POLY 2 *LEARNING SYSTEM*

polycorp

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POLYCORP

New Zealand Limited

CONTENTS

1.1. INTRODUCTION

This section describes some of the diverse configurations the POLY 2 Learning System offers for learning and instructional applications.

1.2. CLASSROOM NETWORK SYSTEM

The POLY 2 Learning System is a fully integrated, network providing economic use of the microcomputer in a wide range of subject areas across the curriculum.   It is purpose-designed for education to ensure ease of operation, durability, and maximum learning performance.

Each of up to 32 POLY 2's in the network is capable of independent use for courseware, testing, authoring, creative composition or programming.
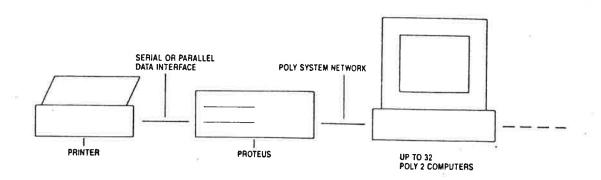
Disk storage of up to 1.2 MByte capacity, printers and other peripherals may be economically shared via the POLYNET communication network.   POLYNET is automatic and therefore requires no operating system knowledge by its users. POLYNET also provides such learning oriented features as BROADCAST, a means of transfer of courseware modules to all POLY 2's in a network simultaneously.

Each POLY 2 features RAMDISK, a portion of dynamic memory which operates like disk storage, providing extremely rapid response to user requirements for data, files, courseware and graphics.   This special memory may be loaded using the BROADCAST feature.

Configuration

The POLY 2 Classroom Network System comprises:

From 1 to 32 POLY 2 Computers, a PROTEUS Computer and an optional printer.   Other peripherals may be attached according to the user's requirements.

1.3. STANDALONE LEARNING AND AUTHORING SYSTEM

POLY 2 may operate separately from the classroom network system when used with
audio cassette tape recorder/player to provide storage and playback of dat
courseware and programs.   This arrangement is particularly useful for individu
tuition separate from the classroom and for modification or authoring of courseware
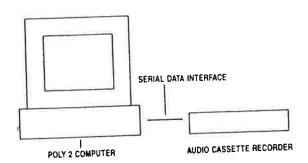
This arrangement utilises the optional Serial Data Interface and Cassette Interfa
Unit to connect to suitable cassette machines.   Serial data is transferred at a ra
of 1200 baud. It is necessary to load the system software to the POLY 2 prior to u
and this takes approximately 90 seconds. The additional time taken to load coursewa
or authoring aids depends on their size.

Programs originated in standalone configuration may be transferred to disk stora
when the POLY 2 is reconnected into a network and information stored on cassette
loaded.

Configuration

The Standalone Learning and Authoring System comprises:

A POLY 2 Computer with optional Cassette Interface Unit and cables, and a Casset
Recorder/Player.

SERIAL DATA INTERFACE

POLY 2 COMPUTER

AUDIO CASSETTE RECORDER

1.4. INTERACTIVE SPEECH SYNTHESIS
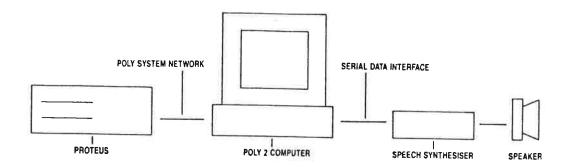
POLY 2 provides "state of the art" speech synthesis to enhance interactive learning programs. This is achieved by use of the EASYTALKER advanced synthesiser to provide crisp, clear natural sounding speech.

The POLY 2 Learning System connects directly to the Speech Synthesiser via the optional Serial Data (RS232C) interface. Both volume and inflexion of speech may be controlled from the learning programs themselves.

Configuration

The Interactive Speech Synthesis System comprises:

A POLY 2 Computer with optional Serial Data Interface, a PROTEUS Computer, and an EASYTALKER Speech Synthesiser.

1.5. INTERACTIVE VIDEO DISK

The POLY 2 Learning System is capable of direct control of video disk via a simp[
robust cable connection between POLY 2 and a compatible video machine.

The interactive system can be used with any video disk having a CAV format, a
limited interaction can be accomplished with video disks having a CLV format.
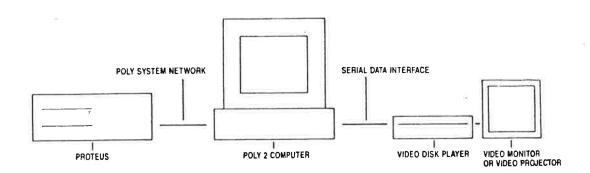
The FORGE Video Editor, developed by PROGENI, allows educators to produce and ed
courseware, tests, lectures or individual instruction interacting with video di
material without the need for knowledge of a programming language.

The system provides exact frame location anywhere on a disk containing 54,000 fram
of information. This provides for video sequences to be selected and display
consistently and "still" frames to be reproduced reliably. This achieves mo
explicit simulation, for highly effective interactive learning.

Configuration

The Interactive Video Disk authoring and delivery system comprises:

A POLY 2 Computer with Serial Data Interface, a PROTEUS Computer, a Video Disk Play
and the FORGE Video Editor.

POLY SYSTEM NETWORK   SERIAL DATA INTERFACE

PROTEUS   POLY 2 COMPUTER   VIDEO DISK PLAYER   VIDEO MONITOR
OR VIDEO PROJECTOR

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1.6. INTERACTIVE VIDEO TAPE

The POLY 2 Learning System is capable of direct control of video tape machines, providing the additional benefits of realistic video for a wide range of educational and program applications.

There is no need to produce special video recordings. Existing video tape material may be utilised by any educator, regardless of programming language knowledge, using the FORGE Video Editor, developed by PROGENI.

The POLY 2 Learning System directly controls all operations of the video recorder/player (Model AG6100), minimising the cost of interfacing. Longitudinal or vertical interval time code recording is not necessary, so the expense of time code recorders and decoders is avoided. A simple robust cable connects the POLY 2 and the tape machine.
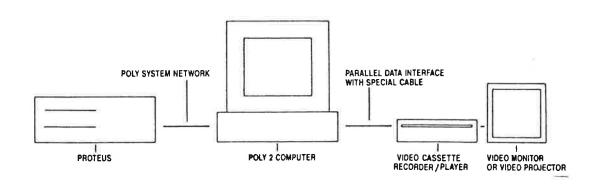
POLY 2 provides a frame location accuracy of better than plus and minus two frames anywhere in tapes containing up to 45,000 frames (30 minutes playing time). This provides for video sequences to be selected and displayed consistently and "still" frames to be reproduced reliably.

The Models AG6200 and AG6100 tape machines provide playback of VHS format in both PAL and NTSC (4.43) systems. Taped material originated on either system may be reproduced and controlled by POLY 2, thus extending the application to a wider range of existing video recordings. Both models feature outstanding durability to maintain original precision of operation.

Configuration

The Interactive Video Tape authoring and delivery system comprises:

A POLY 2 Computer, a PROTEUS Computer, a Tape Recorder/Player Model AG6200 or Player Model AG6100 and the FORGE Video Editor.

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1.7. CP/M OPERATING SYSTEM

Utilising the unique dual operating system capability of the PROTEUS network compu[
the POLY 2 Learning System provides full CP/M compatability. The POLY
implementation is a single user configuration featuring 80 column format
independent control of background and text colours.
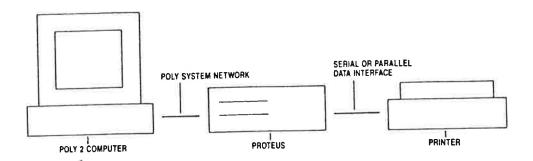
Operation of CP/M is accomplished simply by loading a CP/M system disk rather than
POLY system disk. This provides access to an extensive range of commercial
business software. Applications readily available include word processing, datab[
management, accounting, spreadsheet modelling, course notes, and instruction manua[

The optional high resolution monitor provides a high quality presentation of the
column screen format.

Configuration

The single user POLY 2 CP/M System comprises:

A POLY 2 Computer, a PROTEUS Computer and an optional printer.

POLY SYSTEM NETWORK   SERIAL OR PARALLEL
                           DATA INTERFACE

POLY 2 COMPUTER   PROTEUS   PRINTER

1.8. LEARNING SYSTEM WITH SPECIFIC VISUAL SUPPORT
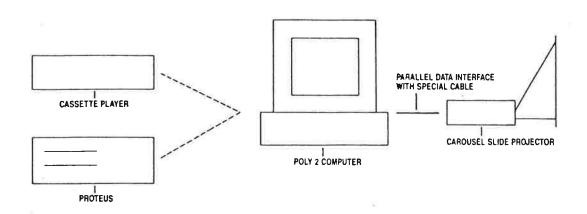
POLY 2 graphic performance may be augmented with the display of specific visual materials by the use of a slide projector.

Carousel projectors having electrical remote control may be controlled directly from courseware via the Parallel Data interface on POLY 2. (A voltage converter unit may be required for some models, and is connected between the POLY 2 and the slide projector.) A carousel may be stepped forward or back, by a prescribed number of slides, to provide limited interactive performance.

Configuration

The slide projector system comprises:

A POLY 2 Computer, a PROTEUS Computer or alternatively a Cassette Recorder/Player, and a Carousel Slide Projector (with Interface Unit if required).

CASSETTE PLAYER

PROTEUS

POLY 2 COMPUTER

PARALLEL DATA INTERFACE WITH SPECIAL CABLE

CAROUSEL SLIDE PROJECTOR

1.9. DISTRIBUTED LEARNING SYSTEM

The POLY 2 Learning System offers new opportunities for economical sharing training and educational resources within organisations and administrations w existing D.P. networks.
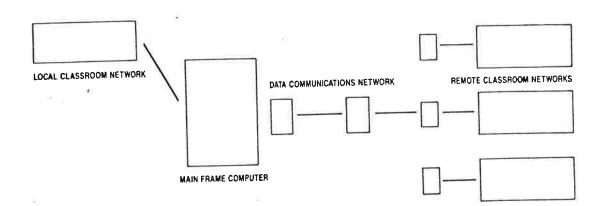
Using the capable interfacing ability of the PROTEUS Computer, any number of lo POLY 2 networks may share communications and centralised library facilities ba upon the D.P. Mainframe, thus making economic use of existing data communicati facilities.

Courseware, student and tutor data, programs and student records, for example, may stored and shared. Courseware or other material produced by a single author facility may be quickly replicated throughout the network of POLY 2 local syste maintaining absolute currency and relevance of material.

The POLY 2 system provides flexibility of communications with most Mainframe machi and communications software already exists for several brands.

Configuration

The POLY 2 Distributed Learning System comprises any number of POLY 2 Learn Systems connected to the D.P. Mainframe via the PROTEUS Computer modem port suitable data communication equipment. Communications software, running in PROTEUS Computer provides any necessary protocol conversion.

LOCAL CLASSROOM NETWORK

MAIN FRAME COMPUTER

DATA COMMUNICATIONS NETWORK

REMOTE CLASSROOM NETWORKS

2.1. INTRODUCTION

This section describes the physical design features of the POLY 2 and the PROTEUS, which constitute the basic hardware of the POLY 2 Learning System. The capabilities of the POLY 2 Learning System extend far beyond these two components, both in advanced software technology and diverse system configurations, as detailed in separate sections of this manual. Further details of the hardware may be found in the POLY 2 and PROTEUS Technical Manuals.

2.2. POLY 2

The POLY 2 is a purpose-designed educational computer comprising a processor, a video display monitor, and a keyboard.

The case is constructed from impact resistant moulded fibreglass, and features EMI/RFI (Electro Magnetic Interference/Radio Frequency Interference) shielding and electrostatic dissipation to ensure correct operation in aggressive environments.

POLY 2 features:

- Motorola 6809, 8/16 bit high performance processor with 16 bit internal data bus and 16 bit arithmetic performance.

- 112 Kbytes dynamic memory (48 Kbytes as RAMDISK).

- 2 Kbytes static memory.

- 4 Kbytes system PROM.

- 16 Kbytes Basic PROM.

- Programmable timer and memory management.

- One headphone socket.

- One POLY 2 network socket.

- One POLY 2 network cable and plug.

- Centronics type parallel interface, and an optional RS232C serial interface.

- POLYSYS Disk Operating System with relevant utilities.

Each POLY 2 features RAMDISK, a portion of dynamic memory which operates like disk storage, providing extremely rapid response to user requirements for data, files, courseware and graphics. This special memory may be loaded using the BROADCAST feature.

Keyboard features:-

- Full QWERTY keyboard with 72 keys, meeting the highest international standar of ergonomics, performance, and reliability.

- Shift key with lock, supporting both upper and lower case characters and control key supporting control characters.

- 32 programmable keys.

- Numeric keypad.

- Four key, cursor control keypad.

- Two dual function editing keys.

- Six purpose-designed learning support keys:

    - calculator mode key,
    - help key,
    - next key,
    - back key,
    - repeat key,
    - exit key.

Connection to the processor is by a single flexible umbilical cable, enabling keyboard to operate at a distance up to 0.5 metres from the POLY 2 computer. optional kit allows for fixing of the keyboard to the processor if preferred. keyboard switches are hermetically sealed in ABS plastic, and have a life expecta of 50 million operations. Colour coding of keys assists in ease of recognition.

The POLY 2 computer has a standard Video Display Monitor with the following featur

- 350mm (14 inch) full colour display.

- Variable sound level control, internal speaker.

- Control of brightness, sound level and vertical hold by front panel controls.

Optionally, a high resolution Video Display Monitor is available (for example, w 60 or 80 column screen formats are to be used extensively). The video moni connects by way of a cable to two 6-pin DIN plugs carrying RGB, sync, sound ground.

The POLY 2 is designed to operate in network clusters of up to 32, sharing storage, printers and other peripherals connected to a PROTEUS Computer.

The power supply for the POLY 2 is 230 volt + 18% - 16% AC 50 Hz.

2.3. POLY VIDEO PERFORMANCE

The POLY 2 has multiple video screens which may be compared to a series of transparencies one in front of the other that appear to the viewer as one picture on the POLY video display screen. The individual screens may be switched ON, OFF, or MIXED as required, The programmer may determine when particular screens are to be displayed and to which one data and graphics are to be written.

If two or more screens are displayed simultaneously, individual dots, or pixels, on the screen may either be displayed on a priority basis or the colour elements from each screen combined to form a composite colour. This allows screens which contain both text and graphics to be displayed simultaneously thus superimposing text and graphics.

Five screens are available for display in the following order of overlay priority:

1.   Text 1   (40 columns by 24 lines, 7 colours)
2.   Graphics 1   (240 by 204 pixels, 8 colours)
3.   Text 2   (40 columns by 24 lines, 7 colours)
4.   Graphics 2   (240 by 204 pixels, 8 colours)
5.   Background   (half intensity full screen, 8 colours)

In addition a Fine Graphics screen (480 x 204 pixels, 8 colours) is available (this is achieved by combining Graphics screens 1 and 2).

As well as the seven colours, white, red, blue, green, yellow, cyan and magenta, black is also available on the graphics screens and as a background.

The use of SELECT and DISPLAY functions allows screens to be prepared without being displayed. Each new screen to be displayed can thus be built up prior to being turned on to the video display. Multiple screens provide free mixing of text and graphics without having to specify text windows. Multiple screen overlaying allows many variations to be easily programmed. For example, the picture on one screen may be kept stationary while a second picture is moved either in front of or behind the first without the necessity of redrawing either. Further, while the picture on the current screen is being displayed, the next picture in a sequence may be drawn on the other screen without being displayed. By continually swapping between screens in this manner, animation may be effected.

Text screens feature:

       Upper and true descending lower case.
       Reverse video.
       Flashing of fields.
       Non-displayed fields.
       "Chunky" graphics.
       Background for characters.
       Double height characters.
       Cursor control.

Graphics screens feature:

21 mixed colours with texturing.
Specification of graphics by either line or boundary description.
Displaying pictures in any position independent of original definition posit
Filling of the area within a defined boundary with any regular pattern.

2.4. PROTEUS

The PROTEUS Computer is the POLY 2 Learning System disk network controller.
PROTEUS provides for storage of programs and operating system software on either
or two 8" diskette drive units. The network controller can accommodate a system
to 32 POLY 2 computers and also controls the shared use of a wide range
peripherals. These include: printers (both serial and parallel interface), mod
mainframe links, plotters, data converters, digitisers, speech synthesisers and o
compatible parallel or serial devices.

PROTEUS features:

-   Dual processors 6809 (Motorola) 8 bit/Z80A (Zilog) 8 bit.

-   64 Kbytes RAM, user available.

-   4 Kbytes ROM.

-   One or two 8" flexible disk drives each with capacity 630 Kbytes (CP/M) or
    Kbytes (POLYSYS).

-   One POLY network socket.

-   Three RS232C Serial Interface ports.

-   Parallel Centronics standard port.

-   One 50-way Disk Extension providing for an optional extra drive unit (additi
    1.2 Mbyte capacity).

-   Compatability with the FLEX operating sysem (FLEX is a registered trademark
    Technical Systems Consultants Inc).

-   Compatability with the CP/M operating system, allowing CP/M files and prog
    to be utilised with a single POLY 2 Computer (CP/M is a mark of Digital Rese
    Corp).

-   POLYNET Operating System with BROADCAST facility.

The power supply for the PROTEUS is 230 volt AC 50 Hz.

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3.1. INTRODUCTION

The POLY 2 Learning System has an extensive library of interactive educational and training programs, supported by comprehensive manuals for background and supplementary reading, teachers' guides, student guides and task sheets where applicable. This combination of program modules and support material is called "courseware". The POLY 2 Courseware Library is continuously augmented with new material.

All courseware embodies the highest professional software standards, and is thoroughly tested for reliability and pedagogic value prior to release.

A summary listing of POLY 2 Learning System Courseware is provided in the "Educational and Training Courseware Directory".

3.2. EDUCATIONAL COURSEWARE

POLY Educational Courseware sets new standards through its combination of colour, animation, text and simulation. It is designed to provide a valuable aid for the teacher and a stimulating, visually attractive, learning experience for pupils.

Throughout all courseware, consistent presentation standards are maintained. The superior capabilities of the POLY System as a delivery vehicle have been fully exploited by each author.

Interaction with the education program libraries is via a menu-driven screen. The POLY System MENU program has been purpose-designed for ease of use and includes a BROADCAST facility. Embodied within the MENU program are full instructions for use which can be accessed by selecting the HELP key.

POLY Educational Courseware provides for the integration of computing into all subject areas.

3.3. FORGE FOURTH GENERATION LEARNING TOOLS

The authoring tools designed for the POLY 2 Learning System provide a pioneering breakthrough in fourth generation software technology. The FORGE Presentation Tools assist the educator to develop instructional software for Computer Based Training (CBT), Computer Assisted Learning (CAL) or Computer Assisted Instruction (CAI).

FORGE Tools eliminate the need to know any programming language, thus providing every user with the ability to create interactive educational modules tailored specifically to meet the needs of their students.

The FORGE Presentation Tools include:

- the Text and Test Editor,
- the Graphics Editor,
- the Sound Editor,
- the Video Editor.

Further authoring aids available on POLY include POLYTAS, PROFORMA, PILOT, POLYM
and POLYART. These authoring aids enable the user to produce interactive course
modules using simple commands. In general, they allow full use of the spe
features of POLY 2 including colour, flashing text, background colours, and do
height text. For detailed descriptions see the Education and Training Course
Directory.

3.4. CP/M APPLICATION SOFTWARE

When configured to support the CP/M Operating System (single unit plus a PROTE
access is provided to the wide range of CP/M-based application programs available
business and office use.

4.1. INTRODUCTION

The POLY system software has been specially developed to support the POLY system as a teaching aid for use in the training or educational environment. Just as hardware has been developed for simplicity of use by people not trained in computer operation, software features have been selected and added that make for simple operation of the system.   The system software features efficient and fast communication with the disk unit for each POLY 2, automatic loading of system software, complete disk interfacing, and management of programming languages.

This section summarizes the operation of POLYSYS and POLYNET, the two components of the purpose-designed POLY 2 Disk Operating System (DOS), as well as the CP/M operating system for use on POLY 2.

4.2. POLYSYS

POLYSYS has been purpose-designed for use in the teaching and training environment, particularly for use with clusters of POLY 2 computers.   User operation is fully automatic, with a MENU being displayed on each POLY 2 screen after log on.   The operating system itself is not visible to the user, it works automatically, obviating the need for any programming expertise.

Often a situation arises when all POLY 2 computers require the same program at the start of a lesson and students then proceed at their own speed through the module. The BROADCAST feature allows all units to be initially loaded, simultaneously, with the same courseware program.   POLYSYS manages all disk accesses and the placement of files on disks. This complete handling gives security of data and simplicity in file handling for programmers whilst programming.   Several levels of protection are provided for disk files.   These include Delete, Write and Password protection. Instructions for protecting and unprotecting files are detailed under the PROT command in the POLYSYS Utilities Manual.

The operating system is supported by utilities which, for example, allow users to COPY files, FASTCOPY disks, PRINT files, list CATalogues, LIST files and FORMAT disks. For further information and utilities refer to the POLYSYS Utilities Manual.

4.3. POLYNET

POLYNET is the communication system which has been specially developed to handle the interface between the POLY 2 computers and the PROTEUS network controller. The system used is a fully automatic, closed serial ring with synchronous HDLC protocol. Physically, the POLY 2 computers are placed in convenient positions and the network plug from each unit is connected to the network socket of its nearest neighbour forming a "daisy chain".   The network plug from the first POLY 2 connects to the network socket on the PROTEUS.   The network cable carries outgoing data, return data,

clock signal and earth signal. The last POLY 2 on the network (the one furthest
the PROTEUS) connects outgoing data and return data lines to complete the ring.
the physical connections have been made the establishment and maintenance of net
performance by POLYNET is fully automatic.   Simplified polling is used to iden
each POLY and to determine whether there are any data transactions to be perfor
ensuring a minimum of interruption to processing taking place in the POLY 2 compu
in the network.

The communication system automatically recognises when units are switched on and
and adds them to or deletes them from the network.   This feature allows POL
computers to be either removed from or added to the system without affecting
operation of other units.   The response time to keyboard commands is perceived
virtually instantaneous when the program being used is stored in the memory of
POLY 2 unit.   Network communication data transfer is automatically optimised to
number of POLY 2 computers connected to the system.

A special feature of POLYNET provides for BROADCAST loading of information into
RAMDISK memory of the POLY 2's within the network.   Up to 48 Kbytes of the POL
dynamic memory can be utilised in this manner producing almost instantaneous resp
to user requirements for data, programs, courseware and graphics.

POLYNET also manages the sharing of files among different POLY 2's on a network.

4.4. CP/M OPERATING SYSTEM

A further feature of POLY 2 is that it supports the CP/M Operating System whe
single unit is linked to a PROTEUS.   The POLY 2 implementation of CP/M feat
separate control of background and text colours.   The high resolution display
recommended, since 80 columns are utilised. The CP/M Operating System is describe
separate documentation.

5.1. INTRODUCTION

This section describes the programming languages and editor supported by the POLY 2 Learning System. For detailed explanations refer to the appropriate documentation.

5.2. POLYBASIC

POLY 2 is supplied with POLYBASIC, an extended Basic which has been purpose-designed to meet the special requirements of teachers and students. POLYBASIC embodies all standard Basic commands with powerful extensions to handle the unique design features of the POLY 2, including management of multiple screens and high resolution graphics.

Movement between POLYBASIC programming mode to other modes of operation is fully automatic and is simply performed by entering the name of the mode desired. For example:

```
Extended POLYBASIC      BASIC   indicated by a yellow 'Ready' prompt.
Text Editor             TEXT    indicated by a cyan 'Ready' prompt.
Disk Operating System   DOS     indicated by a yellow 'DOS' prompt.
```

5.3. POLY TEXT EDITOR

POLY 2 is supplied with the POLY Text Editor, a full screen editor which enables the user to edit and use text that appears anywhere on the screen.

Editing is made very simple by the use of the Character/Line Insert and Delete keys and the unique cursor control keypad. The POLYBASIC editor for editing BASIC programs and the POLY Text Editor have identical commands and key uses. Special commands exist for deleting lines, merging files, renumbering files, etc.

The POLY Text Editor may be used to prepare and edit programs, data files, command files for authoring languages, and text files for documentation purposes. If formatted files (i.e. files with left and right justified lines, pagination, centred text, etc) are required, the POLY Text Editor may be used to prepare input files to be processed by the 6809 Text Processing System (copyright Technical Systems Consultants Inc.) described in separate documentation.

5.4. PASCAL

Pascal is a high level language that allows programming and the teaching
programming using the latest structuring techniques. The Pascal compiler prod
machine code resulting in programs with extremely fast execution times. Pa
programs are entered and edited using the POLY Text Editor. The Pascal comp
implemented on POLY is a adaptation of the Omegasoft (a registered trademark)
Pascal compiler.

5.5. ASSEMBLER

Omegasoft also provide a full 6809 assembler language (supporting the linking
independently assembled modules) which has been adapted for use on POLY 2.

5.6. POLYLOGO

LOGO, the language that provides a sense of mastery over the computer, has
developed for POLY by the Department of Education, Massey University, Palmer
North, New Zealand. POLYLOGO turtle graphics follow nearly identical procedures
those used by Seymour Papert in his original Logo graphics.

5.7. CP/M PROGRAMMING AND EDITING SOFTWARE

CP/M-based programming and editing software may be utilised on POLY 2 in
configuration.

6.1. INTRODUCTION

This section details procedures for the installation of a POLY 2 Classroom Network System, and steps to be followed for system start up and close down.   Also included are instructions on the use of the network BROADCAST facility, and recommendations on disk handling.

The POLY 2 Classroom Network System comprises from 1 to 32 POLY 2 Computers, a PROTEUS Computer, and an optional printer.

The POLY 2 computers share the disk facilities of the PROTEUS Computer and the network printer.

6.2. PROTEUS

Control of the PROTEUS is effected by:

-   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.

-   Insertion/Removal of Disks from the Drives.

    On the door of each disk drive there is a small red light.   Whenever data transfer to or from disk is being carried out, the light on the appropriate drive will be on.   No attempt to remove a disk should be made when the light on the drive is on.

-   A Reset Button.

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

Several external connections are located on the back panel of the PROTEUS. These are:

-   230v Power Source.

    Connection of the 230v power source is via the attached cable and plug. A mains cutout (fuse) is also located on the back panel.

-   Network Socket.

    Connection of the network cable is standard in that all POLY 2 and the PROTEUS units have an identical facility.   The connector is circular and has a locking key to prevent accidental withdrawal and incorrect orientation.

The first POLY 2 computer in the system must connect to the PROTEUS.

-    Printer Port.

     Connection of the printer is via a ribbon cable and RS232C connector.
     connector is a push fit and the shape excludes any possibility of incorr
     orientation. The port is labelled PRINTER. Printers with parallel interfaces
     utilise the parallel port (see below).

-    Other Peripheral Ports.

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

6.3. PRINTER

A printer linked to the PROTEUS may be shared by POLY 2 users in a network. Reques
for use of the printer are satisfied by spooling (i.e.   a copy of the printed outp
is stored on disk and printed on a first-come, first-served basis).

A range of printers may be connected to the system by either the serial (PRINTE
port or the parallel port.

Accompanying each printer should be a manual including such details as:

-    Paper-threading instructions.

-    Instructions for replacing the ribbon.

-    Special print functions.

-    Power connection and fuse facilities.

-    Internal switch settings.

Any printer attached to a PROTEUS in a POLY network should support form feeds a
should be set so that a carriage return does not automatically produce a line fee
With some printers it will be necessary to install POLYNET (which controls printi
correctly to cater for page width, page length, escape sequences to produce elongat
or compressed characters, parallel or serial port connection, etc. since these dif
with different makes of printers.

6.4. POLY 2

Each POLY 2 computer consists of:

- A Processor.

- A Keyboard.

- A Video Monitor.

Control of a POLY 2 is effected by:

- An ON/OFF Switch.

  The ON/OFF switch is located on the back panel of the processor. A lamp indicates when the unit is switched on.

- A Reset Button.

  The reset button is located on the rear panel.

- Keyboard Input.

  The keyboard is divided into three sections; the large QWERTY section, a numeric keypad, and cursor control. There are 72 keys in all providing:

  - 26 alphabetic characters.
  - A large robust space bar.
  - 2 shift keys.
  - A control key.
  - A caps lock key.
  - 2 ENTER keys.
  - 10 numeric characters on the QWERTY section.
  - 25 special characters.
    ! " # $ % & ' ( ) : * - = EXP or ↑ ; + @ , < > . / ? ‖ £
  - 10 numeric characters and a decimal point key on the numeric keypad.
  - 7 colour keys and a flashing key on the numeric keypad.
  - 4 cursor control keys.
  - 6 function keys.
    PAUSE, LINE/CHAR INS, LINE/CHAR DEL, CALC/HELP, EXIT/BACK, REPEAT/NEXT

The ten numeric keyboard keys, the numeric keyboard decimal point key, the six function keys, the four cursor control keys, either of the ENTER keys, the @/£ key and the EXP/‖ key may all be software defined to facilitate ease of use. This feature has been utilised in the POLY application software. As well as the key depressed being identified to the program, the state of the control and shift keys is also made available.

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Special keys are as follows:

ENTER	Either of these keys must be used to terminate any line of in
EXIT BACK	Depressing the EXIT key using SHIFT terminates the current operation. The EXIT key may be software defined, for example return to a menu screen.
	Depressing the BACK key without SHIFT enables the user to re to a previous screen display, as defined by the software.
REPEAT NEXT	Next is used without SHIFT to enable the user to go forward t the next screen display, as defined by the software.
	Repeat is used with SHIFT to repeat the current screen, defined by the software.
PAUSE	Pressing this key causes the program currently executing to suspended. The program may be restarted by pressing any PAUSE may be software defined, for example, disabled.
SHIFT	Keys which carry double captions require the use of this key activate the "upper" caption. The SHIFT key must be held while the key with the required upper caption is depressed.
CAPS LOCK	This key locks when pressed, but will be released when pre again. When depressed all alphabetic characters will appear upper case.
ARROW KEYS	These four keys control movement of the cursor, unless otherw software defined.
Line Line INS DEL Char Char	Line Insert and Delete are used with the SHIFT key. Character Insert and Delete are used without the SHIFT key. These keys a normally used when editing.
CALC	Depressing the CALC key using the SHIFT makes the POLY func as a calculator. When depressed, the user program is interru and the bottom line of the screen cleared to permit entry of calculation. Once the calculation is completed, pressing the key again will restore the screen and continue with the prog CALC may be disabled by the software.
HELP	Depressing the HELP key will produce expanded error explanati It may be software defined to provide useful information (as menus).
CONTROL	Depressing the control key and any other character will cause corresponding control character to be entered.
COLOUR KEYS	These keys are marked for user definition. For example, the ke marked RED may be programmed so that pressing SHIFT and RED change the colour of the characters in the line following cursor to red, and pressing CONTROL and RED will change background colour to red.

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The POLY 2 Computer has all external connections located on the rear panel. These are:

- 230v Power Source.

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

- 230v Power Outlet.

  This is intended for use by the Video Monitor Unit only.

- Network Socket, Cable and Plug.

  POLY 2 is networked by connecting the plug to the socket of the next POLY 2 in the network. Accidental withdrawal and incorrect orientation are controlled by a catch on the plug and socket.

- Video Socket.

  This 6-pin DIN socket is for connecting the Video Monitor Unit.

- Headphone Socket.

  Headphones may be utilised by plugging into this standard headphone socket. The sound output to the Video Monitor is disabled when headphones are plugged in.

- Keyboard Socket.

  The keyboard is connected to the processor via this socket.

- Parallel Port.

  The parallel port provides an interface directly between POLY 2 and compatible peripheral devices.

- 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).

6.5. <u>SETTING UP THE NETWORK</u>

After arranging the room furniture suitably with respect to lighting, access to power sources and space, carry out the following steps:

1. Place the PROTEUS in the most dust free position in the room and ensure there is adequate access for loading and changing of disks. Plug the mains cord into a 230v power outlet.

2. Position the printer near (or on top of) the PROTEUS, and connect the RS232C
    Centronics parallel cable to the appropriate ports on the printer and
    PROTEUS back panels. Plug the mains cord into a 230v power outlet.

3. Assemble the POLY 2 nearest the PROTEUS first:

    a) Place the processor on a desk top or other level surface.

    b) Place the keyboard in the required position and insert the cable in
        KEYBOARD socket on the processor back panel.

    c) Place the Video Monitor on top of the processor (using a monitor swivel
        tilt stand, if so desired). Plug the Video Monitor power plug into
        power outlet on the rear of the processor.

    d) Connect the Video Monitor to the processor via the RGB INPUT socket on
        monitor and the VIDEO socket on the processor using a cable fitted with
        6-pin DIN plugs.

    e) Set the following controls on the monitor:

        -   RGB/PAL switch to RGB (back panel).
        -   SYNC switch to NEGATIVE (back panel).
        -   GREEN/COLOR switch to COLOR (front panel).

    f) Plug the mains cord into a 230v power outlet.

4. Connect the network cable from the back panel of <u>this</u> POLY to the NETWORK sock
    on the back panel of the PROTEUS computer.

5. Repeat Step 3 for all POLY's in the network.

6. Connect each subsequent POLY 2 in the network via the network cable to t
    NETWORK socket on the POLY 2 preceding it.

WARNING: The MAINS OUTLET on the POLY 2 processor back panel is to be used <u>ONLY</u> f
connection of the Video Monitor.

Standard cord and cable lengths for the POLY 2 Learning System hardware are:

-   Mains cords   2m
-   RS232C cable   2m
-   Keyboard cord   1.5m
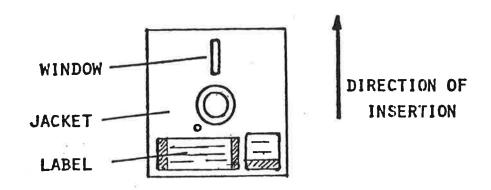-   Monitor cord   300cm
-   Network cable   2m (8m and 16m extensions available)

6.6. DISK HANDLING

The POLY 2 Learning System utilises 8" double or single sided, single density disks (disks capable of double density storage may be used but will only be recorded on in 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.

WINDOW

JACKET
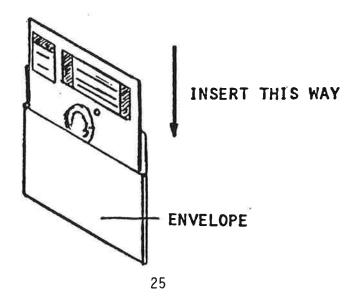
LABEL

DIRECTION OF
INSERTION

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 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".

INSERT THIS WAY

ENVELOPE

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All disks should be suitably labelled. The label on the disk jacket provides identification of the disk and assistance in the orientation of the disk for insertion into the drive.

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

For details on preparing new disks, see the POLYSYS Utilities Manual.

Overwriting or damaging a disk is not uncommon, so it is extremely advisable to keep back-up copies of all disks. To create a direct copy of a disk see FASTCOPY in the POLYSYS Utilities Manual.

To load a disk into a disk drive, carry out the following steps:

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).

2. Release the disk currently loaded, if there is one. When the latch is released, the loaded disk will eject outwards. Replace this disk in its envelope and put it away.

3. Remove the required disk from its envelope.

4. Insert the disk into the appropriate drive, label facing upwards, with the oval cutout end first. The label end will be the last to enter the drive door.

5. The disk is fully inserted when none of the jacket is exposed and a gentle resistance is felt.

6. Close the drive door by pressing the latch down.

If the red indicator light on a disk drive remains on when there should be no disk activity, a hardware fault has occurred. Depress the reset button on the PROTEUS back panel and remove the disk when the indicator light goes out.

6.7. START UP AND CLOSE DOWN PROCEDURES

The following procedures give a "standard approach" for start up and close down of the POLY 2 Learning System. Minor variations may be introduced without damage to the system, but it is strongly recommended that the steps given be followed.

To Start Up the System

1. Ensure all POLY 2 computer and network cables are connected in the correct manner. Ensure all mains cables are connected to a 230v power outlet.

2. Turn on the main power supply outlets.

3. Turn on the PROTEUS Disk Control Unit by switching the MAINS switch down.

4. Turn on each POLY 2 computer by depressing the MAINS rocker switch down (illuminated switch implies power on) - the magenta start up screen will appear.

5. Turn on the printer if required, and ensure that paper is fed correctly.

6. Insert a system disk (a disk containing the POLY operating system) in the PROTEUS Drive 0, and close the disk drive door.

7. When the red indicator light indicating disk activity on the PROTEUS goes out, any of the POLY's on the network may be "booted up" by pressing any key. A "SYSTEM LOADING NOW" message will appear, or if other POLY's are also being booted up an "AWAITING LOAD" message may be displayed.

8. The first POLY 2 started up will request the date and time to be entered:

    -   Enter the date in the form DD,MM,YY (commas optional).
    -   Enter the time in the form HH,MM (24 hour clock, comma optional).

9. The POLY operating system, BASIC and a program called LOGON.BAC (a compiled BASIC program) will be loaded into each POLY, and the program LOGON.BAC executed producing a blue LOG ON screen.

10. Should the POLY operating system, BASIC or LOGON.BAC not be present on the disk inserted in Drive 0 of the PROTEUS, an error message will displayed and the magenta start up screen will reappear.

Logging On to the System

The program LOGON.BAC handles users logging on the system. 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) to a program called 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.

Menu Options

As mentioned previously, after log on, a program called MENU is executed. 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:

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

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

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

> EXIT - will exit the menu program and log the student off returning to
>   the blue log on screen.

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

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

As well, the menu program provides for:

- Entering POLY BASIC programming mode.

- Entering POLY Text Editor mode.

- Entering DOS (Disk Operating System) mode.

- BROADCASTing.

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

- Changing menus (either when the disk is changed, or when more than one menu exists on a disk).

To Broadcast

Broadcast may be used to simultaneously load all POLY 2'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 2 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 first POLY 2 in a network (normally an instructor's POLY, to prevent unauthorised broadcasts). When a Broadcast is initiated, all POLY's in the network will log off, so it is necessary to ensure that all users in the network are ready for a Broadcast.

To operate Broadcast, log on to the POLY 2 directly attached to the PROTEUS as detailed above. When the menu is displayed select the Broadcast option (usually available from a separate screen, but some MENU programs are customised). It will then be possible to either broadcast the log on screen or a particular module. The Broadcast facility is always available from the menu of the first POLY 2 in a network.

Broadcast loading the log on screen will cause all POLY 2's in the network to be logged off. The POLY operating system, BASIC and LOGON will be broadcast to each POLY in the network. As well, MENU will be broadcast loaded to RAMdisk of each POLY in the network. LOGON will then execute in each POLY producing the blue log on screen. Following log on, the menu loaded to RAM disk will be displayed.

Broadcast loading a particular module will cause all POLY 2's in the network to be logged off. The POLY operating system, BASIC and the particular program will be broadcast to each POLY in the network. As well, certain files may be broadcast loaded to RAMdisk of each POLY in the network. The particular program will then execute in each POLY (without the log on screen being displayed). The particular module to be Broadcast may be selected from the menu of the first POLY in the network by the standard method.

While Broadcast is taking place, the message "BROADCAST PROGRAM LOADING" will be displayed. Following load, the message "BROADCAST PROGRAM LOADED" will be displayed prior to execution of the program.

To Close Down the System

1. All POLY's in the network should be inactive, i.e. in BASIC or TEXT mode with no program running, or displaying a menu, or displaying the log on or start up screen.

2. Remove all disks from the PROTEUS, and put them away.

3. Turn off the PROTEUS back panel toggle switch.

4. Turn off each POLY 2 unit back panel MAINS switch.

5. Turn off the printer if required.

7.1. INTRODUCTION

This section details general recommendations for the maintenance of the POLY 2 Learning System, and describes guidelines for diagnosis of equipment failure and steps to be taken regarding system seizure.

7.2. GENERAL RECOMMENDATIONS

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

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

- For classroom use, schools should make 'master' copies of their subject disks. The masters should then be kept in a secure place.

- Closely observe routine procedures for system start up and close down.

- Ensure all users are familiar with proper loading of the disk drive and handling of disks.

- In the event of system seizure or equipment failure make immediate note of the fault description. If the fault occurs repeatedly, or if the fault does not correct itself, fill out the necessary Fault Report Form and contact POLYCORP or your authorised service agent.

- Keep all cartons supplied with the equipment for future shipping.

- When returning any equipment to POLYCORP for repair affix a label to the hardware fully noting who the equipment belongs to and fill out the necessary Fault Report Form.

7.3. FAULT ANALYSIS AND REPORTING

There are three levels of faults. These are:

1. Hardware or network faults, both mechanical and electronic with one or more units affected.

2. Faults of a processing or presentation of materials nature which arise from errors in supplied programs.

3. External faults such as power failure to the system.

If a fault occurs first determine its nature and then proceed as follows:

1. Power Failure

    -   If general (all units affected) immediately turn of all MAINS supply
        outlets. Remove disks from drive. Follow routine close down procedure. When
        power is restored, follow routine start up procedure.

    -   If local (only one unit affected) check that the MAINS power supply is
        connected. Check that all other cords connecting processor, monitor and
        keyboard are connected. Check that all monitor switches are correctly
        adjusted.

    -   If power cannot be restored, record fault circumstances and fill in a Fault
        Report Form for POLYCORP or your local service agent.

2. System Seizure

    System seizure occurs when one or more units stop processing and remain stopped
    for a significant length of time. Power to the unit is maintained and the screen
    display does not change. The keyboard is inactive.

    In the event that all network activity ceases, take the following action:

    -   Check the network cable from the POLY attached directly to the disk unit.
        Restore if this is removed, and processing will automatically resume.

    -   Push the RESET button on the PROTEUS back panel.

    -   If processing has not resumed, remove disks from the drive, turn the drive
        OFF, then ON. System processing should then resume.

    In the event of an isolated POLY 2 seizure:

    -   'Warm Start' the POLY by depressing the "W" key and at the same time the
        RESET button on the processor back panel. Release the reset button, then
        the "W" key. The POLY should return to BASIC mode (and any program loaded
        will still be in memory).

    -   If warm start fails, press the RESET button on the processor back panel.
        The POLY should return to the start up screen, from which the standard
        start up procedure may be followed.

    -   If processing has still not resumed, turn the processor off and then on and
        again try the standard start up procedure.

    In either of the above cases, if processing cannot be resumed fill in a Fault
    Report Form for POLYCORP or your local service agent.

3. <u>Courseware</u> or <u>Software</u> <u>Fault</u>

If a program purchased from POLYCORP or PROGENI fails, an error screen or message is usually displayed. Some errors are due to the user, for example, "Drive not ready", "File does not exist". If you are certain the error is due to software please make a note of the error details and fill out a Fault Report Form to return to PROGENI (the address is given below).

<u>Fault</u> <u>Report</u> <u>Form</u>

A copy of this form is to be found at the end of this section.

The form should be completed as follows:

1.	System Location	- give the name of the school or institution, etc.
2.	Name of User	- in a school situation this will be the name of the teacher otherwise enter the name of the person using the system at the time the fault occurred.
3.	Time	- enter the time at which the fault occurred.
4.	Date	- enter the date.
5.	Type of Fault	- decide which category the fault fits best.
6.	Number of units affected	- give either a number of units or the word ALL.
7.	Identifier of unit affected	- each unit carries a serial number. Enter this number or leave blank if all units were affected.
8.	Program Description	- briefly describe the program being used at the time the fault occurred.
9.	Error in Line Number	- copy this from the screen if displayed.
10.	Error Number	- copy this from the screen if displayed.
11.	Description of Fault	- give as accurate description as is possible of the fault, giving exact details of what was being performed prior to occurrence of the fault.
12.	General	- try and repeat the fault. Details of how to reproduce a fault are particularly helpful when trying to rectify the fault.

Fault Report Forms should accompany any hardware or software fault enquiries.

All software faults should be addressed directly to:

PROGENI, Learning Division,
P.O. Box 44107, VIC,
LOWER HUTT.

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

The POLY 2 Learning System manufacturer is:

POLYCORP New Zealand Limited,
P.O. Box 30243,
LOWER HUT.

POLY 2 Learning System Manual

POLY 2 Computer Technical Manual

POLYSYS Utilities Manual

POLYBASIC Manual

Pascal on POLY

POLYLOGO Manual

POLYPILOT Manual

PROTEUS Computer User Manual

PROTEUS Computer Technical Manual

FORGE Authoring System Manuals.

POLYGORP   FAULT REPORT FORM

SYSTEM LOCATION	NAME OF USER	TIME	DATE

TYPE OF FAULT   Hardware ☐
(tick appropriate   Network ☐
 box)   Program ☐

NUMBER OF UNITS
AFFECTED   ☐
(if entire system
  enter "All")

SERIAL NO OF
UNIT AFFECTED
(if only
  one unit)   ☐

DESCRIPTION OF FAULT

GENERAL:

Can fault be repeated at will?   Yes ☐
                                        No ☐

If yes, how?