location: instruction A= B= X= K= R=

KEYS value (PSD, VPSD)

Sets CPU status keys to octal **value**.

LB seg-no word-no (VPSD)

Loads the link base register with a segment number and word number.

LIST address

Prints the contents of **address** in the current output format. (Does not move pointer.)

LS (PSD)

Enables the use of load map symbols. Load program and use map 10 option to create symbol file, restore program and invoke PSD, open VPSD symbol file on any unit for reading, give LS command, and close unit.

MAP (PSD)

Prints load map symbols and definitions.

MO $\left. \begin{array}{l} \text{D16S} \\ \text{D32S} \\ \text{D32R} \\ \text{D64R} \\ \text{D64V} \\ \text{D32I} \end{array} \right\}$ (PSD, VPSD)

Sets address mode.

MONITOR [start-add] [a] [b] address (TAP, PSD)

Traces the object program for a memory reference instruction whose effective address equals **address**.

NOT-EQUAL block-start block-end n-match [mask]

Searches memory block for words not equal to **n-match** under an optional **mask** [a 16-bit logical AND].

OPEN filename file-unit key (PSD, VPSD)

Opens a file to be used either as a DUMP output file or symbol table input file. **Filename** must be \leq six characters. **Key** is the same as for PRIMOS OPEN.

PATCH patch-loc branch-loc (TAP)

Replaces instruction at **branch-loc** by a jump to **patch-loc**, inserts the previous contents of branch-loc at patch-loc and enters ACCESS at patch-loc so you can key in a patch and return. Patch-loc must either be in the same sector as branch-loc or in sector 0.

PRINT (PSD, VPSD)

Prints CPU/PSD parameters in octal as follows:

p: breakpoint a b x keys relcon

PROCEED [address] [a] [b] [x] [keys] (PSD, VPSD)

Removes the current breakpoint, optionally sets a new breakpoint at **address**, and resumes execution.

QUIT (PSD, VPSD)

Returns to PRIMOS, (or SEG for SEG's VPSD).

RELOCATE value

Sets a new **value** for the access-mode relocation counter.

RUN [start-add] [a] [b] [x] [keys]

Runs the executable program starting at **start-add**.

SB seg-no word-no (VPSD)

Loads the stack base register with a segment number and a word number.

SEARCH block-start block-end match-word [mask]

Searches memory block for words equal to **match-word** under an optional **mask**.

SN seg-no (VPSD)

Sets a segment number for all commands where only a word number is entered, such as UPDATE, DUMP, etc.

SYMBOL $\begin{Bmatrix} 1 \\ 0 \end{Bmatrix}$

(PSD)

Controls the use of symbols in address typeout. **1** = symbols, **0** = no symbols.

TRACE [start-add] [a] [b] $\left[\begin{Bmatrix} \text{p-val [0]} \\ \text{-1 interval} \end{Bmatrix} \right]$

Dynamically traces program by interpretive execution of each instruction and diagnostic printout. **P-val** causes printout only when program counter = p-val. P-val **0** means printout the first time program counter = p-val and every instruction thereafter. **-1 interval** means printout every interval instructions. HLT instructions always cause printout followed by return to command mode.

UPDATE location contents

Puts **contents** into **location** and prints the old and new contents.

VERIFY block-start block-end copy

Verifies block of memory by comparing it with another block starting at **copy**. Locations that do not match are displayed as:

location block-contents copy-contents

VERSION (PSD, VPSD)

Prints the version number and restart address of the utility as an aid in restarting.

WHERE (PSD, VPSD)

Lists all currently installed breakpoints and their remaining proceed counts. A proceed count of 1 is not listed.

XB seg-no word-no (VPSD)

Loads temporary base register with a segment number and word number.

XR value (VPSD)

Loads the X register with **value**.

YR value (VPSD)

Loads **value** into the Y index register (P350 and up).

ZERO [location] (PSD, VPSD)

Removes breakpoint at specified **location** or the breakpoint at the current program-counter location.

EDITOR SUBSYSTEM

ED [filename]

Edits existing or new file. Carriage return inputs a line from the terminal. For more information refer to the NEW USER'S GUIDE TO EDITOR AND RUNOFF.

Defaults:

Erase character	"
Kill character	?
Tab character	\
Default tab settings	6, 12, 30
Command /input line terminators	; or carriage return

EDITOR SUBCOMMANDS

APPEND string

Appends **string** to end of current line.

BOTTOM

Moves pointer to bottom of work file.

BRIEF

Suppresses verification output.

CHANGE/string-1/string-2/[G] [n]

Replaces **string-1** with **string-2**, on **n** lines once or generally, [G].

DELETE [n]

Deletes **n** lines.

DELETE TO string

Deletes lines from file until **string** is found.

DUNLOAD filename [n]

Copies and deletes **n** lines from file.

DUNLOAD filename TO string

Copies and deletes line until **string** is found.

ERASE character

Makes **character** new erase character.

FILE [filename]

Files work file under **filename** or current filename.

FIND string

Finds first line below current containing **string**.

FIND(n) string

Finds first line below current containing **string** in column **n**.

GMODIFY

Alters current line as specified. See RUNOFF guide, Section 8.

Subcommands:

A/string/	Copy current line and append string
B n	Move pointer back n spaces
C character	Copy up to but not including character
D character	Skip up to but not including character
E n	Skip next n characters
F	Copy to end of line
I/string/	Insert string starting at current column
M n	Copy n characters
n	Test for "not character" in next C or D command
O/string/	Overlay string starting at current column
R/string/	Retype, using string , from current column
S	Move pointer to column 1

INPUT device

Takes input from either (ASR), (PTR), or (TTY) (*default*) device.

INSERT newline

Inserts **newline** below current line.

KILL character

Makes **character** new kill character.

LINESZ [n]

Makes **n** maximum line length.

LOAD filename

Copies **filename** into workfile.

LOCATE string

Finds first line below current line containing **string**.

MODE COLUMN

Displays banner at start of INPUT Mode.

MODE NCOLUMN

De-activates column banner (*default*).

MODE COUNT initial increment width $\left\{ \begin{array}{l} \text{BLANKS} \\ \text{ZEROS} \\ \text{SUPPRESS} \end{array} \right\}$

Activates counter symbol with these values.

MODE NCOUNT

De-activates counter.

MODE NUMBER

Activates printing of line numbers.

MODE NNUMBER

De-activates printing of line numbers (*default*).

MODE PROMPT

Displays prompts for INPUT and EDIT Modes.

MODE NPROMPT

De-activates Mode prompts (*default*).

MODE PRALL

Do not flag character case (*default*).

MODE PRUPPER

Treat as case-flagged uppers, line default upper.

MODE PRLOWER

Treat as case-flagged uppers, line default lower.

MODIFY/string-1/string-2/[G] [n]

Changes **string-1** to **string-2** without changing line alignment.

MOVE buffer-1 $\left\{ \begin{array}{l} \text{buffer-2} \\ \text{/string/} \end{array} \right\}$

Moves **string** or contents of **buffer-2** into **buffer-1**.

NEXT(n)

Moves pointer **n** lines.

NFIND(n) string

Moves pointer to next line not containing **string**.

OUTPUT $\left\{ \begin{array}{l} \text{(DISPLAY)} \\ \text{(TTY)} \end{array} \right\}$

Sends verification output to specified device (*default* = TTY).

OVERLAY string

Superimposes **string** on current line.

PAUSE

Freezes EDIT session, goes to PRIMOS-level (return via START).

POINT n

Moves pointer to line **n**.

PRINT [n]

If **n**>0, prints **n** lines; if **n**<0, backs up **n** lines and prints one line.

PSYMBOL

Prints list of current reserved characters.

PTABSET *ptab-1* *ptab-2* . . .

These are current physical tab stops on device.

**PUNCH [n] { (ASR) }
{ (PTP) }**

Punches **n** lines on indicated device.

QUIT

Leaves EDITOR without saving results of session.

RETYPE *string*

Deletes current line, replace with **string**.

SYMBOL *name* *character*

Makes **character** current value of symbol **name**.

Special Symbol Name	Character
KILL	?
ERASE	"
WILD	!
BLANKS	#
TAB	\
ESCAPE	↑
CPROMPT	\$
DPPROMPT	&
SEMICOLON	;
COUNTER	@

TABSET *tab-1* *tab-2* . . . *tab-8*

Sets these logical tab stops for EDITOR tab symbol.

TOP

Moves pointer to top of file.

UNLOAD *filename* [n]

Copies **n** lines into **filename**.

UNLOAD *filename* *TO string*

Copies lines into **filename** until **string** is found.

VERIFY

Turns on verification output [**default**].

WHERE

Prints current line number.

XEQ *buffer*

Executes contents of **buffer** as a command line.

***[n]**

Repeats preceding commands on line either **n** times or until TOP/BOTTOM reached.

BINARY EDITOR**EDB { *input-file* }
{ (PTR) } { *output-file* }
{ (PTR) }**

The binary editor is used mainly for building and maintaining subroutine libraries. **(PTR)** = paper-tape input or output. For more information refer to the Software Library manual.

Subcommands:**BRIEF**

Suppresses display of subroutine names and entry points.

**COPY { *filename* }
{ ALL }**

Copies main programs and subroutines, from EDB pointer up to **filename** or end of infile.

**FIND { *filename* }
{ ALL }**

Moves pointer to subroutine **filename** or end of infile. In VERIFY mode, display subroutine and entry names.

INSERT *treename*

Copies **treename** to outfile (*pointer unchanged*).

NEWINF *treename*

Closes outfile, opens **treename** as new input file.

OPEN *treename*

Closes outfile, opens **treename** as new output file.

QUIT

Closes *all* files, returns to PRIMOS.

REPLAC *name* *treename*

Replaces subroutine **name** or containing name with **treename**.

RFL

Writes reset forceload flag block in outfile.

SFL

Writes set forceload flag block in outfile.

TERSE

Enters terse mode (*displays first entry point only*).

TOP

Moves pointer to top of file.

VERIFY

Enters VERIFY mode (displays all subroutine names and entry points). (Default).

FORTRAN IV COMPILER

FTN { **treename [options]**
[option] -INPUT treename [options] }

Invokes FORTRAN compiler. For more information refer to the FORTRAN Programmer's Guide.

Options: (• - indicates Prime-supplied defaults)

Specify Input/Output Devices

-BINARY { **treename**
NO
[YES] }

Specifies binary (object) file.

-INPUT treename

Specifies source program file.

-LISTING { **treename**
[NO]
YES
TTY
SPOOL }

Specifies listing file.

-SOURCE treename

Same as INPUT.

Enable Listings/Cross References

- ERRLIST** Print error-only listing
- **-ERRTTY** Print error messages at user terminal
- EXPLIST** Print listing including assembler output
- **-LIST** Print source program and error listing
- NOERRTTY** Suppress error messages to terminal
- **-NOTRACE** Suppress global trace
- **-NOXREF** Suppress cross-reference listing
- TRACE** Enable global trace
- XREFL** Print full cross-reference listing
- XREFS** Print partial cross-reference listing

Memory Usage

- BIG** Handle arrays spanning segment boundaries (64V only)

- DEBASE** Conserve loader base areas
- DYNM** Enable dynamic allocation of local storage (64V only)
- **-NOBIG** No arrays spanning segment boundaries
- **-SAVE** Static allocation of local storage
- **-32R** Generate code to run in 32R mode.
- 64R** Generate code to run in 64R mode.
- 64V** Generate code to run in 64V mode.

Operations

- DCLVAR** Flag undeclared variables
- **-FP** Generate floating-point skip instructions
- INTL** INTEGER default is INTEGER*4
- **-INTS** INTEGER default is INTEGER*2
- **-NODCLVAR** Do not flag undeclared variables
- NOFP** Suppress generation of floating-point skip instructions
- SPO** Special library compilation

FUTIL — FILE MANIPULATION UTILITY

FUTIL is the interactive file manipulation utility. It responds with a prompt character, >, and waits for subcommands. For more information refer to the PRIMOS Commands manual.

Subcommands:

ATTACH pathname

Attaches to new directory; make it "home".

CLEAN prefix [level]

Deletes files beginning with **prefix**, for indicated number of **levels** (default=1).

COPY from-name [to-name] [,from-name [to-name]]...

Copies named SAM or DAM files from FROM directory to TO directory. If **to-names** are omitted, copies have same names as originals.

COPY (from-position) [(to-position)]

Copies from one segment directory to another. If **to-position** is omitted, copy goes to same position as original.

COPYDAM

Same as COPY but sets file type of copy to DAM.

COPYSAM

Same as COPY but sets file type of copy to SAM

CREATE directory [owner-passwd [non-owner passwd]]

Creates **directory** in current TO directory (with optional passwords).

DELETE { **file-a** [**file-b**] ...
 { (**position-a**) [(**position-b**)]... }

Deletes from FROM directory named files or, in segment directories, deletes files at specified positions.

FORCE { **ON**
 { **OFF** } }

ON forces read-access rights in FROM for LISTF, LISTSAVE, SCAN, UFDPCY and TRECPY. **OFF** stops FORCE action (*default*).

FROM pathname

Defines FROM directory for subsequent commands such as COPY, LISTF, etc.

LISTF [**level**] [**FIRST**] [**LSTFIL**] [**SIZE**]
 [**PROTEC**] [**RWLOCK**] [**TYPE**] [**DATE**]
 [**PASSW**]

Lists files and attributes at terminal (and into optional file named LSTFIL).

LISTSAVE filename [**level**] [**FIRST**] [**SIZE**]
 [**PROTEC**] [**RWLOCK**] [**TYPE**]
 [**DATE**] [**PASSW**]

Same as LISTF, with the LSTFIL option specified, but writes output to **filename**.

PROTECT filename [**owner-access** [**non-owner-access**]]
Sets protection attributes for **filename**.

SCAN filename [**level**] [**FIRST**] [**LSTFIL**]
 [**SIZE**] [**PROTEC**] [**RWLOCK**]
 [**TYPE**] [**DATE**] [**PASSW**]

Searches FROM directory tree for all occurrences of specified **filename** and prints requested attributes.

SRWLOC filename lock-number

Sets per-file read/write lock.

TO pathname

Defines TO directory for subsequent commands such as CREATE and all copying commands.

**TRECPY directory-a [directory-b]
 [**directory-c** [**directory-d**]]...**

Copies directory tree(s) in FROM directory into TO directory.

TREDEL directory-a [directory-b]...

Deletes directory tree(s) in FROM directory.

TREPRO pathname [owner-access [non-owner-access]]

Sets protection rights for directory and contents (*default 1 0*).

TRESRW pathname lock-number

Sets per-file read/write locks for all files in **pathname**.

UFDPCY

Copies *entire* FROM directory into TO directory.

UFDDEL

Deletes *entire* FROM directory.

UFDPRO [owner-access [non-owner-access [level]]]

Sets protection attributes for *entire* FROM directory.

UFDSRW lock-number n-levels

Sets per-file read/write lock for **n-levels** in FROM directory.

Lock number	Meaning	Code
0	Use system R/W lock	SYS
1	n readers OR 1 writer	W/NR
2	n readers AND 1 writer	1WNR
3	n readers AND n writer	NWNR

LOAD SUBSYSTEM

Invokes virtual loader for loading sectored and relative code in one segment (64K maximum — see SEG LOAD). Treenames may be used to specify files except in ATTACH and SAVE. External.

LOAD SUBCOMMANDS

ATTACH [directory] [password] [ldisk] [key]

Attaches to specified UFD.

AUTOMATIC base-length

Inserts base area of specified length at end of routine if >300 locations loaded since last base area.

CHECK [symbol-name] [offset-1]...[offset-9]

Checks value of current PBRK against symbol or number.

Symbol-name is a 6 character symbol defined in the

symbol table. **Offset-1** thru **9** are summed to form an address or offset from symbol name. Numbers preceded by "-" are negative.

COMMON address

Moves top/starting COMMON location to **address**.

DC [END]

Defers definition of COMMON block. **[END]** turns off DC.

ENTIRE treename

Saves entire state of loader as runfile, along with temporary file, for building overlays.

ERROR n

Determines action taken in case of load errors.

n	Meaning
0	SZ errors treated as multiple indirect, others act as n=1.
1	Display multiple indirects on TTY but continue LOAD; abort load of file for all other errors.
2	Abort to PRIMOS

EXECUTE [a] [b] [x]

Starts execution with specified register values.

F/ $\left. \begin{array}{l} \text{FORCELOAD} \\ \text{LIBRARY} \\ \text{LOAD} \end{array} \right\} \text{treename [parameters]}$

Forceloads all modules in specified object file. See LOAD for parameters.

HARDWARE definition

Specifies expected level of instruction execution.

CPU	Definition
P400	57
P300/FP	17 FP = Floating Point
P300	3
P200/HSA	1 HSA = High-speed
P100/HSA	1 arithmetic
P200	0
P100	0

HARDWARE, if given, must precede loading of UII library.

INITIALIZE [treename] [parameters]

Initializes LOADER and optionally does a LOAD. See LOAD for parameters.

LIBRARY [treename] [loadpoint]

Loads specified file from library UFD.

LOAD treename [parameters]

Loads the specified object module. The parameters may be entered in three formats:

1. **loadpoint [setbase-1]...[setbase-8]**
2. *** [setbase-1]...[setbase-9]**
3. **symbol [setbase-1]...[setbase-9]**

In form 1 **loadpoint** is the starting location of the load. In form 2 the load starts at the current PBRK location (*). In form 3 the load address can be stated symbolically (**symbol**). The remaining numeric parameters (**setbase-1**, etc.) specify the size of linkage areas to be inserted before and after modules during loading. If the last parameter is '177777, the loader requests more setbase values.

MAP [treename] [option]

Generates load-state map. If **treename** is omitted, map is displayed at TTY.

Option:	Meaning
0	Load state, base area, symbol storage map; symbols sorted by address (<i>default</i>)
1	Load state only
2	Load state and base area
3	Unsatisfied references only
4	Same as 0
5	System Programmer map
6	Undefined symbols, sorted alphabetic
7	All symbols, sorted alphabetic
10	Special symbol map for PSD (in a file)

MODE $\left. \begin{array}{l} \text{D32R} \\ \text{D64R} \\ \text{D16S} \\ \text{D32S} \\ \text{D64V} \\ \text{D32I} \end{array} \right\}$

Specifies address resolution mode for next load module (32K Relative is *default*). If used, MODE must precede other LOAD commands.

P/ { **FORCELOAD**
LIBRARY
LOAD } [parameters]

Begins loading at next page boundary. See LOAD for parameters.

PAUSE

Leaves loader to execute internal PRIMOS command. Return via START.

PBRK { [symbol-name] [offset-1]...[offset-9] }
*offset-1 [offset-2]...[offset-9]

Sets a program break to value of **symbol** plus **offset** or a number. * treats sum of numbers as offset from current PBRK. Offsets 2 thru 9 may be negative.

QUIT

Deletes temporary file, closes map file (if loader opened it), and returns to PRIMOS.

SETBASE { [base-start] [base-range] }
* base-range

Defines starting location and size of base area. * is current value of PBRK.

SS symbol-name

Save symbol. Exempts specified symbol from action of XPUNGE.

SYMBOL { symbol-name [offset-1]...[offset-6] }
* offset-1 [offset-2]...[offset-6]

Establishes locations in memory map for common blocks, relocation load points, or to satisfy unsatisfied references. * is current value of PBRK. **Offsets** are summed; 2 thru 6 may be negative.

SZ { **YES** }
{ **[NO]** }

Permits/prohibits links in sector zero

VIRTUALBASE base-start to-sector

Copies base sector to corresponding locations in **to-sector**. Used for building RTOS modules.

MAGNET MAGNETIC TAPE UTILITY

MAGNET is an interactive magnetic tape utility that transfers non-Prime-format magnetic tapes to and from PRIMOS disk files. MAGNET prints a release number and a date and then requests the user to enter an option.

The user may then issue one of the four option commands. Each option conducts a dialog. The queries and responses are described below.

POSITION

Positions the tape to a specified file and record number. Absolute position rewinds tape before spacing. Relative position allows tape to be moved forward or backward from the current position.

READ

Transfers a file from magnetic tape to disk, optionally providing unblocking and EBCDIC or BCD translation.

WRITE

Similar to READ but transfers file from disk to tape. WRITE also provides facilities for blocking and character translation.

COPY

Copies a file (or files) from one magnetic tape to another. No character translation is provided for this operation.

MAGNET DIALOG QUERIES

Prompt

Response

MTU #

Physical unit number followed by /7 (seven-track) or /9 (nine-track - default).

RELATIVE
OR ABSOLUTE?

ABSOLUTE: file and record numbers are relative to beginning of tape. Must be positive.

RELATIVE: file and record number are relative to current position. May be positive (forward) or negative (backward). 0 = current position.

FILE # OR
MT FILE

Absolute file number of relative number of records to forward or backspace.

LOGICAL
RECORD SIZE
BLOCKING FACTOR

Number of bytes in a disk record. Must be 2K or less.

Number of logical records (line images) in one tape record.

ASCII, BCD,
BINARY OR EBCDIC?

Type of translation desired between tape and disk. **ASCII** = none, **BCD** = BCD to ASCII, etc.

FULL OR PARTIAL? **FULL** = translate entire line.
PARTIAL = translate specified fields.

ENTER PARTS OF ...etc. Enter starting/ending column numbers, one pair per line. Terminate with CR.

OUTPUT FILENAME Disk file to be created during READ.

INPUT FILENAME Disk file used as source of WRITE.

'FROM' tape MTU # of tape to be copied.
'TO' tape MTU # of tape to relative copy.

MAGNETIC TAPE RESTORE UTILITY

MAGRST [-7TRK]

Restores files, directory-trees or partitions from a magnetic tape created with MAGSAV. Under PRIMOS III, IV or V the tape unit must be ASSIGNED. The MAGRST dialog is as follows:

Query	Possible Responses
TAPE UNIT:	(0-7) Physical unit number
ENTER LOGICAL TAPE NUMBER:	1 = 1st logical tape, 2 = 2nd etc. Rewinds and positions tape. 0 = tape already positioned
READY TO RESTORE:	YES (Restore entire tape) NO (Request new tape drive and logical tape numbers) PARTIAL (Restore part of tape) \$I [filename] n print index to n levels to terminal or optional filename. NW n print n-level index at terminal but do not update disk (debugging)
TREENAME:	Enter treename for partial restore.

MAGNETIC TAPE SAVE UTILITY

MAGSAV [option]

Writes a PRIMOS disk file, directory-tree or partition to 7 or 9-track magnetic tape. Under PRIMOS III, IV or V the tape unit must be ASSIGNED.

Options:

-LONG 1024-word records (*default=512*)
-INC Incremental dump
-UPDT Set DUMPED bit
-7TRK 7-track tape format (*default=9 track*)

The MAGSAV dialog is as follows:

Query	Possible responses
TAPE UNIT:	(0-7) physical tape unit
ENTER LOGICAL TAPE NUMBER:	1 = 1st logical, 2 = 2nd, etc. Rewinds and repositions tape. 0 = already positioned.
TAPE NAME:	Any number
DATE:	Valid date in format mm dd yy. (<i>default = current date</i>)
REV. NO:	Any number.
NAME:	filename to be saved or one of the following: \$A Change home UFD. \$Q Terminate logical tape and return to PRIMOS \$R Do \$Q and rewind tape. \$I [filename] n Index to n levels. MFD Save entire disk. (<i>Must be attached to MFD</i>) * Save current directory.

Record Sizes: 448-word (PRIMOS) or 1024-word (Storage Module).

PRIME MACRO ASSEMBLER

PMA filename [option-1. . .option-n]

$\left\{ \begin{array}{l} \text{-INPUT} \\ \text{-LISTING} \\ \text{-BINARY} \end{array} \right\}$	filename
--	----------

Invokes Prime's Macro Assembler. For more information, refer to the PMA Programmer's Guide.

Options:

- EXPLIST** Full assembly listing, reset A-register bit A2, set bit A3, force listing file generation.
- ERRLIST** Generate error only listing, reset bit A3, set bit A2, force listing file generation.
- RESET** Resets A, B, and X registers.

SEGMENTATION UTILITY

SEG *treename*

Invokes SEG for loading, modifying and running segmented (V-mode) code. PRIMOS IV, V only. See the PMA manual.

DELETE [*filename*]

Deletes a saved SEG runfile.

HELP

Prints abbreviated list of SEG commands at terminal.

[V]LOAD [*treename*]

Defines runfile name and invokes virtual loader for creation of new runfile.

[V]LOAD * [*treename*]

Specifies existing runfile and invokes virtual loader for appending.

LOAD SUBPROCESSOR COMMANDS

ATTACH [*ufd-name*] [*password*] [*ldisk*] [*key*]

Attaches to directory.

A/SYMBOL *symbolname* [*segtype*] *segno size*

Defines a symbol in memory and reserves space for it using absolute segment numbers.

COMMON $\left\{ \begin{array}{l} \text{[ABS]} \\ \text{REL} \end{array} \right\}$ *segno*

Relocates COMMON using absolute or relative segment numbers.

D/ $\left\{ \begin{array}{l} \text{IL} \\ \text{LOAD} \\ \text{LIBRARY} \\ \text{FORCELOAD} \\ \text{PL or RL} \end{array} \right\}$

Continues a load using parameters of previous LOAD
Note: D/ and F/ may be combined, as in D/F/LI.

EXECUTE [*a*] [*b*] [*x*]

Saves loaded image on disk and executes program.

F/ $\left\{ \begin{array}{l} \text{IL} \\ \text{LOAD} \\ \text{LIBRARY} \\ \text{FORCELOAD} \\ \text{PL} \\ \text{RL} \end{array} \right\}$ [*filename*] [*addr psegno lsegno*]

Forceloads all routines in object file.

IL [*addr psegno lsegno*]

Loads impure FORTRAN library IFTNLIB.

INITIALIZE [*treename*]

Initializes and restarts load subprocessor.

LIBRARY [*treename*] [*addr psegno lsegno*]

Loads library file (from LIB=UFD, if no *treename* specified).

LOAD [*treename*] [*addr psegno lsegno*]

Loads object file.

MAP [*filename*] *option*

Generates load map (see SEG - level MAP command).

MIXUP $\left\{ \begin{array}{l} \text{[ON]} \\ \text{OFF} \end{array} \right\}$

Mixes procedure and data in segments and permits loading of linkage and common areas in procedure segments. *Not* reset by INITIATE.

MV [*start-symbol move-block desegno*]

Moves portion of loaded file (For libraries). If options are omitted, information is requested.

OPERATOR *option*

Enables or removes system privileges. 0 = enable, 1 = remove. *Caution:* this command is intended only for knowledgeable creators of specialized software.

PL [*addr psegno lsegno*]

Loads pure FORTRAN library, PFTNLB.

P/ $\left\{ \begin{array}{l} \text{IL} \\ \text{LOAD} \\ \text{LIBRARY} \\ \text{FORCELOAD} \\ \text{PL} \\ \text{RL} \end{array} \right\}$ [*filename*] *option* [*psegno*] [*lsegno*]

Loads on a page boundary. The options are: **PR** = procedure only, **DA** = link frames only, **none** = both procedure and link frames.

QUIT

Returns to PRIMOS command level.

RETURN

Returns to SEG command level.

RL treename [addr psegno lsegno]

Replaces a binary module in an established runfile.

R/SYMBOL symbolname [segtype] segno size

Defines a symbol in memory and reserves space for it using relative segment assignment. (*Default* = data segment).

SAVE [a] [b] [x]

Saves the results of a load on disk.

SE segno length

Creates base area for desectorization.

SS symbol-name

Saves symbol : prevents XPUNGE from deleting symbol-name.

SPLIT $\left\{ \begin{array}{l} \text{segno addr} \\ \text{addr} \\ \text{addr ssegno saddr lsegno} \end{array} \right\}$

Splits segment into data and procedure portions. Formats 2 and 3 allow you to run from R mode; if all loaded information is in segment 4000.

STACK size

Sets minimum stack size.

SYMBOL [sname] segno addr

Defines a symbol at specific location in a segment.

S/ $\left\{ \begin{array}{l} \text{IL} \\ \text{LOAD} \\ \text{LIBRARY} \\ \text{FORCELOAD} \\ \text{PL} \\ \text{RL} \end{array} \right\} \begin{array}{l} [\text{filename}] \\ \text{addr psegno lsegno} \end{array}$

Loads an object file in specified absolute segments.

XP dsymbol dbase

Expunges symbol from symbol table and deletes base information.

dsymbol Action

- 0** delete only entry points, leaving COMMON areas
- 1** delete all defined symbols - including COMMON area

dbase Action

- 0** retain all base information
- 1** retain only sector zero information
- 2** delete all base information

End of LOAD subprocessor

MAP $\left\{ \begin{array}{l} \text{treename-1} \\ * \\ \text{treename-2} \\ \text{[map-option]} \end{array} \right\}$

Prints a loadmap of **treename-1** or current loadfile (*) at terminal or optional **treename-2**.

options:

- 0** Full map (*default*)
- 1** Extent map only
- 2** Extent map and base areas
- 3** Undefined symbols only
- 4** Full map (identical to 0)
- 5** System programmer's map
- 6** Undefined symbols, alphabetical order
- 7** Full map, sorted alphabetically
- 10** Symbols by ascending address
- 11** Symbols alphabetically

MODIFY [filename]

Invokes MODIFY subprocessor to create a new runfile or modify an existing runfile.

MODIFY SUBPROCESSOR COMMANDS**NEW treename**

Writes a new copy of SEG runfile to disk.

PATCH segno baddr taddr

Adds a patch (loaded between baddr and taddr) to an existing runfile and saves it on disk.

RETURN

Returns to SEG command level.

SK $\left\{ \begin{array}{l} \text{ssize} \\ \text{segno addr} \\ \text{ssize 0 esegno} \\ \text{ssegno addr esegno} \end{array} \right\}$

Specifies stack size (ssize) and location. **esegno** specifies an extension stack segment.

START segno addr

Changes program execution starting address.

WRITE

Writes all segments above '4000 of current runfile to disk.

End of MODIFY subprocessor

PARAMS [filename]

Displays the parameters of a SEG runfile.

PSD

Invokes VPSD debugging utility.

QUIT

Returns to PRIMOS command level and closes all open files.

RESTORE [treename]

Restores a SEG runfile to memory for examination with VPSD.

RESUME [treename]

Restores runfile and begins execution.

SAVE [treename]

Synonym for MODIFY.

SHARE [treename]

Converts portions of SEG runfile corresponding to segments below '4001 into R-mode-like runfiles.

SINGLE [treename] segno

Creates and R-mode-like runfile for any segment.

TIME [treename]

Prints time and date of last runfile modification.

VERSION

Displays SEG version number.

VLOAD

See LOAD.

SPOOLER FOR PRINTER/PLOTTER

SPOOL [treename] [option(s)]

Queues disk files for line printer or plotter. For more information refer to the PRIMOS commands manual.

Options:

-CANCEL PRTxxx Remove from spool queue
-DEFER [time] Defer printing until specified **time**
-EXPAND Expand compressed file before printing

-FORM name Request to operator to load specified paper form
-FTN Obey FORTRAN output conventions in file

-FUNIT fileunit Specify From-unit (*default = 1*) range 1-16

-HOME Do not print file on remote printer (for Primenet)

-LIST option(s) List all specified spool-queue entries

options	meaning
ALL	All files (<i>default</i>)
DEFER	Deferred files
FORM type	Forms of specified type (<i>default = ' '</i>).
OWN	Files spooled under users login name
PLOT	File in plot queue
PRINT	Files in print queue
-LNUM	Generate line numbers. Incompatible with FTN option.
-NOFMT	No format control (header, generation/pagination) User must inset own line-printer control codes
-OPEN filename 2	Open specified file on file unit 2 for read-only
-PLOT [nwords]	Indicates plot file nwords is decimal number of words to be read/output per raster scan (<i>default = 128</i> , for 200 raster, inch plotter)
-TUNIT fileunit	Specify To unit. (1-16)

