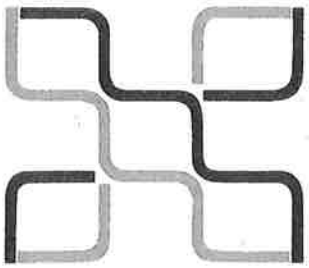
POLY SYSTEM OPERATING MANUAL



polycorp

POLY SYSTEM OPERATING MANUAL

VERSION 2.3

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POLYCORP

New Zealand Limited

The material presented in this document has been expressly prepared by POLYCORP New Zealand Limited.

Progeni House, 14/18 Pretoria Street
Telephone (04) 693-302, P.O. Box 30-243, Lower Hutt
Telex PO LHT NZ3740 Attn Progeni

CONTENTS

1. HARDWARE DESCRIPTION

1.1. HARDWARE UNITS

A POLY system has the following units:

i) Network Control Unit (POLY DRIVE or PROTEUS)

ii) Printer

iii) One or more POLY units

1.1.1. Network Control Unit (POLY DRIVE or PROTEUS)

This unit controls the POLY system and houses the floppy disk facility.

All POLY units link to the Network Control Unit via a communications cable.

The printer connects directly to the Network Control Unit. The function of the disk is to provide, for all POLY units, access to a single disk storage system and to a printer.

Requests for disk access (both read and write) are queued by the Network Control Unit. Processing of the queue is designed to provide an even distribution of service time to all requests currently on the queue.

The Network Control Unit also automatically controls and records the status of the network system.

Specifically, POLY units may be added or removed from the system without the system being powered down. This enables faulty units to be removed from the system without affecting the remainder of the system.

The single drive Network Control Unit houses one eight inch floppy disk, labelled 0. The dual drive Network Control Unit houses 2 eight inch floppy disks labelled 0 and 1.

On the door catch of each drive, there is a small red light. Whenever information transfer is being carried out, the light on the door catch of the appropriate disk drive glows.

No attempt to remove a disk should be made when one of these lights is glowing.

Control of the disk unit is limited to:

i) An ON/OFF switch

The ON/OFF switch is located on the rear panel of the unit. A neon lamp indicates when the power is switched on.

ii) Insertion/removal of the subject disk from drive 0 or 1

The manipulation of the disk units is covered in detail later in this section.

iii) A reset button

The reset button is located on the rear panel to the right of the network socket.

Several external connections are permitted to the disk unit. These are:

i) 230v Power Source

Connection of the 230v power source is via the attached cable and plug.

An ON/OFF switch on the rear panel controls the power supply. When the power is switched on, a neon lamp glows. This lamp is located next to the power switch. A power fuse is removed by unscrewing the plastic cover and withdrawing the fuse.

ii) Communications Link

Connection of the network cord is standard in that all POLY units have an identical facility. The connector is circular and has a locking key to prevent accidental withdrawal and incorrect orientation.

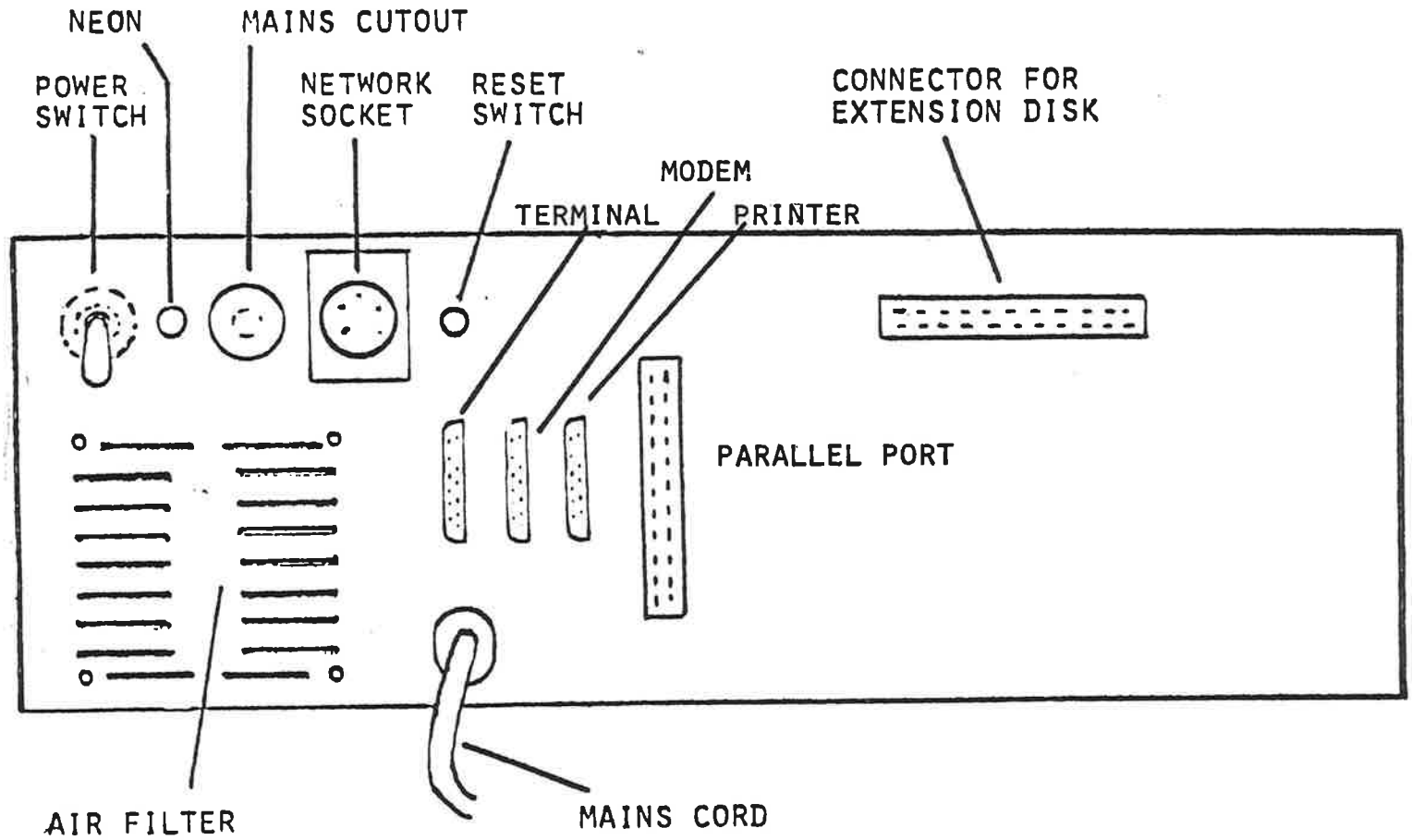
The first computer in the system must connect to the disk unit.

iii) Printer Port

Connection of the Printer is via a ribbon cable and oval shaped, multi-pin connector. The connector is a push fit and the shape excludes any possibility of incorrect orientation. The port is labelled PRINTER.

iv) Other Peripheral Ports

These are labelled TERMINAL, MODEM, PARALLEL and EXTENSION. The terminal port is for connection to a terminal when the network control unit may be used as a PROTEUS microcomputer. The modem port is for connection to other computers. The parallel port provides an interface to other peripheral devices. The extension port is for connection to an extension disk drive. These are described in more detail in the PROTEUS Computer User Manual.



PROTEUS - POLY NETWORK CONTROL UNIT (BACK)

1.1.2. Printer

A single printer is shared by the system under the control of the disk unit.

The printer links to the disk unit via a flat ribbon cable and an oval connector.

A range of printers may be connected directly to the system. For the printer supplied, a separate manual is provided and covers:

i) paper threading instructions,

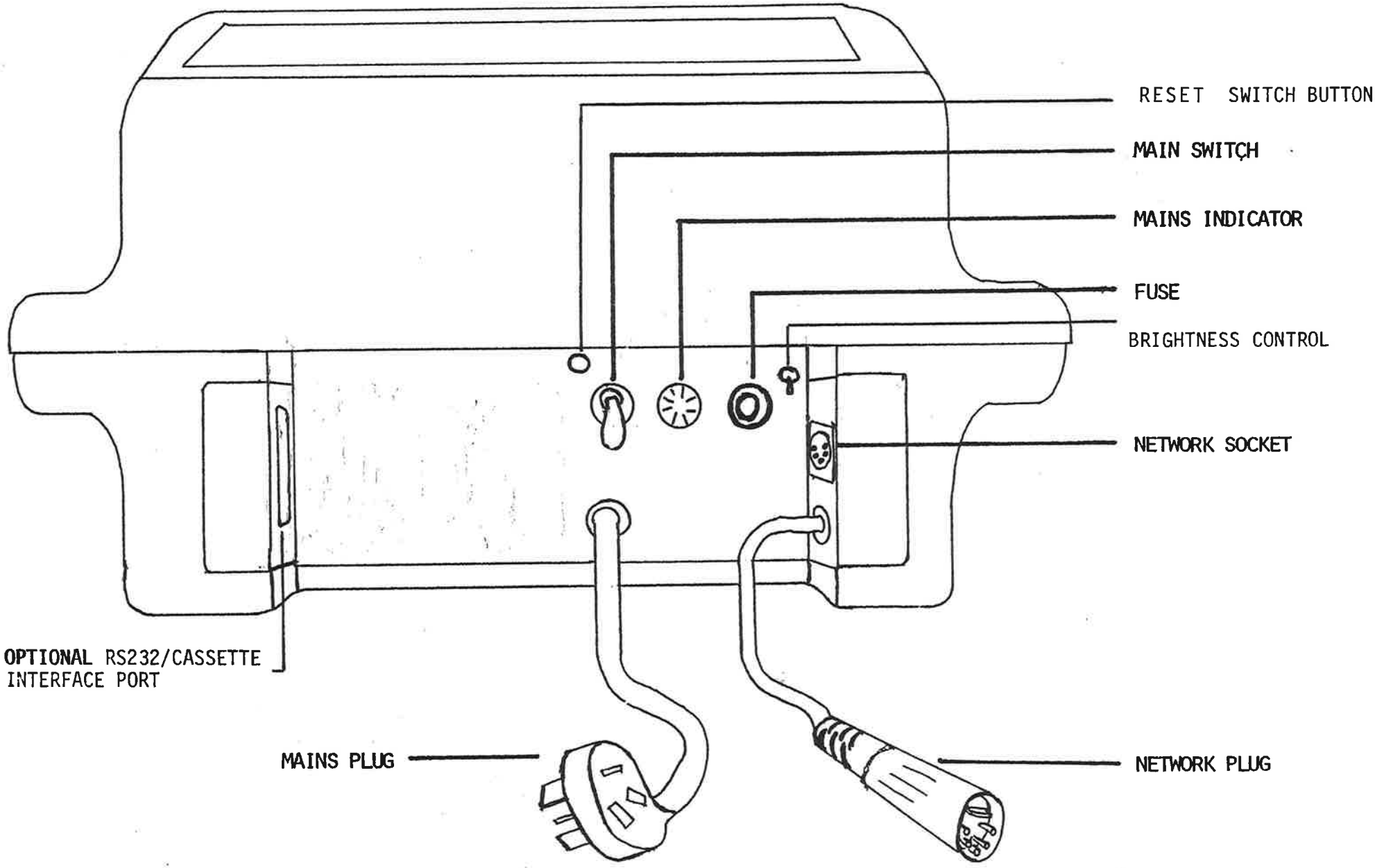
ii) instructions for changing the ribbon,

iii) the printer functions,

iv) power connection, power switch and fuse facilities, and

v) internal switch settings.

Any printer attached to a PROTEUS running the POLY Operating System should be set so that a carriage return does not automatically produce a line feed. With some printers it will be necessary to patch POLYNET (the part of the POLY Operating System controlling printing) to cater for width of page, length of page, elongated characters, compressed characters, serial or parallel port, etc since these differ with different makes of printers.



POLY1 COMPUTER (BACK)

1.1.3. The Poly Units

Each POLY unit consists of a colour screen and keyboard enclosed in a single case.

The POLY may be operated on its own (Standalone Mode) or, more usually, as part of a network centred on a Network Control Unit (PROTEUS).

Interfacing with peripheral units such as printers and disk storage devices is generally achieved via the disk control unit.

The screen offers full colour together with text, high resolution graphics and mixed text and graphics, as a means of material presentation.

The keyboard is a standard QWERTY keyboard together with a range of special purpose keys (see diagram). The special keys are as follows:

ENTER — Either of these keys must be used to terminate any line of input.

EXIT BACK — Depressing the EXIT key, using the SHIFT, terminates the current operation. The EXIT key may be software defined e.g. to return to a menu screen.

Depressing the BACK key without SHIFT enables the user to return to a previous screen display, as defined by the software.

REPEAT NEXT — Next is used with the SHIFT and enables the user to go forward to the next screen display, as defined by the software.

Repeat is used without SHIFT to repeat the current screen exercise, as defined by the software.

PAUSE — Using this key causes the program currently executing to be suspended. The program may be restarted by pressing any key. PAUSE may be disabled by the software.

SHIFT — Keys which carry double captions require the use of this key to activate the "upper" caption. The SHIFT key must be held down while the key with the required upper caption is depressed.

CAPS LOCK — This key locks when pressed, but will be released when pressed again. When depressed all alphabetic characters will appear in upper case.

ARROW KEYS — These four keys have two functions:

i) Movement of the cursor e.g. on MENU displays.

ii) Some user programs permit entry of text. The use of these keys permits the positioning of the cursor to correct the text. When programming in POLYBASIC, or when making any input in response to an input prompt, the left and right arrow keys permit corrections to be made.

EDIT KEYS These keys are used for editing either text or program source code.

Line INS Char / Line DEL Char — Line Insert and Delete are used with the SHIFT key. Character Insert and Delete are used without the SHIFT key. These keys may be used when editing.

CALC — Depressing the CALC key using the SHIFT makes the POLY function as a calculator. When depressed, the user program is interrupted and the bottom line of the screen cleared to permit entry of the calculation. Once the calculation is completed, pressing the CALC key again will restore the screen and continue with the program. CALC may be disabled by the software.

HELP — Depressing the HELP key will produce expanded error explanations. It may be software defined to provide useful information (as with menus).

The POLY unit has all external connections located on the rear panel. These are:

i) 230v Power Source

Connection of the 230v power source is via the attached cable and plug. An ON/OFF switch on the rear panel controls the power supply. When the power is switched on, a neon lamp glows. This lamp is located next to the power switch. A power fuse is located on the rear panel. The fuse is removed by unscrewing the plastic cover and withdrawing the fuse.

ii) Communications Link

Connection of the network is via a circular connector.

Accidental withdrawal and incorrect orientation are controlled by a catch on the plug and socket.


PAUSE
ENTER
EXP
CAPS LOCK
SHIFT
SHIFT
LINE INS CHAR
LINE DEL CHAR
CALC HELP
EXIT BACK
REPEAT NEXT
ENTER

iii) Optional RS232 Port

Standard POLY units may be field upgraded to support an RS232 serial port to which many peripherals may be directly attached. The connectors for the port are the same as those for the printer on the PROTEUS. The RS232 port may be further upgraded to act as a cassette interface port (a special cable is required).

1.2. THE NETWORK

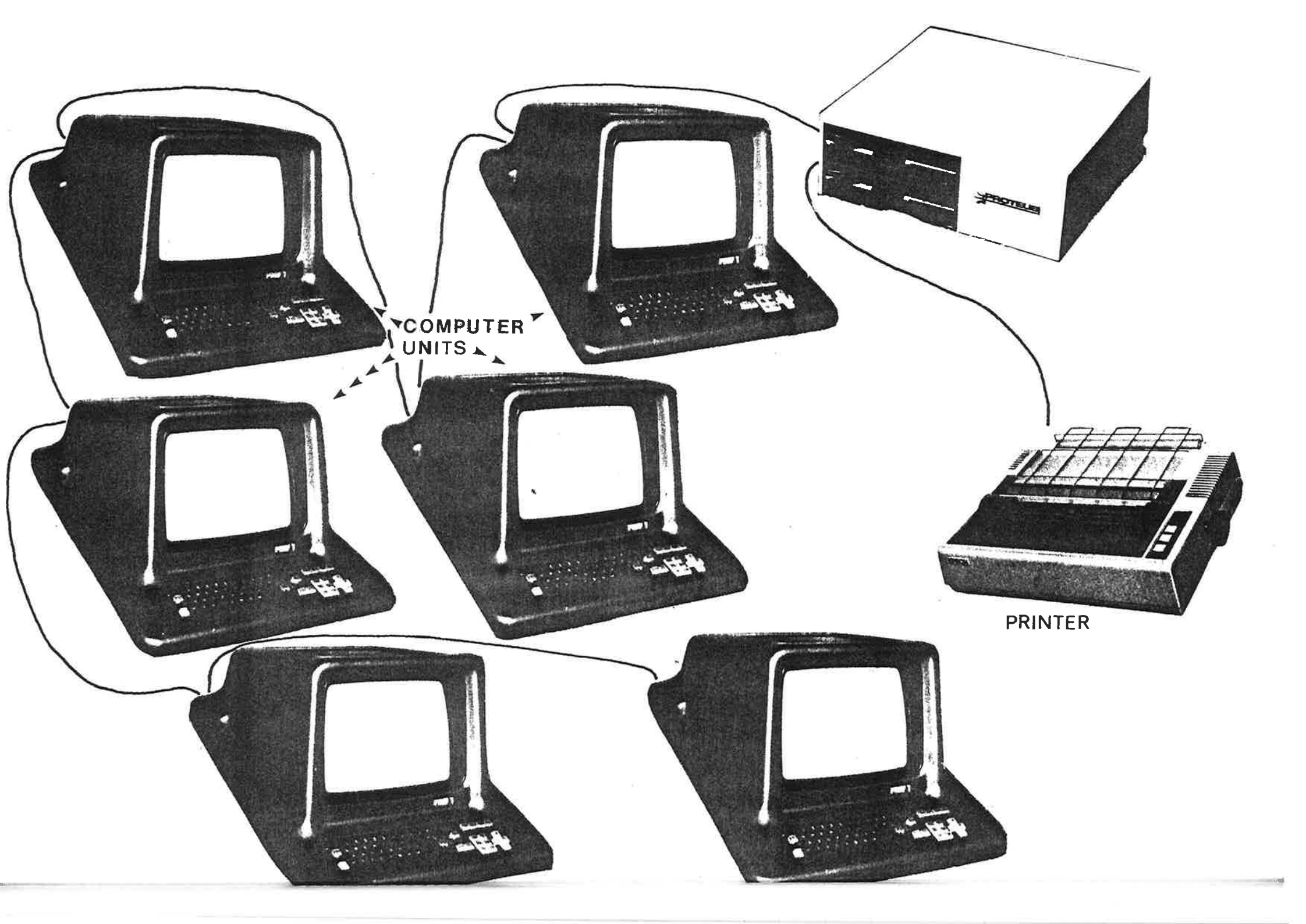
* The POLY system is designed so that the computer units all share a network control unit and a printer. To enable this, all POLY units must link to the network control unit. This linking is achieved by linking from POLY unit to POLY unit to form a daisy chain or network. Only the first POLY links to the network control unit.

* POLY units may be added to or removed from the network at any time. To carry out the removal or addition, the chain must temporarily be broken. Each POLY has a cord terminated by a plug, which plugs into a socket in the previous POLY on the chain.

* Each POLY has a socket which accepts the link from the next POLY in the chain. The link cord and plug is permanently attached to the POLY.

* Requests for information from the disk are controlled by the network control unit. Requests for use of the printer are satisfied by storing a copy of the printed output on disk (i.e. the material is spooled). The information is then printed from the disk by the Network Control Unit.

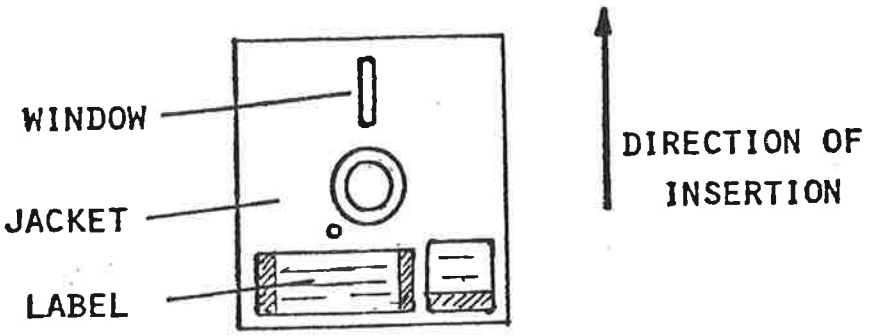
* The network is controlled by the Network Control Unit. The control begins when the disk unit is switched on and a disk containing the operating system is inserted into drive 0. The system requests details of the date and the time from the first POLY to start up. The information is entered as part of the START UP procedure (see Chapter 3).


COMPUTER
UNITS
PRINTER

1.3. USE OF DISKS

* The disks used by the system are eight inch, double sided, single density.

* Each floppy disk is enclosed in a special paper jacket. Access to the recording surface is via a cutout window in the jacket.



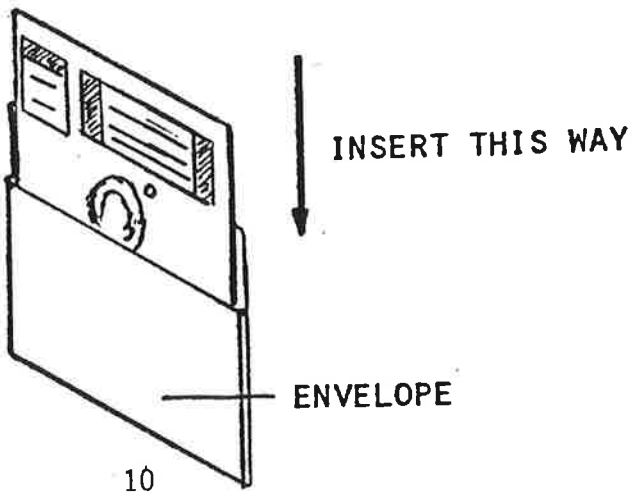
* To rotate the disk within the jacket, access to the centre of the disk is provided by a central, circular cutout in the jacket.

* A small cutout offset from the central cutout provides timing information.

* All cutouts on one side of the jacket, have corresponding cutouts on the reverse side.

* Some types of disk have a notch on the edge facing the direction of insertion. Special sticky tags are provided to cover this notch. When covered, the disk may be written to and read from. When uncovered, the disk may only be read from.

When using the disks, never touch the exposed recording material with fingers and avoid any dust settling on the surface. In particular keep the disk in the supplied paper envelope, inserting the disk into the envelope so that the oval cutout enters first (see diagram) and the label faces "outwards".



The label on the disk jacket:

i) provides identification of the disk,

ii) provides assistance in the orientation of the disk for insertion into the drive.

NEVER write on this label with ballpoint pen or pencil as this will damage the disk surface.

To mark the label use felt pen.

1.3.1. Using the Disk Drives

1. Ensure that the red light on the front of the drive is extinguished (if the system is already in use, ensure that no one on the system is using the currently loaded disk).

   The red light on the front of the drive comes on whenever disk activity is taking place. If for some reason, the red light will not extinguish, hold the reset button in for approximately five seconds until the light extinguishes, then open the door with the reset button held in.

2. On releasing the latch, any disk currently inserted will be ejected outwards (place the disk in its paper envelope and put carefully away before proceeding further).

3. Remove the required disk from its envelope.

4. With the label uppermost and the oval cutout facing the disk slot, gently insert the disk into the drive.

   The disk is fully inserted when:

   i) none of the disk jacket is exposed, and

   ii) gentle resistance is felt to the insertion process.

   NEVER force a disk into a drive. If undue resistance is felt draw the disk out and start again.

5. Now close the drive by moving the latch downwards.

2. SETTING UP THE SYSTEM

2.1. GENERAL POINTS

When setting up the system, the following general points should be considered:

* Furniture within the room will be required by the systems as follows:

    1 desk/POLY unit
    1 desk for the disk unit
    1 desk for the printer

* The furniture must be positioned to allow for:

i) Access to 230v power sources.

ii) Linking of POLY's via the network cable. (Most cables are 2m long).

iii) Pupil participation, especially where more than one pupil per machine is required.

iv) Classroom usage other than that involving the microcomputer.

v) Room lighting - avoid direct sunlight falling across the screen.

vi) Position of cords and cables. Any cords which cross a walkway must be taped to the floor with wide masking tape or be run up and over the walkway in the form of an "arch" using tape to hold the cords in place.

* The network control unit must be placed in the most dust free position in the room. In particular keep the control unit well away from blackboards and associated chalk dust.

2.2. SETUP STEPS

To set up the system:

1. Position furniture.

2. Place all units as required.

3. Link the first POLY to the disk unit.

4. Link each POLY to the "one before it" in the network.

5. Connect the printer to the disk unit.

6. Connect all units to a 230v power source. Use distribution boxes (power boards) and extension cords, if necessary.

   NOTE: a system of ten POLY's will run from a single 230v 10 amp outlet.

7. Ensure that all cables are placed to prevent snagging - use tape to attach cables to floor, etc.

3. TURN ON PROCEDURE

The steps outlined in this section give a suggested "standard approach". Minor variations can be introduced without damage to the system. It is strongly recommended that the steps given be followed.

3.1. PROCEDURE

To turn ON the system:

1. Ensure that all network cables are correctly linked.
2. Ensure that all units are connected to a 230v supply.
3. Ensure that there is paper in the printer.
4. Ensure that all units are switched off (check the switch at the rear of each unit).
5. Turn on the 230v wall outlet supplies.
6. Turn on each computer - the magenta start up screen will appear.
7. Turn on the printer.
8. Turn on the switch on the rear panel of the disk unit.
9. Insert a disk (it must contain the POLY Operating System) in drive 0, making sure that the side with the label faces up.
10. Close the drive door.
11. When drive 0 disk activity ceases, any of the POLYs on the network may be "booted up" by pressing any key.
12. The first POLY started up will request the date and time to be entered:
    i) Enter the date in the form DD, MM, YY (commas optional).
    ii) Enter the time in the form HH, MM (comma optional).
13. Other POLY units started up will indicate "AWAITING LOAD" while the date and time has been entered on the first POLY started up.

14. The POLY operating system, BASIC and a program called LOGON.BAC (a compiled BASIC program) will be loaded into each POLY. While this is happening the message "SYSTEM LOADING NOW" will appear on the POLY unit screens.

15. LOGON.BAC will then be executed on each POLY.

16. Should the POLY operating system, BASIC or a program called LOGON.BAC not be present on the disk in drive 0, an error message will be displayed and the magenta start up screen will reappear.

3.2. LOGON

LOGON is a BASIC program that is automatically executed when a POLY is started up on the network. The standard LOGON procedure is as follows:

1. Type your initials and press the ENTER key. Note that typing something and pressing ENTER is referred to as entering something.

2. Enter a password of your own choice (preferably some sequence of letters that you will remember). The password will not be displayed on the screen.

3. LOGON will then chain (i.e. pass control) to a program callen MENU.BAC (a compiled BASIC program).

Note that your initials and password may consist only of alphabetic characters. Your name and password may be used at a later stage to password protect your files by using the PROT utility described in the POLYSYS Utilities Manual. To access a password protected file (for reading, updating, executing or unprotecting), the user must log on with the same initials and password used when the file was protected. If a user forgets the password used to protect a file, a special program called OVERRIDE is supplied to enable access to ALL files, whatever password was used to protect them. This program should be available only to the person in charge of the system.

If a user is not going to be accessing password-protected files, then log on may be accomplished by pressing ENTER twice, and not entering the initials or password.

If a more or less complex security system is required, the standard LOGON may be replaced accordingly. For example, it may be required that only valid users be permitted to log on to the system. In this case a special LOGON program would be written to accept the users name and password and check a master file previously set up with valid users and passwords.

3.3. MENU

MENU is a BASIC program that is chained to by LOGON after successful completion of the log on procedure. If no such program is on the disk in drive 0, BASIC mode will be entered. Most courseware is supplied with a menu program pertinent to the courseware on the disk. In addition, users may generate their own menus using POLYMENU (described separately).

The standard menu displays the appropriate menu options (seven per page or screen) as titles with adjacent boxes. In one of the boxes a flashing cursor will appear.

Special keys provide functions as follows:

i) HELP - a description of the module at the current cursor position will be displayed. Pressing HELP again will describe the MENU program operation.

ii) NEXT - the next page of modules on the menu will be displayed.

iii) BACK - the previous page of modules on the menu will be displayed.

iv) EXIT - will exit the menu program and normally log the user off.

v) Up and Down Arrows - used to move the cursor up and down the boxes of the displayed menu options.

vi) ENTER - used to select the option at the current cursor position.

As well, the menu program provides for:

i) Entering POLY BASIC programming mode.

ii) Entering POLY Text Editor mode.

iii) Entering DOS (Disk Operating System) mode.

iv) BROADCASTing.

v) Setting the default drive (so that the system may operate from drives other than 0).

vi) Changing menus (for example, when the disk is changed).

3.4. BROADCAST

Broadcast may be used to simultaneously load all POLY's in a network with the POLY operating system, BASIC, and a program (compiled BASIC) to be executed. As well, program and data files may be broadcast to the RAMdisk of each POLY in the network, thus facilitating efficiency of use for the user.

As mentioned above, the Broadcast facility is available from the standard POLY menu. Broadcast will only operate from the firdt POLY in a network (normally an instructor's POLY, to prevent unauthorised broadcasts). When a Broadcast is initiated, all POLY's in the network will be logged off automatically, so it is necessary to ensure that all users in the network are ready for a Broadcast.

To operate Broadcast, carry out the following steps:

1. Follow the turn on procedure (section 3.1, steps 1 to 10).

2. When drive 0 disk activity ceases, start up the POLY immediately linked to the disk drive by pressing any key.

3. This POLY will then request the date and time to be entered, as for step 12 of the turn on procedure.

4. The POLY operating system, BASIC, and LOGON.BAC will be loaded into the POLY.

5. LOGON.BAC will then be executed in the first POLY and the user should log on using the standard log on procedure (section 3.2, steps 1 to 3).

6. MENU.BAC will then be executed on the first POLY. One of the options provided by standard menu programs is the BROADCAST option. Select this option (press HELP from the MENU screen to obtain instructions for the exact procedure).

7. The word "BROADCAST" will be displayed at the bottom left of the screen, and the menu re-displayed. The particular module to be Broadcast may be selected from the menu of the first POLY in the network by the standard method.

8. All POLY's in the network will be logged off and the message "BROADCAST PROGRAM LOADING" will be displayed. The POLY operating system, BASIC and the selected program will be loaded into each POLY simultaneously. Following load, the message "BROADCAST PROGRAM LOADED" will be displayed.

9. The selected module will then be executed on each POLY.

4. TURN OFF PROCEDURE

The steps outlined in this section give a suggested "standard" approach. Minor variations can be introduced without damage to the system. It is strongly recommended that the steps given should be followed.

4.1. PROCEDURE

To turn the system off:

1. Ensure that all users on the system have finished what they were doing and logged off.

2. When all units show either a startup screen, a LOG ON screen or a menu, open the door of the disk drive by pushing the door release bar.

3. Remove the disks from the drives and carefully put them away.

4. Turn OFF the disk unit.

5. Turn OFF each POLY unit.

6. Turn OFF the printer.

7. Turn OFF the 230v wall outlet supply.

5. FAULT ANALYSIS AND REPORTING

5.1. GENERAL DESCRIPTION OF FAULTS

There are three levels of faults. These are:

i) faults, both mechanical and electronic, with one or more units (hardware or network faults),

ii) faults of a processing or a presentation nature which arise from errors in the supplied software,

iii) external faults such as power failure to the system.

In cases (i) and (ii) corrective action is required.

The description of the faults and the corresponding corrective action described in this section may involve turning the system either OFF or ON. Where these procedures occur, the appropriate turn OFF and turn ON procedures outlined previously should be followed. Clearly where complete power failure has occured some steps in the turn OFF procedure cannot be followed.

5.2. GENERAL APPROACH TO FAULT ANALYSIS

The nature of a fault may be isolated by applying the following checks. These are:

1. Is the fault a result of power failure?

2. Is the fault a hardware problem?

3. Is the fault a network problem?

4. Is the fault a software problem?

5. Does the fault affect all units in the system or just one unit?

6. Is it possible to reproduce the problem?

5.3. POWER FAILURE

Power failure may be local (i.e. it affects one or more system units) or general (i.e. it affects all system units).

5.3.1. Power Failure Analysis

The steps are:

1. Determine if the failure is local or general.

   CHECK

   - the neon lights on the rear panel of each unit,

   - the room lights.

2. If the failure is general, then

   - if the room lights are on but the system is without power

   CHECK

   - the main system supply cord is plugged into the wall and the wall outlet switch is ON,

   - that all power boards are turned on,

   - the power boards are connected to the wall outlet,

   - that the fuse for the wall outlet is intact.

   If the room lights are out and the system is without power, no action to restore the power can be taken.

3. If the failure is local, then

   CHECK

   - that the appropriate power board is connected to the wall outlet,

   - that the unit is connected to a power board,

   - that the power board is turned on,

   - that the unit's fuse is intact.

5.3.2. Action to take for a General Power Failure

The steps are:

1. Turn the system off.

2. Turn on a room light and wait until power is restored.

3. After the power is restored, wait until any fluctuations have settled (about 2-3 minutes should be sufficient) and then turn on the system.

NOTE:

In the case of a general power failure, it is possible for the power to be restored before any of the above steps have been actioned. If this happens, the steps in this section should still be followed.

5.3.3. Action to take for a Local Power Failure

The steps are:

1. Turn the affected units OFF.

2. Locate the source of failure and restore power supply.

3. Turn the affected units ON and proceed in the normal manner.

5.4. SYSTEM SEIZURE

System seizure occurs when one or more units stop processing and remain stopped for a significant length of time. Power to the units is maintained and the screen shows details which do not change. The keyboard is inactive. System seizure may result from either a hardware or a software fault.

5.4.1. Action to take for system seizure

The steps are:

1. Check the network cable from the "first" POLY to the disk unit. Restore if this is removed, and processing will automatically resume.

2. Check the network cables to each POLY (ensure units are not bypassed or plugged to themselves).

3. Turn the POLY unit OFF and then ON.

4. Turn the disk unit OFF and then ON.

If system seizure still persists, then it will be necessary to complete a Fault Report form.

5.5. FAULT REPORT FORMS

Fault Report Forms are designed to record system faults which require servicing or action remote from the system site.

Specifically it is not necessary to record on the Fault Report Forms details of power failures, either general or local. Likewise it is not necessary to record details of incorrect network connection.

Details to be recorded are:

i) Hardware faults, for example:

- key not operative,
- disk light never comes on,
- paper cannot be fed into the printer,
- broken cable or connector,
- screen will not come on.

ii) Network faults, for example:

- system seizes when running a specific program,
- although correctly connected, one or more units are seized.

iii) Software faults, for example:

- program will not accept a valid response,
- program fails at a particular point in processing and an error that is clearly not the user's fault is displayed.

Only a few examples of the range of possible errors have been given. Fault reports should be made whenever any errors in these three categories occur.

A copy of a Fault Report Form may be found at the end of this chapter. Fill in the details as appropriate and be specific in your description of the fault giving exact, details of what was being performed, prior to occurrence of the fault. Details of how to reproduce the fault are especially helpful.

If a hardware or program fault occurs, POLYCORP would like to know about it. As well as calling your service agent, send us a copy of the Fault Report Form, detailing the fault. If the fault is in a program we will take remedial action once we receive your notification.

The location and address of the service agent are specified at the time of system installation.

The Polycorp address is - P.O. Box 30-243, Lower Hutt.

PADWGORP

FAULT REPORT FORM

SYSTEM LOCATION	NAME OF USER	TIME	DATE

TYPE OF FAULT (tick appropriate box)		NUMBER OF UNITS AFFECTED (if entire system enter "All")	SERIAL NO OF UNIT AFFECTED (if only one unit)
	Hardware ☐	☐	☐
	Network ☐		
	Program ☐		

DESCRIPTION OF FAULT

GENERAL:

Can fault be repeated at will? Yes ☐ No ☐

If yes, how?

6. SUGGESTED ROUTINE PROCEDURES

Various routine procedures should be followed to ensure the smooth running and use of the system.

1. Pupil access to the system should be carefully controlled. Issue of keys to the room should always be controlled by an instructor.

2. Smoking and the consumption of food (especially drinks) should be prohibited from the room housing the system.

3. Ensure that all cords are placed so that they cannot be tripped over.

4. Do not permit pupils to handle power plugs, power boards etc.

5. Do not permit the pupils to operate the disk unit and specifically they should NEVER handle courseware disks.

6. Record all reportable faults and inform the system supervisor so that a copy may be sent to the Service Agent and/or Polycorp as quickly as possible.

7. Keep backup copies of master disks and store them in a secure, safe place.

8. Before powering off or resetting the POLYDRIVE, or changing disks, check with other users that it is safe to do so.

G L O S S A R Y

Backup	Copies of disks made and stored in safekeeping in case of unintentional destruction of files.
CPU	Central Processing Unit. The central electronic part of a computer containing the internal storage control unit and arithmetic unit.
Cursor	A block (usually white) on the screen which indicates where any key which is pressed will be displayed.
Network Control Unit	A unit which controls the POLY network and houses the floppy disk facility.
DOS	Disk Operating System.
Edit	To transform data into some desired form, usually for output.
Floppy Disk	A circular flexible plastic disk on which data is stored magnetically.
Graphics	Non alphabetic data, i.e. Chunky graphics, teletext graphics and fine graphics.
Hardware	Physical computer equipment as opposed to software or user programs. Includes peripheral devices.
Input	Information transferred from keyboard or disk into the internal storage of a data processing system.
Interface	The communication hardware and software joining POLY with other devices - for example other POLYs, peripheral devices.
Log On	Procedure followed by the user in initiating a session with POLY.
Log Off	To terminate a session on POLY.
Menu	List of programs (topics) contained in a module.
Micro-Computer	A very small computer based on a micro-processor.
Network	Communications hardware and software which link POLYs and the Network Control Unit.

Operating System	The computer software providing an interface between the user's program and the peripherals including the disk unit for the purpose of normal operation.
Output	Data sent out of a computer to an external storage area, i.e. to disk, printer or screen.
Printer	A peripheral device for printing information.
Program	The complete sequence of instructions and routines necessary for a computer to carry out a given task.
Software	The general term for computer programs including both system and application programs.
Storage	A device in or on which data can be recorded, retained and later recovered as required.
Teletext	Type of character generator used in POLY 1 which allows not only printing of text but also colour, flashing, double height, inverse video and a coarse form of graphics (chunky graphics).
Text	Alphanumeric data.
User	Person operating the computer system.