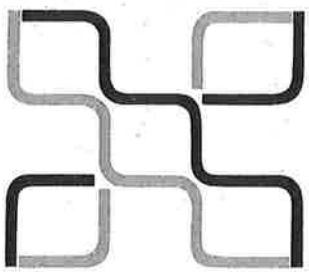
POLYSYS
UTILITIES
MANUAL



polycorp

POLYSYS UTILITIES MANUAL

VERSION 2.3

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CONTENTS

1. INTRODUCTION

1.1. MODES OF OPERATION

This manual describes the Disk Operation System (DOS) and TEXT modes of operation of the POLY 1 Computer System. The BASIC mode of operation is described in the POLYBASIC Manual. As well, instructions are given for initialising and setting up disks, printer operation is summarized and some details of hardware/software interfaces are described.

The three fundamental modes of operation of a POLY are:

DOS,

BASIC, and

TEXT.

To enter DOS mode from BASIC or TEXT, enter (i.e. type and then press the ENTER key) DOS.

To enter BASIC mode from DOS or TEXT, enter BASIC.

To enter the TEXT mode from DOS or BASIC, enter TEXT.

Note that a user of courseware on a POLY need not be aware of these three fundamental modes of operation since courseware operation is fully automatic and menu-driven.

1.2. FILE STORAGE AND NAMING CONVENTIONS

Data and programs are stored on disk as files.

File names may be up to 8 characters long. The first character must be alphabetic and the remainder must be alphanumeric. File names maybe followed by a "." and a one to three letter extension. Some extensions have been associated with specific types of files.

BASIC full text source files	.BAS
BASIC compiled files	.BAC
Operating system commands	.CMD
Data files	.DAT
Print files	.PRT
Operating system files	.SYS
Text files	.TXT

If the file is on a particular drive then the drive number may be added to the filename either at the beginning or the end, separated from the file name by a ".".

For example:

1.PROG1.BAS or PROG1.BAS.1

Both associate the file PROG1.BAS with drive 1.

If a drive number is not specified then the current default drive will be used. Upgraded POLY 1 computers have a local RAMdisk facility comprising 48K bytes of RAM. RAMdisk is referred to as drive 4 and may be used in exactly the same way as physical disk drives. Files loaded into RAMdisk have extremely fast access times for both reading and writing.

Disks used in the POLY 1 Computer System may be single or double sided. Before use, disks must be formatted (see the FORMAT utility). Double-sided disks are formatted (in single density) to contain 2280 sectors each of which contains 256 bytes. Single-sided disks contain 1140 sectors. Of the 256 bytes in each sector, 252 are available for storage. RAMdisk is formatted on start up, or by use of the DOS utility RDFORMAT, to contain 187 sectors.

Part of each disk (and RAMdisk) is used to contain a catalogue or directory of all files stored on the disk (or RAMdisk). Such catalogues may be listed on the screen (or printed) using the CAT utility.

The total number of sectors available on a disk or RAMdisk may not necessarily add up to 1140 or 2280 or 187 if the directory requires more than 5 sectors since extra sectors will be taken for the directory from those available as required.

The actual storage of files on disk (or in RAMdisk) is managed automatically by the Disk Operating System.

1.3. STANDARD OPERATING SYSTEM FILES

The following table is a catalogue of a standard POLY Version 2.3 Operating System disk containing only operating system files. Such a disk may be used to start up (or "boot", in computer jargon) a POLY Computer System (as described in the POLY System Operating Manual). A POLY computer started up using such a disk will display a blue log on screen and when a user logs on will go directly into BASIC mode.

TABLE 1.

DIRECTORY OF DRIVE NUMBER 1
DISK: POLY23 _1 CREATED: 13-DEC-84

NAME	TYPE	R	SIZE	DATE	PRT
POLYNET	.SYS		44	11-DEC-84	WD
PLYSYS	.SYS		24	12-DEC-84	WD
POLYACS	.SYS		17	30-APR-84	WD
ERRORS	.SYS	R	43	31-JUL-84	WD
BASIC	.CMD		36	6-JUN-84	WD
TEXT	.CMD		1	5-MAY-83	WD
CAT	.CMD		5	14-NOV-84	WD
CLEAN	.CMD		3	22-DEC-83	WD
COPY	.CMD		4	9-JUN-83	WD
DATE	.CMD		2	27-JUL-82	WD
DRIVE	.CMD		1	31-JAN-83	WD
FASTCOPY	.CMD		7	30-NOV-84	WD
FORMAT	.CMD		8	30-NOV-84	WD
GPRINT	.CMD		30	10-JUN-83	WD
KILL	.CMD		3	17-APR-84	WD
LINK	.CMD		1	29-JAN-80	WD
LIST	.CMD		3	13-JUN-83	WD
LOGOFF	.CMD		1	11-DEC-84	WD
PATCH	.CMD		6	22-JUL-83	WD
PCOPY	.CMD		4	27-APR-84	WD
PRINT	.CMD		5	10-DEC-84	WD
PROT	.CMD		3	11-DEC-84	WD
RDFORMAT	.CMD		2	23-NOV-84	WD
RECOVER	.CMD		7	30-NOV-84	WD
RENAME	.CMD		1	29-JAN-80	WD
SCOPY	.CMD		4	3-MAY-84	WD
SDC	.CMD		7	13-JUN-83	WD
WTD	.CMD		2	8-JUN-84	WD
POLYTEST	.BAC		28	29-NOV-84	WD
BRT23	.CMD		9	9-JAN-84	WD
MEMTST4	.CMD		4	20-DEC-83	WD
VDEOTEST	.BAC		2	2-MAR-82	WD
LOGON	.BAC		6	18-JAN-85	WD

FILES=33, SECTORS=323
LARGEST=44, FREE=1957

The four files with extension SYS comprise the fundamental operating system. POLYNET runs in the PROTEUS (or network controller/disk drive if an earlier system is being used - throughout this manual, PROTEUS is synonymous with network controller/disk drive) handling communications and the sharing of disk storage and other peripherals. POLYSYS runs in the POLY handling communications with the PROTEUS and file and resource management within the POLY. POLYACS contains the alternate (normally 60-column) character set and is automatically loaded at start up, if it exists. This is necessary for selecting screen 5 for text from BASIC. Note that a warm start will cause POLYACS to be disabled until the POLY is re-booted. ERRORS contains full descriptions of any that may arise during POLY operation.

The twenty-five files with extension CMD are the POLY Operating System Utilities or Commands described in this manual.

POLYTEST, BRT23, MEMTST4 and VDEOTEST form the POLY Computer System test suite.

LOGON is the program automatically executed in each POLY at start up producing the POLY log on screen. LOGON may be replaced by a user-written or user-specified program to perform security checks or other functions, as required.

The master copy (and back-ups created using the FASTCOPY utility) of the standard operating system disks (both single and double sided) should be kept in safe-keeping.

1.4. PROGRAMMING AND COURSEWARE DISKS

The operating system disk described previously may be used as a BASIC programming disk.

A version of Omegasoft Pascal is available for POLY. A Pascal programming disk will contain the standard operating system files described above plus the necessary command and utility files that comprise Pascal on POLY.

Other programs, for example, the 6809 Text Processor (copyright TSC Inc.), may be added to an operating system disk as required.

A courseware or authoring disk will normally contain the standard operating system, a MENU program, plus the courseware or authoring programs. The MENU program is automatically chained to by LOGON after the user has completed the log on procedure. Selecting menu items will cause the corresponding programs to be loaded and run. Upon completion, the menu program will be returned to, thus providing fully automatic operation.

Software (courseware, authoring systems, Pascal, etc.) will normally be supplied on a non-operating system disk. The user should then create a copy of the master operating system disk and copy the supplied software onto the created disk, labelling it appropriately. The supplied disk should then be stored in safe-keeping.

2. DISK OPERATING SYSTEM UTILITIES

2.1. INTRODUCTION

The DOS utilities are provided on all standard operating system disks. Each utility is a separate file with an extension of .CMD. A utility is executed from DOS by entering the file name (the .CMD extension is not required).

Where possible, utilities are executed in the POLY utility area so that the BASIC program or TEXT currently loaded is not affected. Such utilities may be run from BASIC and TEXT by putting a + in front of the utility name. The utilities that will not run in the utility work space must be run from DOS. The availability of a utility is detailed under the description of each particular utility.

For example:

In DOS mode entering

```
CAT 0
```

will provide a catalogue of the files on the disk in drive 0. In BASIC and TEXT modes

```
+CAT 0
```

will do the same.

In this manual all examples are given as if executed in DOS mode.

The utilities expect either a space or a comma to separate the parameters.

For example:

```
CAT 0 .BAS
```

is exactly the same as

```
CAT,0,.BAS
```

If a semi-colon immediately follows the utility name, then the utility will load and pause, prompting for any key to be pressed before beginning execution. It is then possible to change disks.

For example:

If you have CAT on one disk and you wish to obtain a catalogue of the files on another disk that does not have CAT on it, then enter

```
CAT;
```

When CAT is loaded it will pause so that you may change disks. Press any key to obtain the required catalogue.

Most utilities are loaded from the disk into the POLY for execution and do not interfere with other users. However, for efficiency reasons, some utilities are executed in the PROTEUS. While these utilities are being executed, other POLYs on the system will not be able to gain access to the disk drives. Such utilities are CLEAN, COPY, FASTCOPY, FORMAT and RECOVER.

All utilities, except those mentioned above that execute in the PROTEUS, may be executed from RAMdisk (after being copied to RAMdisk, i.e. drive 4, using the SCOPY utility).

2.2. COMMAND DESCRIPTIONS

In describing the command syntax, the following conventions are used:

-Words in capital letters must be entered exactly as written.

-Words in small letters must be replaced by the user with a specific filename or other word as required.

-Words enclosed in square brackets ([ ]) are optional and may be omitted.

-Underlined words must be entered if that part of the option is used.

-In examples, the user responses to queries are shown underlined.

For example:

Syntax:- CAT [drive-list] [match-list]

allows any of the following to be used:

```
CAT
CAT 1
CAT MYFILES
CAT 0 MYFILES
```

2.2.1. BASIC

Availability:- Available in DOS mode only.

Syntax:- BASIC [filename]

The BASIC command loads POLYBASIC (including all RAM-based extensions) from disk.

If a file name is specified (default extension .BAC), then the file will be loaded and executed as a BASIC program. If no filename is specified, then immediate mode is entered.

For example:

BASIC

loads the extensions to BASIC and enters immediate mode.

BASIC,MENU

loads the extensions to BASIC, then loads and executes MENU.BAC

2.2.2. CAT

Syntax:- CAT [drive-list] [match-list]

The CAT utility displays names of the files on a disk. The drive-list may be one or more drive numbers, and the match-list can be a series of filenames, extensions or abbreviations of both to allow 'masked' viewing of the file names in the directory.

For example:

CAT 0 LL2.BAS

lists only those filenames on drive 0 beginning with LL2 and having extensions of .BAS.

CAT

lists all filenames on the current disk drive assigned to that POLY.

CAT,1,P.T,MA

lists those files on drive 1 which begin with P and have extensions beginning with T, and files beginning with MA.

CAT,0,1,TYP,.SYS

lists all files on drives 0 and 1 which either begin with TYP or have extensions of .SYS.

CAT also displays other information about the file.

For example:

```
NAME  TYPE  R  SIZE    DATE      PRT

POLYEX .BAC      27   26-FEB-85  W
```

The R if present, indicates the file is a random access type data file. The size is given in 256 byte sectors. The date is the date on which the file was created. The PRoTection code is a list of protection attributes assigned to the file

(see the PROT utility).

2.2.3. CLEAN

Availability:- Available in DOS mode only.

Syntax:- CLEAN

The CLEAN command is used in conjunction with Head Cleaning Kits. For best results, disk heads should be cleaned every one to two weeks. Run CLEAN then insert the head cleaning disk in the drive to be cleaned as prompted by CLEAN. CLEAN ensures that the disk heads are active and contact the surface of the cleaning disk.

NOTE: While CLEAN is running, all the other disk activity is suspended.

2.2.4. COPY

Syntax:- COPY filename1 filename2
COPY filename drive
COPY source-drive destination-drive [match-list]

The COPY command copies files. If a system has only a single disk drive attached, SDC (Single Disk Copy) must be used to copy files from one disk to another. COPY can only be used in a single drive system to produce a copy of a file on the same disk under a new name.

If the file to be created already exists, a request to delete it is displayed. Pressing Y causes the file to be overwritten.
All copied files retain the date and protection of the original.

For example:

COPY may be used on a single disk in the first form. If this is done then the filenames must be different.

```
COPY 0.DEMOPR.TXT 0.DEMOUP
```

This copies 0.DEMOPR.TXT to 0.DEMOUP.TXT.

The extension of the input file must always be specified, but for the output file this is optional as it defaults to the extension of the input file.

COPY may be used to copy between drives. If the drive is not specified, then the current drive for that POLY is used.

COPY may not be used to copy to and from RAMdisk (drive 4), see SCOPY.

For example:

If the current drive is 0, then

```
COPY DEMOPR.TXT DEMPOUP
```

copies 0.DEMOPR.TXT to 0.DEMOUP.TXT.

When copying from one drive to another, the file may retain its original name.

For example:

```
COPY 0.FILE23.BAC 1
```

This copies FILE23.BAC from drive 0 to drive 1.

Finally, COPY can be used to copy all files from one drive to another or only those corresponding to a match list.

For example:

```
COPY 0 1
```

will COPY all files from drive 0 to 1.

```
COPY 1 0 .BAS .TXT
```

will COPY all files from drive 1 to drive 0 that have extensions of .BAS or .TXT.

```
COPY 0 1 DATA PROGR.C
```

will copy all files from drive 0 TO 1 that have names beginning with DATA as well as those that begin with PROGR and have extensions beginning with C.

The name of each file copied is displayed on the POLY screen.

NOTE: While COPY is running, all other disk activity is suspended.

2.2.5. DATE

Syntax:- DATE

At startup, the first POLY activated will request the date and time to be entered. This information is sent to the PROTEUS, and then sent to each POLY in the network as they are started up.

The DATE utility allows the user to input the date and time from a POLY, if the PROTEUS has been reset or otherwise initialised. If the PROTEUS already has a valid date, then DATE will not ask for a new date and time, and the POLY date and time will be updated from the PROTEUS.

Only the POLY from which DATE was run, and the PROTEUS date and time are changed. Other POLYs on the network have the previously set date and time until they are restarted or until DATE is run.

For example:

After the PROTEUS has been reset, enter

DATE

Enter date DD,MM,YY 20 1 85

Enter time HH,MM 9 12

This will set the PROTEUS and POLY dates to 20 January 85 and the times to 9:12:00.

2.2.6. DRIVE

Availability:- Available in DOS mode only.

Syntax:- DRIVE drive-number

This utility duplicates the DRIVE command in BASIC and TEXT modes. That is, DRIVE reassigns the current drive for a particular POLY.

For example:

DRIVE 1

This causes the POLY to use drive 1 as its current drive.

2.2.7. FASTCOPY

Syntax:- FASTCOPY source-drive destination-drive

FASTCOPY duplicates all of the information stored on the disk in the source-drive onto the disk in the destination-drive. Two drives are required. The destination disk cannot have any faulty sectors (see FORMAT).

FASTCOPY copies sector by sector rather than file by file and so a corrupt disk, or one in which files are scattered all over it, will be reproduced exactly as the original. FASTCOPY will overwrite anything already on the disk being copied onto.

For example:

FASTCOPY 0 1

will duplicate the information on the disk in drive 0 onto the disk in drive 1.

NOTE: While FASTCOPY is running, all other disk activity is suspended.

2.2.8. FORMAT

Syntax:- FORMAT [drive]

FORMAT is used to format a new disk or reformat an old one. FORMAT must be used on all new disks before they can be used. If drive is not entered with the command, then FORMAT will ask for the drive.

For example:

```
FORMAT 1

ARE YOU SURE? Y
```

(indicates that formatting is desired, N is pressed to abort format)

```
DOUBLE SIDED DISK? Y
```

(or N for single sided disks)

```
VOLUME NAME? POLY
```

(up to 7 characters with the same rules as file names)

```
VOLUME NUMBER? 1
```

(up to a 4 digit number)

```
IS THE DISK TO BE FORMATTED IN DRIVE 0? Y
```

(N to abort formatting)

NOTE: Inputs to the queries do not require a terminating <ENTER> except in the case of volume name and number.

When the process is complete, a message stating the total number of sectors formatted is displayed. For a single-sided disk this should be 1140 sectors, 2280 for a double-sided disk.

FORMAT checks for disk surface defects. If a faulty sector is found on a part of the disk required by the POLY operating system, then the FORMAT is aborted. If this occurs remove the disk from the drive, reinsert it and try again. If this proves unsuccessful after another try then assume the disk is unable to be used.

If faulty sectors occur on other parts of the disk, then these are reported and formatting continues. These disks may be used but FASTCOPY cannot be used to copy onto the disk.

Do not turn single-sided disks over to use the other side, as the protective sleeves have dust collecting surfaces on the inside which are not intended for use in a reversed direction.

FORMAT may be used in a single drive, but the disk to be formatted must be placed in the drive before answering the final question.

To prevent formatting a master disk (containing FORMAT.CMD) accidently, it is a good idea to protect the disk by removing the tab from the disk protection notch.

NOTE: While FORMAT is running, all other disk activity is suspended.

2.2.9. GPRINT

Availability:- Available in DOS mode only.

Syntax:- GPRINT

GPRINT is used to print the POLY graphics screens. The program asks for various parameters for printing the screen.

For example:

Start row (0-203) 0

row 0 is the first row to be printed

Start column (0-239) 0

column 0 is the first column to be printed

End row (0-203) 200

row 200 is the last row to be printed

End column (0-239) 239

column 239 is the last column to be printed

Size (1 or 2) 1

the size of the printed picture is normal. (Entering 2 would select double size.)

Screens (24) 2

screen 2 is to be printed (Screens 2, 4 or 2 and 4 can be printed).

Output filename ? SCRNDMP

the output filename for the picture will be SCRNDMP. (Any valid filename can be used. The extension defaults to .LST, .PRT extensions should not be specified.)

The result of the above example will be the file SCRNDMP.LST which will contain a complete copy of screen 2, and can be printed with the command

```
PRINT SCRNDMP.LST NG
```

NOTE: This utility will only work with EPSON MX-series printers with the bit-image graphics option.

2.2.10. KILL

Syntax:- KILL [drive-list] [match-list]

KILL is used to delete files from disk.

Before deleting a file a check is made.

```
Delete "FILENAME" ?
```

Any reply other than Y will leave the file intact and proceed to the next file , but if Y is pressed then the file is deleted. <ENTER> is not required after the reply, and <ENTER> as the reply will cause KILL to terminate.

For example:

```
KILL MYFILE.BIN
```

will delete MYFILE.BIN from the disk on the current drive for that POLY.

```
KILL 1 FILE.CMD 0 DATES.TXT
```

will delete FILE.CMD from drive 1, and DATES.TXT from drive 0.

Files may be protected against any attempts to KILL them by Delete or Write protecting them (see PROT for the control of such protection).

If no filenames are given in a KILL command then the files on the disk are presented one by one for deletion. If Y is pressed, then the file is deleted. Pressing any other key leaves the file intact. Make sure that all write and delete protection is removed from files to be deleted prior to running KILL in this manner.

For example:

```
KILL 4
```

will give the option to delete all files from RAMdisk.

```
KILL 0 PP
```

will give the option to delete all files starting with PP on drive 0.

NOTE: Do not delete files on the print queue, the print may be stopped using PRINT -filename (see the PRINT command).

2.2.11. LINK

Syntax:- LINK filename

The filename will normally be POLYNET.SYS. LINK sets up a pointer on the disk to POLYNET.SYS, causing it to be loaded into the PROTEUS whenever the PROTEUS is turned on or reset. LINKing must be done before a disk can be used for automatic loading. All operating system disks supplied by POLYCORP and PROGENI will have previously been linked.

For example:

```
LINK 1.POLYNET.SYS
```

will LINK the disk on drive 1 to POLYNET.SYS, which must be on the disk.

A disk created using FASTCOPY does not need to be LINKed if the original disk has been LINKed. A disk created using COPY, PCOPY or SDC must be linked.

2.2.12. LIST

Syntax:- LIST filename [startline - endline] [+N]

LIST lists the contents of program, text and data files on the screen. Entire files or only selected lines may be listed.

The drive number may be included in the filename. If the file extension is not specified, the extension defaults to .TXT. The numbers of the first and last lines to be displayed may be specified - otherwise the whole file is LISTED.

For example:

```
LIST 1.TESTPR.BAS
```

will produce

```
10 REM TESTPROGRAM
20 REM TESTPROGRAM
50 REM TESTPROGRAM
70 REM TESTPROGRAM
100 END
```

on the screen.

```
LIST 1.TESTPR.BAS,1-4
```

will produce

```
10 REM TESTPROGRAM
20 REM TESTPROGRAM
50 REM TESTPROGRAM
70 REM TESTPROGRAM
```

on the screen.

```
LIST 1.TESTPR.BAS 3-
```

will produce

```
50 REM TESTPROGRAM
70 REM TESTPROGRAM
100 END
```

on the screen.

Note that the range indicates the actual line numbers of the lines and not BASIC line numbers. +N causes actual line numbers to be printed.

2.2.13. LOGOFF

Availability:- Available in DOS mode only.

Syntax:- LOGOFF

LOGOFF is used to exit DOS (like LOGOFF from BASIC), returning to the magenta start up screen.

2.2.14. OVERRIDE

Availability:- Available in DOS mode only.

Syntax:- OVERRIDE

The OVERRIDE utility may be used to over-ride the protection on a file. Log on to a POLY with initials and password, enter DOS mode and run OVERRIDE. OVERRIDE sends the current initials and password to the PROTEUS as a master password, and this overrides normal passwords. PROT can then be run so protection can be removed from files on which the passwords have been forgotten. Access to this utility must be restricted to supervisors, and so OVERRIDE is provided on its own normally on a single-sided disk.

2.2.15. PATCH

Availability:- Available in DOS mode only.

Syntax:- PATCH [filename]

PATCH may be used to patch binary files. (For example, the print spooler in POLYNET.SYS may require patching for different makes of printer, see Section 5. If a filename is not specified, a filename will be requested. The default extension is .CMD. The appropriate file will be loaded and PATCH will display a menu.

M - Display and change contents of specified memory locations. Enter the required memory location as a hexadecimal number. The contents of that memory location will be displayed.

Pushing NEXT will display the contents of the next successive memory location.

Pushing BACK will display the contents of the immediately preceding memory location.

Typing a two-digit hexadecimal number will cause the contents of the specified memory location to be altered.

Pushing ENTER will cause return to the menu.

T - Transfer a complete section of the program from one position in memory to another.

The file range (the memory address range of each section of the program) will be displayed. A current address (in hexadecimal) must be entered to identify the section of the program to be transferred. Then the new address (in hexadecimal) must be entered so that the transfer may be made.

Pushing ENTER at any stage will return to the menu.

X - Abort execution of PATCH without change to the specified file.

S - Save the specified file to the same location on disk that it was read from. (Note that some nulls contained in the original file may be removed when a file is PATCHed. Note also that if POLYNET.SYS is PATCHed, it is not necessary to LINK it.)

2.2.16. PCOPY

Availability:- Available in DOS mode only

Syntax:- PCOPY filename1 filename2
PCOPY filename drive
PCOPY source-drive destination-drive [match-list]

The PCOPY command is the same as the COPY utility, except it allows the user to selectively copy files and PCOPY will copy to and from RAMdisk (drive 4). PCOPY can only be used on a single drive system to produce a copy of a file on the same disk under a new name.

For example:

```
PCOPY 0 1 GEOG
```

will display all files whose names begin with GEOG, giving the option of having each one copied (Y) or not (N). <ENTER> is not required after the Y or N. Pressing any other key will cause PCOPY to abort.

```
COPY COMPLETE
```

is displayed when PCOPY is complete.

NOTE: While PCOPY is running, other disk activity continues.

2.2.17. PRINT

Syntax:- PRINT filename [options]
PRINT -filename

The PRINT command is used to print a file on the printer. The file is not directly printed but rather put on a queue awaiting print, a technique known as print spooling. The default extension for the filename is .TXT. The following options are available:

D - Double spacing: This causes double vertical spacing on the printout.

N - No headings: Where this is not specified headings take the form of a double row of asterisks in between which appear a date and time stamp, and the name of the file being printed.

C - Compressed print: This will cause compressed characters to be printed.

E - Elongated print: This will cause elongated characters to be printed. In the case of the EPSON MX80 printer, there are normally 80 characters per line. In compressed mode, there are 132 characters per line; in elongated mode, 40 characters per line. Defaults for these may be specified using PATCH (see section 5).

O - Emphasized print: This will cause characters to be over-printed.

G - Graphics print: This disables automatic line feeds and carriage returns and other special translations by the print spooler, allowing the user to control the spacing and to print control characters. This is especially intended for printing graphics. Only the N option will have any effect when the graphics option is selected.

X - Delete after printing: This will cause the file to be deleted after it has been printed.

- Print # for Teletext #: The Teletext hash # character has the same internal value as the ASCII underscore (_) character. Since the POLY utilizes the Teletext character set and most printers use the ASCII character set, hashes will normally be printed as underscores. Specifying this option will cause the conversion of the Teletext hash character to the ASCII hash character (so INPUT #1 will be printed as INPUT #1 rather than as INPUT _1).

Pn - Paging: The n is an optional page length (the default is 60). When P or say P40, is specified, then either the default number of lines or 40 lines respectively, will be printed before a form feed is issued.

Wn -Page width: This option may be used to set the page width to n.

To delete a file from the print queue (even if it is printing) put a "-" sign in front of the filename.

PRINT without any parameters will display the contents of the print queue.

For example:

```
PRINT POLYPR DNCP40
```

will print the file POLYPR.TXT using double spacing, with compressed characters, with no heading and with 40 lines per page.

```
PRINT -POLYPR
```

will abort the printing of POLYPR.TXT.

2.2.18. PROT

Syntax:- PROT filename [option-list]

This command is used to change the PROTection attributes of a file. Protection against deleting, writing to, and referencing of by other users, a file may be set by PROT. Until PROT has been run, a file may be referenced, rewritten, renamed or deleted.

The filename is the name of the file to be protected. The option-list may contain any number of the following protection codes.

D - Delete: To protect a file so that it cannot be deleted by KILL or from within a program. The file may still be changed.

W - Write: To write protect a file so that it may not be deleted or renamed or have anything written to it. It is automatically delete protected.

C - Catalogue: To catalogue protect a file so that it will not be displayed when CAT is executed. (However, To display these files, KILL with no file names may be used.)

P - Password: To protect a file with a password generated from the user's password entered when the user logged on. Access to this file will only be allowed by logging on with the same password. (It is remotely possible for two users to generate the same password.)

X - Remove: Removes all protection from the specified file.

For example:

```
PROT FASTCOPY.CMD WP
```

will write protect and password protect the file FASTCOPY.CMD.

```
PROT SECRET.TXT XDC
```

will remove all previous protection from the file SECRET.TXT, delete protect it and prevent it being displayed by CAT.

2.2.19. RDFORMAT

Availability:- Available in DOS mode only (but may be safely EXECed from BASIC).

Syntax:- RDFORMAT

RDFORMAT is a utility for formatting RAMdisk. All files previously loaded to RAMdisk will be removed.

For example:

```
RDFORMAT
```

formats RAMdisk.

2.2.20. RECOVER

Availability:- Available in DOS mode only.

Syntax:- RECOVER [drive]

The RECOVER utility tries to recover missing sectors from a disk. If a drive is not entered, then the current disk drive is assumed.

For example:

```
RECOVER 1

Are you sure ? Y
```

(indicates that recovering is desired, N is pressed to abort recover)

```
Disk to be recovered in drive 1? Y
```

(N to abort recover)

2.2.21. RENAME

Available:- Available in DOS mode only.

Syntax:- RENAME filename1 filename2

RENAME performs the same function as RENAME from TEXT or BASIC. Filename 1 is the file you wish to RENAME and filename2 is the new name. The default extension for filename1 is .TXT and the default drive is the current drive. The default extension for filename2 is that of filename1 and no drive is required.

For example:

```
RENAME 1.PROG.BAS LKT.BAS
```

will rename the file 1.PROG.BAS, if it exists, as 1.LKTBAS.BAS

2.2.22. SCOPY

Syntax:- SCOPY [*] filename1 filename2
SCOPY [*] filename drive
SCOPY [*] source drive destination-drive [match-list]

The syntax and function of SCOPY are exactly the same as COPY with two exceptions. SCOPY runs in the POLY rather than the PROTEUS and thus may be used to copy files to and from RAMdisk (drive 4). The optional asterisk, if present, will cause the suppression of all print messages.

Thus SCOPY may be used from a BASIC program (using the EXEC command) and not print messages on the screen.

For example:

```
SCOPY 4.PROG.BAC 0
```

will copy PROG.BAC from drive 4 (RAMdisk) to drive 0, printing appropriate messages.

```
SCOPY * 1.POINTS.DAT 4
```

will copy POINTS.DAT from drive 1 to Ramdisk without printing messages on the screen.

2.2.23. SDC

Availability:- Available in DOS mode only.

Syntax:- SDC filename1 filename2
SDC filename drive
SDC source-drive dest-drive [match-list]

The SDC command (Single Disk Copy) is used to copy files from one disk to another using a single drive. This utility is similar in operation to COPY. The source and destination drive specified must be the same.

Before each file is read, the message:

Insert source disk & press a key

is displayed. Insert the disk that the file is to be copied from. When a key has been pressed, the file being copied is read into the memory of the Poly.

When complete,

Insert destination disk & press a key

is displayed. Insert the disk that the file is to be copied to then hit a key. When the file has been copied a message is returned. When copying multiple files, the above process repeats until all the specified files have been copied.

For example:

SDC TESTPR.BAS

copies the file TESTPR.BAS from one disk to another using the current drive.

If a multiple drive system is available use COPY or PCOPY, they are much faster.

If the file being copied is larger than the amount of memory available, then the source and destination disks will have to be interchanged as many times as necessary until all the file is copied. If an error occurs it will be necessary to insert the destination disk so that SDC may delete temporary files.

2.2.24. TEXT

Availability:- Available in DOS mode only.

Syntax:- TEXT [filename]

The TEXT command loads the POLY text editor (see section 4 of this manual). If a file name is specified (default extension .TXT), then the file will be loaded ready to be edited.

For example:

```
TEXT
```

loads the text editor.

```
TEXT MYPROG
```

loads the file MYPROG.TXT ready for editing.

2.2.25. WTD

Availibility:- Available in DOS mode only.

Syntax:- WTD filename utility-command
WTD + utility-command

If WTD (Write To Disk) is placed in front of a POLY utility command, then the output from the utility normally displayed on the screen will be directed to the specified file or to the printer (the + option).

The default extension for filename is .PRT i.e. a printfile.

For example:

```
WTD PRFILE LIST TESTPR.BAS 1-3 +N
```

will list lines 1 to 3 of the file TESTPR.BAS into the file PRFILE.PRT which will then be automatically printed and deleted.

```
WTD + CAT 0
```

will print the catalog for drive 0, using a spooler-generated filename for the printfile.

3. SETTING UP A NEW DISK

Users may purchase and set up disks themselves. The disks may be either single or double sided and be either single or double density. Currently, all disks are recorded as single density, either single or double sided.

3.1. FORMATTING THE DISK

Each disk must be formatted before it can be used for storage on the POLY system. The DOS utility FORMAT is used to format the disk. This may be run either from BASIC as +FORMAT, or from DOS as FORMAT.

3.2. CREATING OPERATING SYSTEM DISKS

Both single-sided and double-sided copies of the master operating system disk should be stored safely as back-up copies. A master copy of a disk should be protected by removing the tab from the disk protection notch.

It is recommended that, if a disk is to be used to start the system up, all operating system files (as in the catalogue in Table 1) be present on the disk. Operating system files may be copied to a formatted disk from a master operating system disk using FASTCOPY.

If SDC, COPY or PCOPY are used to copy POLYNET.SYS then LINK must be used to link the disk to POLYNET.SYS. This is not required when FASTCOPY is used.

The minimum set of operating system files necessary on a disk to be used for start up are:

POLYNET.SYS
POLYSYS.SYS
POLYACS.SYS
BASIC.CMD
LOGON.BAC

3.2.1. SINGLE DRIVE SYSTEMS

1. Start the system up in the normal manner using the master operating system disk and enter

   DOS

2. Format the new disk. Enter

FORMAT 0

When the question ARE YOU SURE? is asked, change the programming disk for the new disk before proceeding.

Answer the questions. On conclusion of format, the number of sectors formatted on the disk is displayed. This should be 2280 sectors for double-sided disks and 1140 for single-sided disks.

3. Copy the operating system files onto the new disk using SDC, with the master disk as source and the new disk as the destination.

4. Link the new disk by entering

LINK 0.POLYNET.SYS

3.2.2. MULTI-DRIVE SYSTEMS

1. Start the system up in the normal manner using the master operating system disk in drive 0, and enter

DOS

2. Put the new disk in drive 1.

3. Enter the following sequence of commands with the appropriate responses:

FORMAT 1
FASTCOPY 0 1

3.3. CREATING COURSEWARE DISKS

Supplied courseware and software will normally be released on disks not containing an operating system. To create a disk containing the operating system and the supplied courseware, carry out the following steps.

1. FORMAT a scratch disk (either single or double sided, as appropriate).

2. Make a FASTCOPY of your Master Version 2.3 Operating System Disk (either single or double sided as appropriate) onto this newly formatted disk. (Put the Master Disk away.)

3. With the FASTCOPY disk from step 2 in drive 0 and the supplied disk in drive 1, execute COPY 1 0 from DOS (or +COPY 1 0 from BASIC) and copy all files from the supplied disk to the new disk. (MENU.BAC will normally be one of these files.)

4. Label the disk from drive 0 appropriately. Put the supplied disk away as a master.

If you have a single disk drive and you are supplied with courseware or software on a non-operating system disk, then carry out the above procedure except all copying in steps 2 and 3 must be performed using SDC. We recommend you print catalogues of the source disks so that you know which files to specify when using SDC. And remember to LINK the disk after the SDC of POLYNET.

When transferring programs and files to other POLY users, it is advisable to exclude operating system software from the disk used for the transfer. This is because other POLY users may have different versions of POLY hardware and software (maybe they simply have a different brand of printer for which their operating system has been customised).

3.4. REPLACING LOGON.BAC

Following start up, LOGON.BAC is automatically run and the blue log on screen will appear. The supplied LOGON.BAC may be replaced by other versions depending on user requirements. For example, a log on program to carry out more extensive security checking, such as checking a file of valid users, could be substituted for the supplied LOGON program. Or, if no security checking at log on is required at all then a simple program such as

```
     10 CLS:NEW
or
     10 CLS:TEXT
or
     10 CLS:DOS
or
     10 CHAIN "MENU"
```

may be substituted for LOGON depending on the user requirements of the particular disk. These four programs, when each is compiled as LOGON.BAC onto a disk, will respectively cause the following to occur when the disk is used to start up a POLY: direct entry to BASIC mode, direct entry to TEXT mode, direct entry to DOS mode, and direct chaining to the MENU without logon procedures.

Of course, if the supplied LOGON is replaced and the logon procedures by-passed, then when PROT is used to password protect a file, no initials and password will have been entered. In such a case, PROT will request that the user enter these at the time of running PROT.

The supplied LOGON automatically chains to a program called MENU.BAC after successful log on, provided such a program exists. The MENU program can be a standard supplied MENU, a user-written MENU (compiled BASIC) or a MENU generated using POLYMENU.

4. THE POLY EDITOR

The POLY system provides a full screen editor which can be used to edit either BASIC or TEXT files.

BASIC mode is available from TEXT and DOS via the BASIC command. The prompt Ready will appear printed in yellow. The extensions normally used for BASIC files are BAS and BAC. In BASIC mode line numbers are part of the file. In BASIC mode, whenever a program is edited, all variable values are reinitialised and any files left open are closed.

TEXT mode is entered from BASIC or DOS via the TEXT command. The prompt Ready is always printed in cyan. The extension normally used for text files is .TXT. In TEXT mode line numbers are not part of the file, they are added to the lines when loading (starting at 10, with intervals of 10) and deleted when saving. In TEXT mode line numbers are used to reference lines for listing, deleting and inserting.

4.1. ENTERING NEW LINES

All new lines are entered with a line number at the start which indicates the position in the file into which the line is to be inserted. If the line number is omitted the line is treated as an immediate command. Entering a line is the act of typing the line and pressing the <ENTER> key.

The cursor may be moved back to an incorrect line and the line corrected. The line is re-inserted into the file on pressing the <ENTER> key. If <ENTER> is not pressed, the line is only stored on the screen and is not updated in memory.

4.2. USING THE AUTO COMMAND

The AUTO command is used to save time when entering new lines, it automatically sets up the line numbers.

Syntax:- AUTO [start-line] [,increment]

The start-line is the first line number at which the automatic numbering will start. If not specified, 10 is used.

The increment is the amount added to each line number to get the next number. If not specified, 10 is assumed.

For example:

```
AUTO
```

starts automatic line numbering at 10 with an increment of 10, i.e. 10 20 30 40 ...

AUTO 100, 200

starts automatic line numbering at 100 with increments of 200, i.e. 100 300 500 ...

In BASIC mode, the next line number is displayed, as soon as <ENTER> has been pressed for the previous line.

In TEXT mode, the line numbers are not displayed on the screen but are incremented in memory each time <ENTER> is pressed.

To exit from AUTO mode either enter a null line (i.e. just press <ENTER> at the start of a new line) or press <EXIT>.

AUTO will not allow the entering of lines with line numbers the same as those already entered.

4.3. LOOKING AT LINES ALREADY ENTERED

The LIST command displays text already entered, on the screen.

Syntax:- LIST [startline] [-] [endline]

Startline and endline refer to the line numbers as entered. If startline is not specified, then the listing starts at the beginning of the file. If endline is not specified the listing will stop at the end of the file. The <PAUSE> is used to halt the listing at any time. To restart the listings, press any key. If the <SPACEBAR> is pressed following <PAUSE>, then the lines are listed one at a time. If the <EXIT> key is pressed, then the listing is terminated.

If only the startline number is specified then only that line is displayed.

For example:

LIST

displays the whole file.

LIST 100

displays only line 100.

LIST 100-

displays all lines from 100 to the end.

LIST -100

displays all lines up to 100.

```
LIST 100-200
```

displays lines 100 to 200 inclusive.

4.4. ALTERING LINES

To alter a line, list it on the screen using LIST, move the cursor up to the line using the arrow keys, make the alterations necessary, and press <ENTER>.

While changing a line, the <CHAR INS> and the <CHAR DEL> keys may be used for insertion and deletion of characters on that line.

<ENTER> may be pressed when cursor is anywhere on the line, it does not necessarily need to be at the end of the line.

The <LINE INS> and <LINE DEL> keys enable lines to be inserted and deleted on the screen but do not cause changes to the POLYBASIC program or text file in memory.

4.5. DELETION OF LINES

A line may be deleted by either:

(i) entering the line number with no data following it, or

(ii) by use of the DEL command.

The DEL command may be used to either delete individual lines or a group of lines from memory.

Syntax:- DEL startline [-endline]

The startline must be given. If the -endline is missing, only the startline is deleted.

For example:

```
DEL 280
```

deletes line 280.

```
DEL 280 - 1000
```

deletes lines 280 to 1000 inclusive.

NOTE that the following forms are NOT allowed:

```
DEL 280-
```

or

```
DEL -1000
```

4.6. RENUMBERING OF LINES

At times, all available line numbers in a particular sequence may have been used. Alternatively, due to a large number of insertions and deletions the line numbers may be badly distributed. In both these cases, it is advisable to use the RENUM command to renumber the file.

Syntax:- RENUM [startline] [,increment]

Renumbering a BASIC file not only changes the line numbers but also changes all references to them in GOTO, GOSUB and other statements. RENUM may also be used to renumber part of a file (see the description of the RENUM command in the POLYBASIC manual).

Renumbering a TEXT file only changes the line numbers.

The startline is the first line number allocated. If not given, 10 is used.

The increment is the amount added to each succeeding line number. If not given, 10 is used.

For example:

```
RENUM
```

renumbers the file from line 10, in increments of 10, i.e. the new line numbers are 10, 20, 30, 40 ...

```
RENUM 100
```

renumbers the file from 100 in increments of 10, i.e. the new line numbers are 100, 110, 120, 130 ...

```
RENUM ,100
```

renumbers the file from 10 in increments of 100, i.e. the new line numbers are 10, 110, 210, 310 ...

```
RENUM 1000,100
```

renumbers the file from 1000 in increments of 100, i.e. the new line numbers are 1000, 1100, 1200 ...

4.7. SAVING THE EDITED FILE ON DISK

At any stage during editing, the file may be saved using the SAVE command. A BASIC file is saved with line numbers, a text file is saved without line numbers.

Syntax:- SAVE "filename"
SAVE

The filename may specify the extension and the drive number.

For example:

SAVE "0.MYFILE.TXT"

If the drive number is not given then the file is written to the current drive for that POLY.

If the extension is not given then a BASIC file is given the extension .BAS and a TEXT file the extension .TXT.

Following a SAVE, the file is still in the POLY memory and further editing may be performed.

For example:

SAVE "MYFILE"

If the POLY is in TEXT mode and the current dirve is 0, then the file will be saved on drive 0 as MYFILE.TXT.

SAVE may be used without a file name if the file has been previously LOADed from disk. In this case the user will be prompted with

Save filename (Y/N) ?

where filename is the name of the file that was LOADed.

4.8. LOADING FILES FROM DISK

A file stored on disk is loaded into POLY memory using the LOAD command. This clears any program or file currently in POLY memory, and loads the file from disk.

Syntax:- LOAD "filename"

The filename may specify the drive number and the extension.

For example:

LOAD "1.MYFILE.BAS"

will load MYFILE.BAS from the disk in drive 1.

If the drive number is not given, then the file is loaded from the current drive for that POLY.

If the extension is not specified then .BAS is used in BASIC mode and .TXT in TEXT mode.

When a TEXT file is loaded, line numbers are added, starting at 10 and incrementing in steps of 10.

For example:

```
LOAD "MYFILE"
```

If entered on a POLY with the current drive as 1 and in TEXT mode, then the file 1.MYFILE.TXT will be loaded into the POLY memory, starting at line 10 and incrementing in steps of 10.

4.9. MERGING FILES ON DISK WITH THE FILE BEING EDITED

The MERGE command merges a file from disk into the file currently being edited. BASIC files are merged on line number such that where the same line exists in both files, the new line replaces the old line.

In TEXT mode, the disk file is appended onto the end of the file being edited and line numbers above those currently in use are allocated.

Syntax:- MERGE "filename"

The filename may specify the drive number and the extension.

If the drive number is not given, then the file is loaded from the disk on the current drive for that POLY.

If the extension is not specified then, for BASIC .BAS is assumed, and for TEXT, .TXT is assumed.

For example:

If a POLY (in BASIC mode) contains the following file:

```
10 CLS
20 FOR row = 0 TO 10
30 PRINT @(row,0) "11Q"
40 NEXT row
```

and the file MYFILE.BAS on disk contains:

```
30 PRINT @(row,0) "  R";
50 REM DRAW A CAR
60 REM etc...
```

then when the command:

```
MERGE "MYFILE"
```

is entered, the resulting file in the POLY will be:

```
10 CLS
20 FOR row = 0 TO 10
30 PRINT @(row,0) "  R";
40 NEXT row
50 REM DRAW A CAR
60 REM etc...
```

If a POLY (in TEXT mode) contains the following file:

```
100 THIS IS A TEXT FILE
200 CONTAINING ONLY
300 3 LINES
```

and the file MYTEXT.TXT contains:

```
THIS IS MYTEXT
FILE WHICH HAS
ONLY 3 LINES
```

then following the command:

```
MERGE "MYTEXT"
```

the POLY file becomes:

```
100 THIS IS A TEXT FILE
200 CONTAINING ONLY
300 3 LINES
310 THIS IS MYTEXT
320 FILE WHICH HAS
330 ONLY 3 LINES
```

4.10. DELETING THE FILE BEING EDITED

The NEW command deletes the file currently being edited from memory.

For example:

```
NEW
```

If the file being edited has not been changed the Ready prompt will appear on the screen. If the file has been changed since the last SAVE the user will be prompted with

```
Save (Y/N) ?
```

or

Save filename (Y/N) ?

The filename will only appear if the file was LOADed. In the first case if Y is typed, the NEW is aborted; if N is typed, the NEW is executed. In the second case, if Y is typed the file will be SAVEd and NEW executed; if N is typed, NEW will be executed. Only Y,y,N or n will be accepted. The default extensions are .TXT for TEXT files and .BAS for BASIC files.

5. INSTALLING AND USING THE PRINTER

The printer in a POLY system is shared by all the POLYs. All print requests are queued onto disk before printing, a technique known as print spooling. There are several ways of having information printed.

5.1. PRINTING EXISTING FILES FROM DISK

Existing files may be printed using the DOS PRINT command in the form

```
PRINT filename
```

They may be removed from the queue, even after printing has started by entering

```
PRINT -filename
```

For further details, see PRINT in this manual.

5.2. PRINTING DOS UTILITY OUTPUT

DOS commands normally display their output on the POLY screen. This output may be printed instead by using the WTD (Write To Disk) command in conjunction with the DOS utility command.

For example:

```
WTD + CAT 0
```

will print the catalogue on the printer using the file SPnnnnnn.PRT as the intermediate file, where nnnnnnn is a unique 6 digit number.

```
WTD filename.PRT CAT 0
```

where a specific filename is given as the print queue file name. Any file that is created with .PRT extension is automatically printed and then deleted. Further details of WTD are given under the description of WTD in this manual.

5.3. PRINTING FROM A PROGRAM

To print from a BASIC program use the LPRINT command (see the POLYBASIC manual). Output from LPRINT will be printed when the program stops executing. It is also possible to print from a program by creating a disk file with a .PRT extension. When the CLOSE of that file is issued, that file is automatically printed and deleted. This method may be used from both BASIC and PASCAL programs. If it is necessary to retain the file, it may be created with any other extension, and the DOS PRINT command used to print it out. Files with a .PRT extension may not contain graphics characters - the PRINT command with a G option must be used to print the file and all control characters (including carriage return and line feed) must be supplied. Files may be deleted after printing using the X option of the PRINT command.

5.4. INSTALLING THE PRINT SPOOLER

Various brands of printers may be attached to a PROTEUS for use by a POLY network. Either a serial or a parallel interface may be utilized. Each brand of printer has a set of control characters for special functions such as condensed characters, elongated characters, emphasized characters, etc. As well, printers may be of different widths.

The PATCH utility may be used to modify the print spooler for different types of printers.

Patching the Print Spooler so that the POLY Operating System uses the appropriate Printer Port

Program to be PATCHed: POLYNET.SYS

Memory Location (Hex)		Value (Hex)	Function
4808		FF	PROTEUS Parallel Printer Port
	(Default)	00	PROTEUS Serial Printer Port
		01	POLYDRIVE Serial Printer Port

Patching the Print Spooler to Operate with Different Makes and Models of Printers

1. A table with relevant entries has been set up within POLYNET.SYS to allow easy patching for different models and makes of printers (unfortunately most different brands of printers use control characters for different purposes).

2. Attached is a table showing memory locations, default values for the EPSON MX80 printer, and functions of the various locations.

3. To alter for other brands or models of printer, use PATCH to alter appropriate locations. The program that must be PATCHed is POLYNET.SYS. Unused locations should contain null(00).

TABLE 2

PRINTER SPOOLER PARAMETER AREA

Memory Location	Default Value	Function
5415	3C	Number of lines/page (default 60)
5416	3C	Ignore
5417	50	Number of normal characters/line (80)
5418	84	Number of compressed characters/line (132)
5419	28	Number of elongated characters/line (40)
5495	0E]	4 control characters necessary to produce elongated characters
5496	00]	
5497	00]	
5498	00]	
5499	00	Null (terminator)
549A	0A]	Ignore (line feeds)
549B	0A]	
549C	0F]	4 control characters necessary to produce compressed characters
549D	00]	
549E	00]	
549F	00]	
54A0	00	Null (terminator)
54A1	0A]	Ignore (line feeds)
54A2	0A]	
54A3	00]	4 control characters necessary to produce normal characters
54A4	00]	
54A5	00]	
54A6	00]	
54A7	00	Null (terminator)
54A8	0A]	Ignore (line feeds)
54A9	0A]	
54AA	1B]	4 control characters necessary to produce characters
54AB	45]	
54AC	00]	
54AD	00]	
54AE	00	Null (terminator)

Memory Location	Default Value	Function
54AF	12]	
54B0	14]	
54B1	1B]	
54B2	32]	
54B3	1B]	
54B4	39]	12 control characters necessary to initialise the printer
54B5	1B]	
54B6	46]	
54B7	00]	
54B8	00]	
54B9	00]	
54BA	00]	
54BB	00	Null (terminator)
54BC	12]	
54BD	00]	6 control characters necessary to reset the printer
...	]	
54C1	00]	
54C2	00	Null (terminator)
54E7	0E]	
54E8	1B]	8 control characters necessary to produce elongated, double-printed characters for the heading
54E9	45]	
54EA	00]	
...	]	
54EE	00]	
54EF	00	Null (terminator)

4. For the EPSON MX100 printer, locations of POLYNET.SYS must be changed as follows:

Memory Location	Old Value	New Value
5417	50	88
5418	84	E9
5419	28	44

This gives 136 normal characters per line, 231 compressed characters per line and 68 elongated characters per line.

5. These locations may also be PATCHed while still using the same printer. For example, when using 80 column wide paper on an EPSON MX100.

6. After patching POLYNET.SYS, it is necessary to reset the PROTEUS in order for the patches to take effect.

7. It is suggested that POLYNET.SYS be patched on master operating system disks so that these are standard for the particular system.

6. HARDWARE/SOFTWARE INTERFACES

6.1. SOFTWARE INTERRUPT FUNCTIONS

The number on the left-hand-side of each description below is the "Software Interrupt Function number". The BASIC function "SWI(number,parameter)" calls the relevant software interrupt function which is performed before the program continues. The PASCAL on POLY manual contains details of calling software interrupts for PASCAL programs.

For example:

To check the status of the keyboard, insert the code

```
X%=SWI(0)
```

at the appropriate position in your program.

Some software interrupt functions require one or more parameters to be specified. Values returned by software interrupts may be used as normal function values. Parameters and values returned are integers which occupy two bytes. Reference is sometimes made to the first (left-most) and second (right-most) bytes of these integers.

For example:

```
X%=SWI(3,1000,100)
Y%=SWI(1)
```

The first call does not return a value. The second returns a value which is assigned to the integer variable Y%.

Where a software interrupt function applies to a text screen, then it applies to the two teletext screens and screen 5 when used for the alternate character set.

0. Check Status of Keyboard.

This function checks to see if a key has been pressed on the keyboard.

Input Parameters: None
Value Returned:
If (SWI(0) AND 255) = 1 a character is waiting for the first time.
If (SWI(0) AND 255) = 128 the key is still depressed.
If (SWI(0) AND 255) = 129 a character is waiting for the first time and the key is still depressed.

1. Input Single Character.

This function turns on the cursor and waits until a character is typed on the keyboard (in either teletext or alternate character set mode).

Input Parameters: None
Value Returned:
The ASCII value of the key pressed (this is in the 2nd byte, the first byte remains unchanged). In BASIC, INCH$(0) accomplishes the same task.

2. Line Edit.

The line editor must first be initialised, otherwise it will not function properly. To do this first put the current text screen into ASCII mode by: ' PRINT"▮N"; '. Then call SWI 2 with the following parameters:

Input Parameters
Parameter 1:
Byte 1 - If zero then when the enter key is pressed (indicating End-Of-Line) the buffer is returned beginning from the start of the buffer to the cursor. If byte 1 is non-zero, then the buffer returned is from the start of the input buffer to the end of input buffer, no matter where the cursor is positioned.
Byte 2 - must contain 31 (hex $1F) to initialise the editor.
Parameter 2: The start address of user's input buffer.
Parameter 3: The maximum number of characters allowed (or the maximum buffer length).
Value Returned: None

The line editor is now ready to accept input characters in either teletext or alternate character set mode. The input character can be program generated or input from the keyboard using SWI (1). When a character is input the line editor will do the appropriate function e.g. insert character, delete character, cursor left or cursor right. When the enter key (13 or $0D) is input to the editor, the edit (or input)is complete, and the input buffer is copied into the user's buffer, whose address was specified in parameter 2 of the initialisation SWI call. The length of the buffer will be returned via parameter 3 (not accessible from BASIC).

An example in POLYBASIC is:

```
10 CLS
20 REM Ensure teletext screen is in ASCII mode
30 PRINT@(10,5)"▮N";
40 REM Buffer$ is the user's buffer
50 Buffer$=STRING$(20)
60 REM Ba% is the address of the user's buffer
70 Ba%=DPEEK(PTR(Buffer$))
80 REM Initialise editor to return whole
```

```
 90 REM buffer to address Ba%, and maximum
100 REM number of characters to input is 20.
110 Z%=SWI(2,256+31,Ba%,20)
120 REM Get a character from the keyboard
130 A%=SWI(1) AND 255
140 REM Input the character to the line editor
150 Z%=SWI(2,A%)
160 REM If the character wasn't ENTER then go back for another input
170 IF A%<>13 THEN 130
180 REM The key was ENTER, so now the input buffer has been
185 REM copied into the user's buffer.
190 CLS
200 REM Print the user's buffer which now contains the
205 REM edited line.
210 PRINT@(5,0) Buffer$
220 END
```

Note: INCH$(0) should not be used with this function.

3. Sound Generator.

This function generates sound from the speaker. the pitch is calculated as (502400 / frequency) -1. The length is specified in 10 millisecond lengths.

Input Parameters:
Parameter 1: The pitch of the sound.
Parameter 2: The length in 10 millisecond intervals.
Value Returned
None.

4. Pause

This function will cause a pause if the pause key has been pressed (and thus the pause flag is set).

Input Parameters: None
Value Returned:
The ASCII value of the key pressed (in the 2nd byte, the first byte remains unchanged) after the pause. Pressing the space bar or the pause key will not reset the pause flag, other keys will.

5. Put Character

This function prints a character to the current text screen.

Input Parameters:
Parameter 1: The second byte contains the character to be printed on the screen.
Value returned: None

6. Write Character to Specified Position

This function prints a character to a specified position of the current text screen. It does not affect cursor position.

Input Parameters:
Parameter 1: The second byte contains the byte to be printed.
Parameter 2: Not used.
Parameter 3: Contains the print position in teletext row, column format. E.g.,to specify row 2, column 3 use 2*256+3
Value Returned: None

7. Read the Keyboard

This function reads the keyboard. If a key has been pressed, it will return the ASCII character, otherwise a null (CHR$(0)) will be returned. This is essentially the same as INCH$ in BASIC.

Input Parameters: None
Value Returned: The second byte contains the ASCII value of the key pressed, otherwise null.
The first byte is unchanged.

8. Copy From Screen to a String

This function copies a string of characters from the current text screen to a memory area specified by the user. Nulls in the string will be converted to spaces (hex 20).

Input Parameters
Parameter 1: Start address of string (not above hex E000)
Parameter 2: Length of string to be copied.
Parameter 3: User specified position in row, column format
Value returned: None
If the user tries to copy beyond the end of the text screen the carry bit of the condition code will be set and the string is copied up to the end of the current text screen.

In the case of the teletext screens, the end of the screen is row 23, column 39. In the case of the alternate character set screen (screen 5) the end of the screen is defined by the alternate character set program (POLYACS.SYS). For the case of 60 character mode, this would be row 23, column 59.

9. Set Cursor Position

This function sets the cursor to a specified position on the current text screen. If the split screen is active then this function allows the user to move the cursor to the other portion of the split screen. If the input position is invalid then the cursor will not be moved (i.e. beyond the end of the text screen).

Input Parameters:
Parameter 1: Contains cursor position in row, column format. The first byte is the row, and the second byte the column (e.g. 2*256 + 5 sets the cursor to row 2 column 5).
Value Returned: None

If an invalid cursor format is specified then the carry bit of condition code is set on return.

10. Set Relative Cursor Position on Current Text Screen.

This function moves the cursor by the specified number of positions, relative to its current location.

Input Parameters:
Parameter 1: A positive or negative number which is the number of rows that the cursor is to be moved.
Positive is down, negative is up.
Parameter 2: A positive or negative number which is the number of columns that the cursor is moved.
Positive is to the right, negative is to the left.
Value Returned: None
If the resulting cursor position is outside the screen area the carry bit of the condition code is set and the cursor is not moved.

11. Read Cursor Position

This function reads the cursor position of the current text screen. It does not affect the cursor position.

Input Parameters: None
Value Returned:
The first byte contains the row and the second byte contains the column number of the cursor position.

12. Read Cursor Character

This function reads the character on the current text screen at the current cursor position.

Input Parameter: None
Value Returned:
The first byte is always null. The second byte contains the ASCII value of the character read.

13. Split Screen Into Two Portions

This function splits the current text screen into two portions, one above the other. The two portions are to all intents and purposes independent of each other, in particular, scrolling on one portion is independent of scrolling on the other, and the cursor remains in one portion until specifically moved to the other using PRINT@ or SWI(9) or SWI(10).

Input Parameters:
The first byte contains the start row of the second half of the split screen. (If =0 or >23 then the split screen is turned off i.e. reset.)
Value Returned: None

14. Clear Text Screen

This function is used to clear one of the text screens. Clearing the current text screen can be accomplished by printing a character 12 (Hex $0C, Home) to the screen using SWI(5).

```
Input parameters:
     Only the second byte is used.
     If >0 and <127      Clear screen 3
        =0               Clear screen 1
        >=128 and <=255 Clear current screen
Value Returned: None
```

If the alternate character set has been selected, this function will always clear the alternate character set screen (i.e. screen 5).

15. Set Screen and Display Characteristics.

This function is used to set teletext and graphics characteristics as follows (but note the alternate character screen must be specially set):

```
Input Parameters:
     Parameter 1: A 16 bit integer where each bit is
     set or reset according to the following functions.
     bit 15 - Not used
     bit 14 - Mix/priority bit: 1=mix, 0=priority
     bit 13 - 1=Display 2 (Graphics 1 screen)
     bit 12 - 1=Select 5, 0=Select 2
     bit 11 - 1=Display 1 (Teletext 1)
     bits 10 & 9 - Select screen 2 mix colour
00=blue, 01=green, 10=red,11=none
     bits 7 & 8 - Not used
     bits 6 5 & 4 - Select background colours
i.e.bit 6 - 1= BLUE
    bit 5 - 1= GREEN
    bit 4 - 1= RED
     bits 3 & 2 - Select screen 4 mix colour as for
 Screen 2 (see bits 10 and 9)
     bit 1 - 1=Display 4
     bit 0 - 1=Display 3
Value Returned: None.
```

16. Read Display Mode.

This function reads the current screen display mode.

```
Input Parameters: None
Value Returned:
     A 16-bit integer defined as follows:
     bit 15 - Not used
     bit 14 - Mix/priority bit: 1=Mix, 0=Priority
     bit 13 - 1=Display 2 (Graphics 1 screen)
     bit 12 - 1=Select 5, 0=Select 2
     bit 11 - 1=Display 1 (Teletext 1)
     bits 10 & 9 - Select screen 2 mix colour
00=blue, 01=green, 10=red,11=none
     bits 7 & 8 - Not used
```

bits 6 5 & 4 - Select background colours
i.e. bit 6 - 1= BLUE
bit 5 - 1= GREEN
bit 4 - 1= RED
bits 3 & 2 - Select screen 4 mix colour as for Screen 2 (see bits 10 and 9)
bit 1 - 1=Display 4
bit 0 - 1=Display 3

17. Set The Clock

This function allows the user to change the current value of the clock. The clock is initially programmed to interrupt every one second. The user can use this function to stop the clock or restart it. (Warning: sound generation is dependent on the clock - if the clock is turned off the sound will not work.)

Input Parameters:
Parameter 1: Only the second byte is used. If zero then stop the clock otherwise run the clock as specified by the user.
Parameter 2: The first byte contains the most significant byte of a 3 byte value of time (in 10 millisecond units) after midnight.
Parameter 3: Contains the least significant two bytes of a 3 byte value of time (in 10 millisecond units) after midnight.
Value Returned: None

18. Return The Time

This function returns the current time in 10 millisecond units. If the clock is not running the carry bit of condition code is set and nothing is returned.

Input Parameters: None
Value Returned:
Parameter 1: The least significant 2 bytes of a 3 byte value of time (in 10 millisecond units) after midnight.
Parameter 2: The second byte contains the most significant byte of a 3 byte value of time (in 10 millisecond units) after midnight.
(In BASIC only parameter 1 is returned.)

19. WAIT Routine

This function waits for a period of time specified by the user. It is done by sampling the clock until it reaches the specified time. Therefore the clock must be running otherwise the carry bit of condition code is set.

Input Parameters:
Parameter 1: A 16 bit value of time (in 10 millisecond units) to wait.
Value Returned: None

20. Set Pause Flag

The function may be used to set or clear the pause flag.

Input Parameters:
Parameter 1: If zero the pause flag will be cleared, if non-zero the pause flag will be set.
Value Returned: None

21. and 22. Reserved For System Use

23. Read Through The Serial Port

This function allows the user to read a string of characters through the optional RS232 port. Either all characters up to and including a specified character are read, or a specified number of characters are read and stored in a string in the user area. A time out will occur if no character is received for approximately one second. The user must allocate a buffer of sufficient size in which the characters are stored.

Input Parameters:
Parameter 1: If negative, the absolute value is the count of characters to be read. Otherwise, this is the ASCII value of the delimiter character denoting the end of the input string.
Parameter 2: The address of the memory location into which the characters are to be stored.
Value Returned: The number of characters actually input. If negative or zero a timeout has occurred (the absolute value represents the number of characters input before the timeout).

24. Write Through The Serial Port

This function allows the user to output a string of characters through the optional RS232 port. Either all characters up to and including a specified character are output or a specified number of characters are output from a string in the user area. A timeout will occur if the serial port is not ready for transmission for approximately one second.

Input Parameters:
Parameter 1: If negative, the absolute value is the count of characters to be output. Otherwise, this is the ASCII value of the delimiter character denoting the end of the output string.
Parameter 2: The address of the memory location from which characters are to be output.
Value Returned: The number of characters actually output. If negative or zero, a timeout has occurred (the absolute value represents the number of characters output before the timeout).

Note: When using the RS232 port it is necessary to
(i) initialise it (i.e. write 3 to memory location $E004),
(ii) set the baud rate (i.e. write an appropriate number to memory location $E006 - see Software Interrupt 25), and
(iii) set the word structure (i.e. write an appropriate number to memory location $E004 - see Software Interrupt 25).

For example:

```
 10 REM Master reset of I/O port
 20 Z%=SWI(47,3,HEX("E004"),0)
 30 REM Set Word Structure
 40 Z%=SWI(47,1,HEX("E004"),0)
 50 REM Set baud rate to 9600 bit/sec
 60 Z%=SWI(47,0,HEX("E006"),0)
 70 OPEN OLD "PRIMES.TXT" AS 1
 80 ON END #1 GOTO 180
 90 Z%=SWI(47,12,HEX("E005"),0)
100 INPUT LINE #1,Z$
110 REM Ouput the line
120 Z%=SWI(24,-LEN(Z$),DPEEK(PTR(Z$)))
130 REM Output a carriage return
140 Z%=SWI(47,13,HEX("E005"),0)
150 REM and a line feed
160 Z%=SWI(47,10,HEX("E005"),0)
170 GOTO 100
180 CLOSE 1
```

This program uses software interrupt 24 to output a complete file through the RS232 port, line by line.

For example:

```
 10 scratch% = SWI(47,3,HEX("E004"),0)
 20 scratch% = SWI(47,0,HEX("E006"),0)
 30 scratch% = SWI(47,17,HEX("E004"),0)
 40 buffer$ = STRING$(255)
 50 bufpnt% = DPEEK(PTR(buffer$))
 60 ret% = SWI(23,13,bufpnt%)
 70 IF ret%<=0 THEN 130
 80 ret% = SWI(24,-ret%,bufpnt%)
 90 IF ret%<=0 THEN 130
100 ret%=SWI(47,13,HEX("E005"),0)
110 ret%=SWI(47,10,HEX("E005"),0)
120 GOTO 60
130 PRINT"TIMED OUT"
140 STOP
```

This program will read characters through the RS232 port until a carriage return is encountered. The string is then echoed out the RS232 port (using the character count). The initialisation in lines 10,20,30 sets the port up for 9600 baud, with a word consisting of 8 bits and 2 stop bits.

25. Select Terminal Mode

This function allows the POLY to act as a dumb terminal. Characters input via the keyboard are transmitted through the serial port. Characters received at the serial port are displayed on the screen. Reset must be used to restore the POLY to normal operation.

Input Parameters:

Parameter 1: A number corresponding to the baud rate as follows:

0 = 9600
2 = 4800
4 = 2400
6 = 1200
8 = 600
10 = 300
12 = External Clock (Cassette Interface)

Parameter 2: The word structure (i.e. word size, parity on/off). The bits specifying this are 000xxx01 so this will be a number between 1 and 29 as follows:

1 = 7 bits + even parity + 2 stop bits
5 = 7 bits + odd parity + 2 stop bits
9 = 7 bits + even parity + 1 stop bit
13 = 7 bits + odd parity + 1 stop bit
17 = 8 bits + no parity + 2 stop bits
21 = 8 bits + no parity + 1 stop bit
25 = 8 bits + even parity + 1 stop bit
29 = 8 bits + odd parity + 1 stop bit

Value Returned: None.

26. Select Standard Memory Map 2

This function selects the predefined memory map 2. This map contains the 64k RAM addresses from $0000 - $FFFF. The two graphics screens are also included in this memory map. The address of the first graphics screen occupies $E000 - $FFFF, the second graphics screen occupies $8000 - $9FFF. The operating system occupies $C000 - $DFFF. To display the graphics screen see SWI(15) and SWI(16).

Input Parameters: None.
Value Returned: None.

27. Switch To Memory Map 1

This function allows the user to switch from memory map 2 to memory map 1. If the user is already in map 1 nothing will change. The only difference between memory map 1 and standard memory map 2 is that in map 1 addresses from $A000 - $BFFF and $E000 - $FFFF are the 16k BASIC ROMs while in map 2 these addresses are 16k of RAM.

Input Parameters: None
Value Returned: None

28. Switch To Memory Map 2

This function allows the user to switch from memory map 1 to memory map 2 (non standard). It is usually called after SWI(29) which changes the configuration of map 2 but does not switch to it.

Input Parameters: None
Value Returned: None

29. Change Configuration of Memory Map 2

This function uses the user specified address translation table to configure memory map 2. The address translation table is written into the system dynamic address translator (DAT). This configuration does not change until the next call to this function or until the system is reset. In the latter case the configuration is the same as standard memory map 2. (Note: the BASIC interpreter uses a different configuration from the standard map 2, therefore one cannot assume that memory map 2 is always the same as the predefined memory map 2.) This function does not switch the current memory map to memory map 2, to do this use SWI(28). A copy of the current contents of memory map 2 is held in memory locations DFF8-DFFF.

Input Parameters:
Address of the 8 byte translation table.
Value Returned: None

30. Select Current Text Screen

This function selects one of the two teletext screens or the alternate character-set screen. Once it is selected, all references to a text screen (e.g. print a character, read a character etc.) will refer to this screen. One of the screens will be current at any one time. This function only selects the current text screen, it does not display it. (See SWI(15) and SWI(16) to display teletext and graphics screens.)

Input Parameter:
If the second byte contains 2 or 3, the second teletext screen (Screen 3) is selected.
If the second byte contains 5 and the alternate character set software has been loaded, then the alternate character set screen (screen 5) is selected. Otherwise the first teletext screen (screen 1) is selected.
Value Returned: None.

31. Select 24-Line Display for Teletext Screens.

Calling this function sets both teletext screens to display 24 lines.

Input Parameters:
None.
Value Returned:
None.

32. Select 12-Line Display for Teletext Screens.

Calling this function sets both teletext screens to display 12 lines.
Functions 33 & 34 determine whether the top 12, or bottom 12 lines are to be displayed.

Input Parameters:
None.
Value Returned:
None.

33. Display First 12 Lines.

When used in conjunction with 32 above, this function displays the top 12 lines (lines 0-11) on each teletext screen.

Input Parameters:
None.
Value Returned:
None.

34. Display Last 12 Lines.

When used in conjunction with 32 above, this function displays the bottom 12 lines (lines 12-23) on each teletext screen.

Input Parameters:
None.
Value Returned:
None.

35. Set Scroll Mode On Text Screen

The text screens can operate under scroll mode or wrap mode. In scroll mode, when the cursor reaches the end of the screen, the whole screen is scrolled up one line and the cursor is positioned at the start of the bottom line. In wrap mode, the cursor wraps around to the top of the screen, and there is no scrolling.

Input Parameters:
If the second byte is zero, the text screens are set to scroll mode. Otherwise the text screens are set to wrap mode.
Value Returned: None

36. Map In Memory Page

This function allows a specified physical 8K page of memory (RAM or ROM) to be addressed from a specified 8K logical page in Memory Map 2. See section 6.2 for a description of the contents of physical memory pages. This function does

not alter the configuration of Memory Map 1.

WARNING: unpredictable results may occur if this function is called from BASIC.

Input Paramater:
The first byte: logical page number in 6809 address space (0 to 7)
Second byte: The page number (0 to 15) of the physical page to be mapped in to the above logical page.

Value Returned: None

37. Test EXIT Flag

This function returns the exit key flag. If the exit key has been pressed the value returned is non zero. On return the exit key flag is always cleared to null.

Input Parameters: None.
Value Returned:
The first byte is unchanged. The second byte contains the exit key flag. If non zero, the exit key has been pressed.

38. to 42. Reserved For System Use

43. Send Message to Master

This function is used to send a message to the network controller. There should be no need for a user to call this function, as all message handling is done by the operating system.

Input Parameters:
Parameter 1: The second byte contains the message type.
Parameter 2: Start address of message.
Parameter 3: Length of message.
Value Returned: None.
The carry bit of the condition code is set if an error occurs in the communication system.

44. Receive A Message From Master

This function is used to receive a message from the network controller. Normally the master does not send messages to the POLY unit unless the POLY has requested some information from the master.(e.g. read a sector from disk). As in the case of SWI(43) the user should not need to call this function. The user must provide a buffer of sufficient length to receive the message.

Input Parameters:
Parameter 1: Not used.
Parameter 2: Start address of message to be received.
Parameter 3: Maximum length of message allowed.

Values Returned:

Parameter 1: The second byte contains the message type.
Parameter 2: Not changed.
Parameter 3: Length of message actually received.

If there is a communication system error or no message is forthcoming, then an error has occured and the carry bit of the condition code is set.

45. Log Off

This function returns the user to the start up screen.

Input Parameters: None.
Value Returned: None.

46. Read System Input/Output

This function allows the user to read the status and data registers of various peripherals attached to the POLY.

Because all input/output ports appear only in the system memory map mode (which is protected), it is necessary to use this function to read these ports e.g. PIA, TIMER.

Input Parameters:

Parameter 1: If the second byte is zero then one byte is read, otherwise 2 bytes are read.
Parameter 2: Address to read from.

Value Returned:

The value read. If only one byte is read, then it will be in the low order byte and the high order byte will be unchanged.

47. Write System Input/Output

This function allows the user to write to the control and data registers of various peripherals attached to the POLY.

Input Parameters:

Parameter 1: The 1 or 2 bytes of data to be written to the specified address. If only one byte is to be written, the low-order byte must contain the data.
Parameter 2: Address to write to.
Parameter 3: Zero indicates one byte is to be written, otherwise 2 bytes will be written.

Value Returned: None.

6.2. MEMORY MAPPING

The 6809 micro-processor is capable of addressing 64K bytes of memory. However a feature called Dynamic Address Translation has been incorporated into the POLY which allows more than 64K to be used.

This feature allows the user to switch into addressable memory any of 8 blocks of 8K memory, from a maximum of 16 blocks. These may be placed in any order in any of the 8 positions in addressable memory. Two memory maps are available, and the user indicates which is currently in use.

Memory map 1 is fixed at initialisation of the system, but the user may alter memory map 2 to suit an application by using software interrupt 29 or 36. The selection of a memory map is made using software interrupts 27 and 28.

The physical memory in the POLY is allocated as follows

Blocks 8 to 15	64K RAM
Blocks 6 and 7	16K BASIC ROM
Blocks 4 and 5	16K RAM bank 3 Block 4 contains screen 4
Blocks 2 and 3	16K RAM bank 2 Block 2 contains screen 2
Blocks 0 and 1	16K RAM bank 1

The System ROM and Teletext screens are within a protected area which is not accessable directly by the user. These may only be accessed by software interrupts.

Standard memory maps 1 and 2 are configured as follows

MAP 1

Starting address	Physical block	Contents
$E000	7	BASIC ROM
$C000	5	DOS RAM
$A000	6	BASIC ROM
$8000	4	Screen 4 or user RAM
$6000	8	User RAM
$4000	3	User RAM
$2000	1	User RAM
$0000	0	RAM BASIC (up to $1B00)

MAP 2

Starting address	Physical block	Contents
$E000	2	Screen 2 or user RAM
$C000	5	RAM DOS
$A000	9	User RAM
$8000	4	Screen 4 or user RAM
$6000	8	User RAM
$4000	3	User RAM
$2000	1	User RAM
$0000	0	User RAM

To setup and call a special memory map 2, carry out the following steps.

1. Set up a string of 8 bytes, each byte containing the physical block number to be put into the map, starting from address 0.

2. Call software interrupt 29 giving the address of the 8 bytes as parameter 1.

3. Call software interrupt 28 to select memory map 2.

For example:

In BASIC

```
100 A$=CHR$(0)+CHR$(1)+CHR$(3)+CHR$(8)+CHR$(2)+CHR$(6)+
CHR$(5)+CHR$(7)
110 A%=SWI(29,DPEEK(PTR(A$)))
120 A%=SWI(28)
```

this puts screen 2 in place of screen 4 in addressable memory.

BASIC graphics commands should not be used while using memory map 2, as these use a special memory map 2 and will overwrite the memory map defined by the user.

Memory locations $DFF8 to $DFFF contain the current configuration of Memory Map 2 (see figure 6.1). If this map is changed by the use of software interrupts 29 or 36, these locations are changed correspondingly. They may be saved to allow the original memory map to be restored, but they should not be altered directly by the user.

Memory location $DFF7 contains 0 if Memory Map 1 is selected and 2 if Memory Map 2 is selected. This location should also not be altered directly by the user.

Contents of	= Block number mapped into
$DFF8	$0000 - $1FFF
$DFF9	$0002 - $3FFF
$DFFA	$0004 - $5FFF
$DFFB	$0006 - $7FFF
$DFFC	$0008 - $9FFF
$DFFD	$000A - $BFFF
$DFFE	$000C - $DFFF
$DFFF	$000E - $FFFF

Figure 6.1 Map 2 Image

6.3. CASSETTE INTERFACE

An optional cassette interface may be attached to the POLY2 (provided an RS232 port is also present). Cassette interfaces are generally sensitive to the type of recorder used and should be adjusted during installation.

The cassette interface utilises the serial RS232 port and thus software interrupts 23, 24, 46 and 47 may be used to record to and load from tape.

The RS232 baud rate should be initialised to 1200 bits/second (see Software Interrupt 25) for output. For input the baud rate should either be set to 1200 bits/second, or, to increase the tolerence to tape speed errors initialise the port with value 12 so the clock is derived from the signal on the tape.

Below is a listing of a program which generates a character pattern on tape. Start the cassette recorder on record and RUN the program. After some time, EXIT from the program and enter

```
A%=SWI(25,12,17)
```

to put the POLY into terminal mode (with the external clock). Rewind the tape and play it, the pattern will be displayed on the POLY. Faulty adjustment or faulty cassette performance will be readily visible.

```
10 A%=SWI(47,3,HEX("E004"),0)
20 A%=SWI(47,6,HEX("E006"),0)
30 A%=SWI(47,17,HEX("E004"),0)
40 FOR I%=32 TO 127
50 BUF$=CHR$(14)+CHR$(13)+CHR$(10)+CHR$(15)+CHR$((I%AND7)+1)+STRING$(38,I%)
60 BP%=DPEEK(PTR(BUF$))
70 FOR J%=1 TO LEN(BUF$)
80 A%=SWI(46,0,HEX("E004"),0)
90 IF A%AND2 THEN A%=SWI(47,ASC(MID$(BUF$,J%,1),HEX("E005"),0) ELSE GOTO 80
100 NEXT
110 NEXT
120 GOTO 40
```