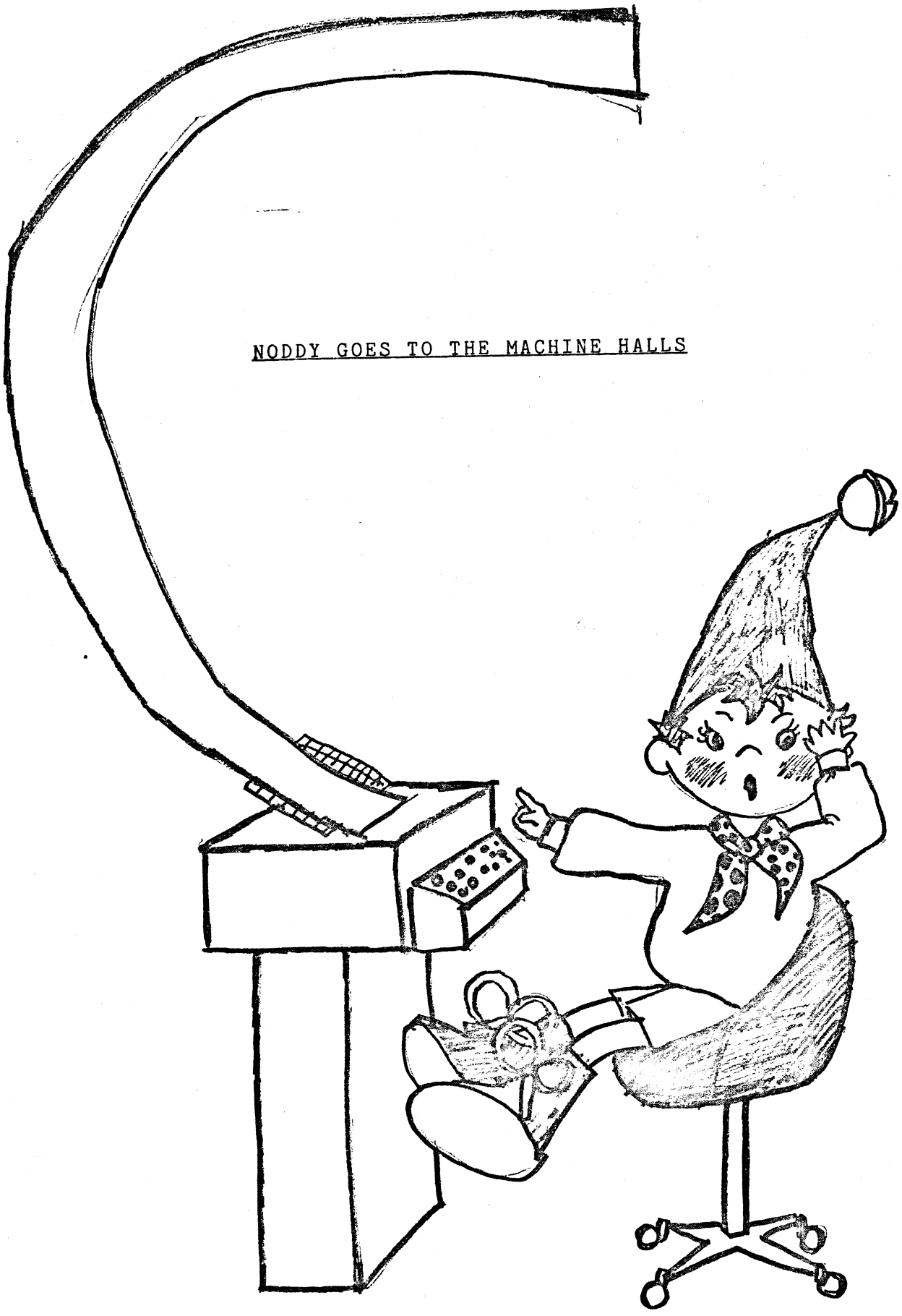
NODDY GOES TO THE MACHINE HALLS



THE DEPARTMENT OF COMPUTER SCIENCE

Using the Various Systems in the Machine Halls.

Kathy Humphry

September 1978.

CONTENTS

Note. This document is on the filestore for user PUB.
PRINT PUB.HELP from the ICL 7502 will produce a line printer listing.

USE OF THE COMPUTER SCIENCE DEPARTMENT'S MACHINE HALLS.

Introduction

The 21 minicomputers of the department of computer science are physically located as shown in the diagram, although seasonal changes may occur with prior notice.

The principal systems are :-

1 ISYS which runs two Interdata clusters

a) ISYS (NORTH)

Hardware:- Interdata 70 processor; 64K bytes of core store; Diablo 30 5 megabyte capacity; Teletype console; data links to the Filestore; four satellite Interdata 74 processors each with 8K bytes of core store; Olivetti console switchable between the satellite and mother machine; data links connecting the satellite and mother machine.

Use:- Second, third and fourth year teaching; general programming and research.

b) ISYS (SOUTH)

Hardware:- Interdata 70 processor; 64K bytes of core store; Diablo series 40 disc with 10 megabytes capacity; Teletype console; data links to the Filestore; four satellite Interdata 74 processors, each with; 16K bytes of core store; Olivetti console switchable between the satellite and main machine; data links connecting the satellites and mother machine.

Use:- Third and fourth year teaching; general programming and research.

2 LEGOS

Hardware:- Interdata 70 processor; 64K bytes of core store; Olivetti console; Tektronix 4002 terminal; data link to the Filestore.

Use:- Research, development of hardware construction aids and hardware design languages.

3 PDP9

Hardware:- PDP 9 processor; 8K of 18 bit word core

store; 3 TU55 DEC tape transports; paper tape reader and punch; Olivetti console; Logabax printer; Tektronix 611 scope; data link to the Filestore.

Use:- Second year teaching, general programming.

4 PDP15/20

Hardware:- PDP 15 processor; 24K of 18 bit word core store; 4 TU56 DEC tape transports; paper tape reader; paper tape punch; Olivetti console; Logabax printer; Tektronix 4002; data link to the Filestore.

Use:- Second year teaching. Graphics projects and research work.

5 PDP15/40

Hardware:- PDP15 processor; 32K of 18 bit word core store; 1 TU56 DEC tape transport; 1 TU10 magnetic tape transport; VT15 graphics processor; multi-channels of ADC and DAC; floating point processor; fixed head disc with 512K word capacity; paper tape reader; paper tape punch; Tektronix 4010; video terminal; 2 VT15 displays; data link to the Filestore.

Use:- Second, third and fourth year teaching. Grpahics projects and research work.

6 PDP11 ERTE.

Hardware:- PDP 11/40 processor; 64K bytes core store; one RK05 disc; Ampex 960 disc drive and System Industries Controller; Dec Writer II console; data links to the Filestore and EMAS.

Use:- SRC funded research into multi-access systems performance.

7 Filestore

Hardware:- Interdata 70 processor; 64K bytes of core store; 9 pairs of data links; Data Products 2260 line printer; Olivetti console; Two CDC 9762 67.4 megabyte storage modules attached via a Systems Industries controller.

Use:- General file support to machines in the Department.

8 ICL 7502

Hardware:- ICL 7502 processor; 12K 16bit words of core store; Visual Display Unit with 128 character set; data links to the Filestore.

Use:- Sophisticated editing and Filestore interrogation.

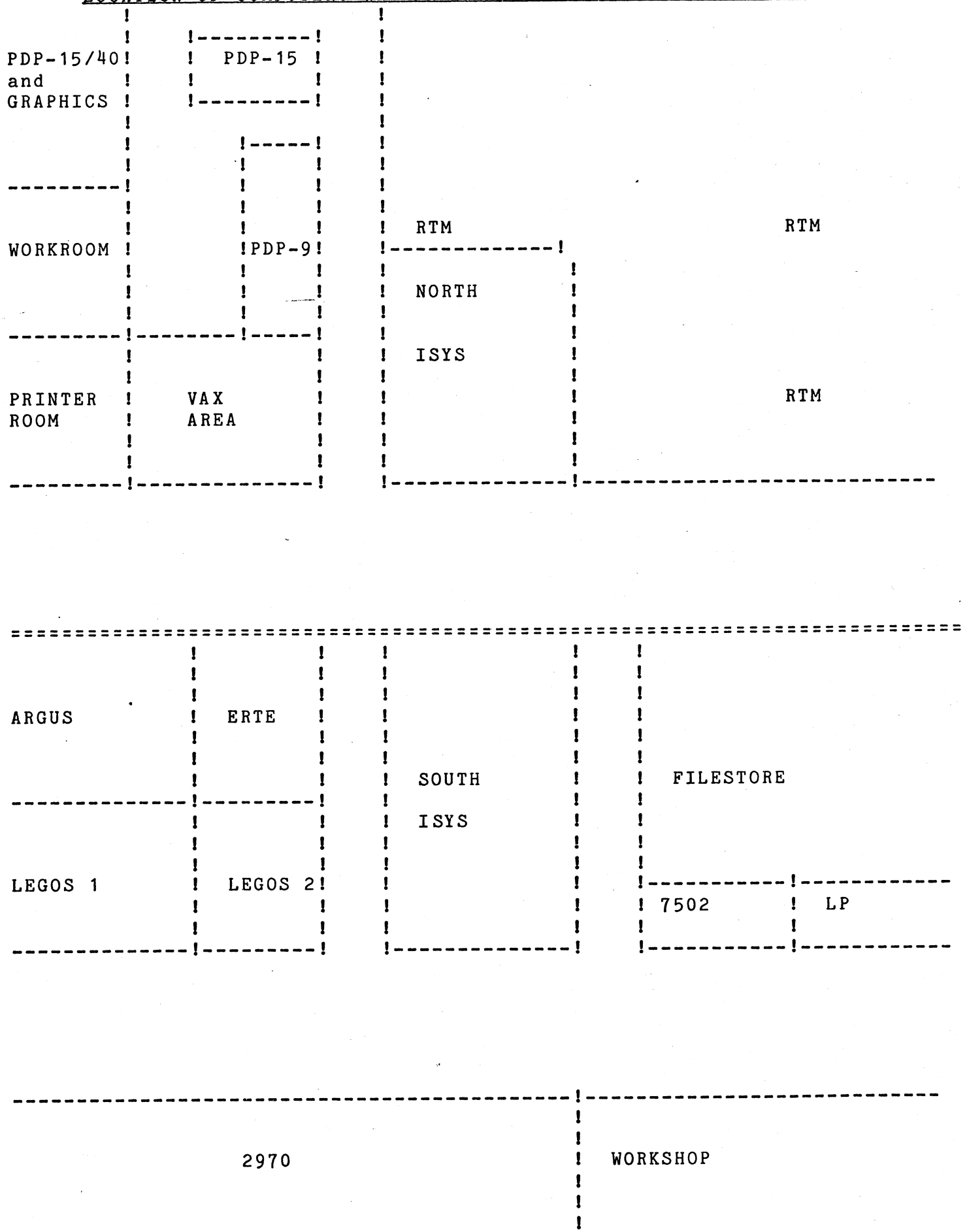
Additional Facilities

These include a Calcomp 563 plotter; Diablo Hi-type lineprinter; Tektronix terminals type 4014, 4010, 4012 and a graphics tablet. There are also two Interdata 7/16 processors available for general experimental use.

These systems can be interconnected by half-duplex coaxial cable links. The present interconnection pattern is shown in Appendix 7.

Note. The 2970 does not belong to the Department but is housed in the Machine Halls for the Edinburgh Regional Computing Centre.

LOCATION OF COMPUTERS WITHIN COMPUTER SCIENCE MACHINE HALLS.



North and South ISYS

ISYS is the Computer Science Department's Interdata teaching system. South ISYS is situated in the South Machine Hall and consists of an Interdata 70 - 'mother' machine labelled South 0, with two series 40, 10 megabyte capacity discs, and four satellite Interdata's labelled South 1 to South 4. Sometimes the South 1 Interdata and teletype are situated in the hardware laboratory (room 3203).
North ISYS is situated in the North Machine Hall. North 0 is an Interdata 70 with 64KB store, two series 30, 5 megabyte capacity discs, and there are four satellite Interdata's labelled North 1 - North 4.

Note. For the rest of this document the convention will be used that all prompts and messages typed on teletypes by a computer will be underlined and all those by the user left as typed.The two character prompt >< put out by ISYS is overprinted by ISYS but has to be left adjacent here.

Loading ISYS

1) Switch on at the Power Supply

2) Switch on at the 'mother' Interdata

3) Switch on the teletype next to it and switch to Full-duplex

4) When the orange 'disc ready' light comes on press the red 'write protect' button. This is initially ON and will go OFF when pressed. N.B. On North ISYS the system disc has its own red 'write protect' button which must also be pressed.

5) Start the system at address X'C0'. (see appendix 3 for how to start)

ISYS identifies itself

ISYS/32

DATE:

6) Type in the 8 character date followed by carriage return as follows -:

10/08/78

- 2 characters for the Day
- slash '/'
- 2 characters for the Month
- slash '/'
- 2 characters for the Year
- carriage return.

If ISYS does not announce itself, there is either some hardware trouble, or more likely, ISYS'S bootstrap loader is not in store. This has to be loaded either from the Filestore or the switches. (Appendix 4 has a listing) If the filestore is running, the bootstrap may be loaded into ISYS as follows :-

1) In ISYS set location X'78' to contain X'8D80'

X'8D' is address of the link from the filestore.

2) Start 50 sequence at X'50'. (see appendices 1 and 2 to load the 50 sequence if it is not already there.)

3) At the filestore type

Z,,.IBOOT:40,ISYS /to load South ISYS

or

Z,,.IBOOT:30,ISYN /to load North ISYS

If the filestore is not running, the bootstrap must be loaded from the switches. See appendix 4 for a listing of the ISYS bootstrap.

The link patch panels are on the front of South 0 and the back of North 0. Normally Link transmitter and receiver 0 are linked to the 'other mother'. Link transmitter and receiver 1 to satellite 1, transmitter and receiver 2 to satellite 2 etc.

Printing is normally done on the fast line printer connected to the filestore, using LP as one of the output streams.

On South ISYS the fast line printer can be used directly if the Filestore is not running.
Plug the transmitter labelled X'62' into the receiver marked LP on the front of South 0. Plug the line printer to the cable marked South 0 which comes out of the floor beside the wire paper basket behind the line printer, and transfer files to LP1 (instead of LP as usual).

On North ISYS there is a link compatible Centronics line printer. Link it to any link transmitter (except LT5). N.B.SHUT the doors at the back of the North ISYS processor to avoid temperature problems. NOTE that large characters are printed on the Centronics printer if the characters DLE and SO are output at the front of a line.

There is available a link compatible Diablo Hi-type printer on wheels so that it can be connected to any machine. On either ISYS plug the Diablo into a link transmitter and switch it on.

>< T DIABLOLIST/LK:B

Please note that the Diablo paper and ribbon are expensive items and the Diablo should be used only for final versions. Trial runs may be done on the line printer.

There are also available link compatible peripherals such as

Paper Tape Reader

Paper Tape Punch

Card Reader,

Graph Plotter

Logabax printers

which can be attatched to link transmitters or receivers as required.

To Logon to ISYS

1) Turn on a teletype switched to the 'mother' Interdata

2) Press the escape key

ISYS identifies itself and requests name-

ISYS32

NAME:

3) Type in your name as an ISYS user or if you only need access to public files, type a carriage return alone.

If you typed a name, ISYS will request your password.

PASS:

4) Type in your password which will not be echoed back.

ISYS types the date on your teletype indicating you are logged on.

DD/MM/YY

The following commands are available on ISYS.

T = Transfer
E = Edit (see ECCE documentation)
EOT = Simulate EOT
FILES = list directory
FREE = List Free List
STOP = Logoff
SPY
STATE

The following programs may be run. They run in the background so only one user can run one of these programs at a time.

Type the program name followed by input/output if necessary.

IMP	The IMP compiler
IMPS	The IMP optimising compiler
LINK	Link compiled IMP programs
HAL	Interdata High Level Assembler
LAYOUT	Document preparation program
FSTORE	Transfer files to or from the Filestore
FSTORED	Delete or Rename files on the Filestore.
PRINT	Print files on the filestore.
SPACE	Find largest available free space.
COMPAR	Compare two files and print out differences.
STRIP	Prepare EMAS Paper tape for ISYS
PUBCLEAN	Cleans off all unwanted public files.
ANALYSE	Prints lists of words used in a source file.
IMP.ALIST	Produces source listing with addresses.
IMP.DECODE	Produces machine code listings

Note.

To abandon from a program running in ISYS press the BELL key twice, when the program is not expecting input from the keyboard or delivering output to the printer.

Further details of ISYS can be found in the ISYS User's Guide.

To run a program written in IMP on a small Interdata.

1) Check the teletype is switched to ISYS

TTY (switched to ISYS)	Small Interdata
2) >< IMP SOURCE/OBJ,LIST	
3) >< LINK OBJ,(OBJ2)/BIN	
	4) Start 50 sequence at X'50'
5) >< T .SYSTEM/LK:B	
The transfer completes	The processor halts
	6) press EXE to start loader
7) >< T BIN/LK:B	
The transfer completes	The processor halts.
8) Switch Teletype to satellite	
	9) Press EXE to start
	The IMP program starts execution

Note

a) The program may be restarted (i.e. from step 9) at location X'70'

b) The loader may be restarted (i.e. from step 6) at location X'60'.

Streams: 0 = TT
1 = link 1
2 = link 2
3 = null.

Note >< IMP.DECODE source,obj/list
produces machine coding listings
>< IMP.ALIST source,obj/list
produces source listing with (relative) addresses of each statement.

To run a program written in HAL on a small interdata.

TTY (switched to ISYS	Small Interdata
1) >< HAL SOURCE/OBJ,LIST	
including appropriate SVC'S for running SYS	
	2) Start 50 sequence
3) >< T .SYSTEM/LK:B	
The transfer completes	The processor halts
	4) Press EXE to start the loader
5) T OBJ/LK:B	
The transfer completes	The processor halts
The program is now loaded	
	6)Switch the TTY to small machine
	7) Press EXE

The loaded program is entered at its first (lowest address) location with input and output stream 0 selected

Note

a)The program may be restarted from location X'70' at any time

b)The loader may be restarted at location X'60' (from step 4)

To load Stand Alone programs

TTY (switched to ISYS	Small Interdata
	1)Start the 50 sequence
2) T .LOADER/LK:B	
The transfer completes	The processor halts
The Loader is now in the small machine.	
	3) Press EXE
4) T OBJ/LK:B	
The transfer completes	The processor halts
The program is now loaded in the small machine	
	5)Pressing EXE will enter the program at the first (lowest address) location in the relocatable code area. or 5)Start by setting up the address manually.

Note a) The LOADER can be started/restarted at location X'60' (assuming the program has not overwritten location X'60' - X'65').

b) The address of the start of the relocatable code area is contained in location X'64'.

c) The program may be restarted from location X'70' (assuming locations X'70'-'73' have not been overwritten).

The Filestore

The filestore consists of an Interdata 70 with 64Kb of store, interfaced to a single CDC 9762 disk drive with 67.4 Mb capacity. The second disc is used for backup. The function of the filestore is to store files for other machines that are known as 'clients'. Full documentation is available, see appendix 8. A copy is left permanently beside the filestore and personal copies are available on request.

Those clients with 'semi'-permanent connections to the filestore are

ICL 7502
North ISYS
South ISYS
LEGOS
PDP-9
PDP-15
PDP-15/40
PDP-11

To manipulate files on the filestore from any of these machines see the appropriate section.

Loading the Filestore

1) Switch on:

a) PDU 3

b) The filestore Interdata

c) Whichever disc drive that is connected

d) The teletype next to the filestore (full duplex)

e) Switch on ISYS and Log on (see section 1 above)

Then-	At Filestore	At ISYS (North or South)
	2) Key in 50 sequence (see appendices 1 and 2)	
	3) Start 50 sequence	
		4)>< T .LOADER:B/LT5:B
	5) Press EXE	
		6)>< T .FBOOT:B/LT5:B
	7) Start at X'300'	

The 'verify' program will identify itself

VERIFY 2:0

PARTITION A COMPLETE

PARTITION B COMPLETE

FILESTORE SYSTEM 17.4 ON DISC CS001

Date (day/month/year)?

8)Type in the current date.

The filestore prompts:

Day of week?

9)Type in the three character day of the week.

The filestore prompts:

Time (24hours.minutes)?

10)Type in the time accurately.

Date and time must be accurate as they are used for date-stamping files.

If 'verify' indicates trouble (a DUPLICATES message) the prompts will not be received and the system cannot be loaded. Call one of the Filestore system programmers.

11) Switch on the line printer and press the on-line button.

12) Type LPON to have all files sent to the line printer printed.

13) If neither North or South ISYS is available the Filestore's bootstrap loader can be keyed in. (see appendix 5) for listing of the bootstrap).

14) The Line Printer is connected to the filestore by a cable labelled 'filestore' attatched to the wire basket at the back of the printer.

When the filestore is running, see the appropriate section on how to use it from individual clients.

There is also a console attatched directly to the filestore which may be used for console commands. eg-

RETRY,LP

if the line printer has gone off during the printing of a file and the rest of the file is to be printed when it is on-line again.

KILL,LP to stop printing the current file

LPON to switch LP printing ON

LPOFF - to switch LP printing OFF

BIT9,LP - to end off a file sent from ISYS if it is stuck.

ABORT,ISYS to clear device ISYS
PDP9 P15 ISYN LEGOS 1540 P11 7502

Do not ABORT,TTY

Owners on the filestore should set up their own passwords. Note that these must be null or the same as their ISYS passwords if it is desired to access files for that owner from ISYS. If the STX key is pressed on the filestore's teletype at any point in a line of input, the remainder of the line is not echoed back, eg the password need not be printed out.

To set up a password:-

1) log on by typing L,ownername,pass(if any)

The filestore replies with a user no.

2) type PASS,USERNO,NEWPASS,NEWPASS2

3) log off by typing M,userno

Sometimes 'subliminal' files appear in a user's directory. They are usually caused by a user on the 7502 pressing the white button and ERASE MESSG keys simultaneously. To delete these files log on to the ICL 7502 (see below) and run the program 'SUBDEL'. SUBDEL will not work unless the Filestore has been taken down and reloaded since it happened.

ICL 7502

The ICL 7502 is usually positioned to the right of the filestore. It consists of a VDU and keyboard and a small flat 'box', usually on the left of the screen.

To load the 7502

1) Switch OFF (if it is already ON)
The ON/OFF switch is at the back left of the flat box.

2) Switch ON the screen (a white switch under the screen.)

3) Switch ON -the display will show garbage.

4) At the filestore console type
Z,,I7502.SYSTEM:P,7502
The 7502 screen should then display the 'Help' information. and Command:

To display 'Help' at any time, type
SHOW I7502.HELP
at the 7502 keyboard or

PRINT I7502.HELP
to get a listing of the 7502 help information on the fast line printer.

If loading does not work -

5)At the filestore console type -
ABORT,7502

repeat steps 1 to 4 again.

Note To escape from 'SHOW' do not press the white button. ERASE MESSG key alone is used to reenter the Command mode correctly. Type %A to abort from the Editor. This leaves the output file transient, and it must be deleted ('D') by the user.

The white key and ERASE messg causes an orderly shut down. The screen goes blank for approximately 2 seconds before the 'Command:' prompt reappears.

LEGOS

LEGOS is a large Interdata 70 (64k memory) with two terminals. It has no backing store and uses the Filestore directly. Programs and files are kept on the filestore. When the Filestore is not running LEGOS cannot be used.

LEGOS was developed by a group of Computer Science graduate students as an aid to their own research. It is intended for their own use and may be altered by the LEGOS group as they find necessary.

To load LEGOS

1a) Start at X'C0'. If this fails to bring the system up then do steps 1b) and 2b)

1b) Start the 50 sequence on the LEGOS machine

2b) At the filestore type z,,legos.legos,lego

3) The system should automatically identify itself on one of the terminals as follows:

```
LEGOS09

_
```

All ISYS commands are available on LEGOS. General programs such as HAL, IMP, LAYOUT, LINK, ALIST and DECODE are also available. There are many special LEGOS commands and programs. For details see the LEGOS User's Guide.

PDP-9 and PDP-15

The PDP-9 and PDP-15 are used in this department interchangeably. They are loaded with an 'IMP' System consisting of commands and an operating system suitable for running programs written in IMP. Each machine is dedicated to one user. The peripherals available are paper-tape reader and punch, line printer, links both to the filestore and to South ISYS, and a set of DEC tape units. Users may borrow a personal DEC tape. DEC tapes consist of 578 blocks (containing 256 18-bit words each) but individual files can be no longer than about one fifth of that size due to the way information is usually stored.

To load the PDP-9 or PDP-15

1) Switch on the power supply

2) Check that all DEC-tape units are switched to the OFF position. (i.e. Neither in the 'LOCAL' nor 'REMOTE' position).

3) Switch on the PDP-9 or PDP-15

4) Press the STOP switch and I/O RESET switch. (simultaneously on the PDP-15)

If the Filestore is running.

5) Load the paper tape bootstrap with FST HRI-20 punched in visual format on the front, into the paper tape reader. The paper tape can be placed in the reader with any of the visual characters under the read head.

6) Set the address switches to 20 octal.

7) Data switch <0> should be in the 'filestore' position.

8) Switch on the Teletype or VDU attatched to the machine to Full Duplex.

9) Press the Hardware Read-in switch.

The system types:

IMP15(F) 11/10/77

or if the filestore is not running.

5) Load the paper-tape bootstrap with DT HRI-20 as the only visual characters punched on the front.

6) Set the address switches to 20 octal.

7) Data switch <0> should be in the 'dec-tape' position.

8) Switch on the teletype or VDU attatched to the machine to Full-duplex.

9) IMP System Dec-tape labelled IMP 15 SYS or IMP 9 SYS (they are identical) should be mounted and that drive switched to 0 or 8. (Some of the drives can be dialled up from 0 - 7 and the other drives from 1 - 8. 0 and 8 are used interchangeably and the other numbers have the same meaning on both types of drive.)

10) Press the Hardware Read-in switch.

The system types:

IMP15(F) 11/10/77

Commands on the IMP-9 or IMP-15 system -

T	input/output	Transfer
BT	input/output	Background Transfer.
D	filename!	Delete file
F	Unit	List files on that Dec-tape.
N	oldname/newname	Newname for a file on Dectape.
C	source/object,map	Compile.
L	object-library	Library select.
R	inputstreams/outputstreams	Run the last compiled program where none is specified.
UU	DTx	Defines default user tape where none is specified
WU	DTx	Defines work tape unit number

Use of BT is not recommended to/from work 'tapes' when running in Filestore mode.

General Commands.

E	input/output	Edit
S	scratchfile number	Create a Scratch file.
A	control input/control output	Assign command/report streams
.COMPAR	input1,input2/output	Compare two files
.PRINT	filename	Print a filestore file.
.SOAP	input/output	Indent an IMP program.
.LAYOUT	input/output1,ouput2	Document producing program.
.FSTORE	filename	Transfer to and
.FSTORE	/filename	Transfer from filestore.
.FSTORE		Delete and rename filestore files.

Using the Filestore from the PDP-9 or PDP-15.

Whilst the data switch <0> is in the 'filestore' position all files to and from the system 'tape' or work 'tape' are actually coming from or going to the filestore. Whilst the data switch is in the 'dec-tape' position the files are being read from or written to dectape.

Whichever position the switch is in, a user's files may be transferred to or from the filestore, naming whichever user on the filestore is required. Filestore files also can be printed on the fast filestore line printer on command from the PDP-9 or PDP-15.

To do this use one of the following :-

.FSTORE	(FS for short)
.PRINT	(PR for short)

They are used as follows :-

.FSTORE /file	to receive a file from the filestore.
.FSTORE file	to send the file to the filestore.
.FSTORE	to rename or delete a filestore file.

After one of the three commands above have been entered the program prompts :-

Name,pass:	Type in the relevant filestore username and password. or just CR if the permissions allow it or just name if the password is null.

If you had typed the last of the three commands, i.e. .FSTORE on its own, the program now prompts :-

(D)elete or (R)ename	and expects a 'D' or 'R' response.

the program prompts :-

File:	type the name of the file on the filestore

to be read from,

written to or deleted.

In the case of Rename the program prompts:-

Old,New: Type in the two names separated by a comma.

i.e. The destination or source of the file on the IMP system is specified in the original command, and the destination or source of the file on the filestore is specified by direct response to prompts from the Filestore Program.

.PRINT is used to print filestore files on the fast line printer.

.PRINT Impfile Will print a file from the IMP system on the fast line printer.

Or, if the file is already on the Filestore:

.PRINT

the program prompts:-

Name,pass: Type in the filestore user name and password.

The program prompts:-

File: Type in the file name.

The file named above belonging to the particular user named above will be printed on the fast line-printer.

.PRINT

Name,pass: JOE,ABC

File: :e

Will print the file DIRECTORY:E for user Joe. i.e. His full directory, on the fast line printer. 'DIRECTORY' can be left out in response to the 'file' prompt.

PDP-15/40

This is the same as the PDP-9 and PDP-15 system except that it is a multi-user system. At present there are two users allowed

User 0 on the DACOLL VDU allocated 14 1/4 K store.

User 1 on the TEKTRONIX 4012 allocated 16K.

Double escape will only reload your own subsystem. If this does not work, the whole system must be reloaded (after consultation with the other user if there is one).

To Reload the System.

1) RESET and STOP buttons pressed simultaneously.

2) START with address switches set to 40 octal.

The system responds:

IMP15 Subsystem 10/01/77

Command:

If this does not work use the short disc bootstrap loader. These sit in the metal paper-tape filing cabinet on the wall opposite the PDP-15/40. If necessary the bootstrap can be keyed in (see Appendix 6). The paper tape is loaded with the address switches set to 40 octal and the Hardware Read-in button is pressed. This system runs off disc and not the filestore. However a users files on the filestore can be accessed as with the PDP-9 and PDP-15/20 by using .FSTORE and .PRINT.

The PDP-15/40 has no BT command (see PDP-9/15)
The default DEC-tape settings are:-

User tape	DT1 for User 0
	DT3 for User 1
Work tape	DT2 for User 0
	DT4 for User 1

For full IMP system description see the PDP-9/15 User's Guide.

PDP-11 (ERTE)

The PDP-11/40 is owned by the SRC, and is intended for use in connection with research into performance evaluation of multi-access computer systems, as part of the Edinburgh Remote Terminal Emulator (ERTE).

While not available for general departmental use, the PDP-11/40 does have a direct link to the RCO network (including EMAS and the 2970) and thus can be used to help transfer files between the filestore and, say, EMAS. Potential users are warned that the PDP-11/40 is often left running unattended for long periods, and are advised to consult a member of the ERTE group if the machine's status is unclear

Starting the system and running the file transfer program

1) Switch on the PDP-11/40

2) If the RK05 disc pack labelled "USER DISC" is not on the disc drive on the left side of the cabinet, load it.

3) Set the LOAD/RUN switch on the disc drive to RUN.

4) Put down the HALT switch

5) Set the address switches to 773010 octal.

6) Raise HALT, press LOAD ADR, then press START

7) The DEIMOS operating system will identify itself on the Decwriter, followed by a command prompt:-

.

DEIMOS VSN 4

DISC VERIFY:OK

><

8) Type the command:-

MOVE (keyboard conventions are as for ISYS)

9) The following dialogue then takes place:-

1) System 2) User

HOST:

EMAS or 2970

DIRECTION:

T (to host) or F (from host)

HOST FILE:

Name of file on host system
(in form <user>.<name>)

PASS:

i) (To host)
Background password, or
'.' followed by the
Foreground password if the
former is not known.
In this case, the users
background password will be
changed to 'BACK'.
ii) (From host)
Foreground password.

FILESTORE FILE:

Name of file on filestore.
(in form<user>.<name>)

PASS:

The password of sufficient
authority for required operation.

The transfer proceeds and then:-

COMPLETED-ANOTHER?

Y -(to repeat sequence)
anything else -(to exit)

10) Put down the HALT switch

11) Set the LOAD/RUN switch on the disc drive to LOAD.

Appendix 1

Reminder of HEX digits.

```
0000 = 0
0001 = 1
0010 = 2
0011 = 3
0100 = 4
0101 = 5
0110 = 6
0111 = 7
1000 = 8
1001 = 9
1010 = A (10)
1011 = B (11)
1100 = C (12)
1101 = D (13)
1110 = E (14)
1111 = F (15)
```

Interdata 50 sequence in HEX.

Location	Contents
X'22'	X'0'
X'34'	X'8000'
X'36'	X'0050'
X'50'	X'D500'
X'52'	X'00CF'
X'54'	X'4300'
X'56'	X'0080'
X'78'	X'8880'

Appendix 2

To key in data to an Interdata 70 or 74.

1) set SGL and RUN switches UP.

2) Press INT switch.

3) Set rotary switch to ADR MRD (1 o'clock position)

4) Set up address on switches (in HEX)

5) Press EXE.
The address to be filled will show in the lower display lights this first time and in the upper lights for subsequent addresses.

6) Set rotary switch to ADR MWR (12 o'clock)

7) Set SGL DOWN.

8) Set the data to be stored on the switches.

9) Press EXE.
The data which has just been stored will be displayed on the lower lights and the next location to be filled will show on the upper lights + 2 on from the previous location.

10) Continue to set the information on the switches and depress EXE (steps 8 and 9) until a new non-consecutive address is to be filled or you have finished.

Appendix 3

To start an Interdata program running (e.g. the 50 sequence.)

1) Set SGL and RUN switches UP.

2) Press INT

3) Set rotary switch to ADR MRD (1 0'clock)

4) Set the start address on the switches (eg X'50')

5) Press EXE

The address set will be displayed in the lower lights.

6) Set the rotary switch to PSW (3 o'clock)

7) Set RUN switch DOWN.

8) Press EXE.

Appendix 4

ISYS Disc Bootstrap

Location	Contents	
00C0	DI70	
00C2	00C8	
00C4	D0E0	
00C6	0034	
00C8	00F8	
00CA	00F0	
00CC	00B6	
00CE	00C7	C7 for South ISYS
	00C6	C6 for North ISYS
00D0	0030	
00D2	0100	
00D4	2FFF	
00D6	0001	
00D8	00DA	
00DA	4070	
00DC	0036	
00DE	9EAE	
00E0	9DA0	
00E2	20F1	
00E4	9A9E	
00E6	9E9E	
00E8	988C	
00EA	988D	
00EC	9E8B	
00EE	9D80	
00F0	20D1	
00F2	9980	
00F4	090D	
00F6	033C	
00F8	2200	

Start ISYS disc bootstrap at location X'C0'.

Appendix 5

Filestore Bootstrap

Location	Contents
0300	D100
0302	0334
0304	D0E0
0306	0034
0308	0000
030A	9E4D
030C	984C
030E	9843
0310	9E5A
0312	9E59
0314	9851
0316	9850
0318	9852
031A	9856
031C	9E57
031E	9E48
0320	9D46
0322	2081
0324	9E4D
0326	9E5B
0328	995B
032A	9E5A
032C	08BB
032E	4330
0330	0058
0332	2200
0334	0000
0336	0060
0338	4000
033A	7FFF
033C	00F0
033E	00BF
0340	0000
0342	0062
0344	0030
0346	009C
0348	00E4
034A	008A
034C	0000
034E	0008
0350	0000
0352	030A

Start Filestore Bootstrap at X'300'.

Appendix 6

PDP-15/40 .BOOTSTRAP

Address	Data	(both octal)
40	200057	
41	040037	
42	760100	
43	040036	
44	200056	
45	707047	
46	707001	
47	600046	
50	707272	
51	707242	
52	740100	
53	600105	
54	740040	
55	600040	
56	000002	
57	000077	

1) Set first address on address switches

2) Set first data word on data switches

3) Press 'DEPOSIT NEXT' key
   The data just deposited should appear on the 'memory buffer' lights. The address of the location just deposited into should appear on the 'REGISTER' lights if the register display selector is in the correct position (see below).

4) Set next word on data switches.

5) Press 'DEPOSIT NEXT' key
   As before, the data and address should appear on the appropriate lights.

6) Repeat steps 4 and 5 as necessary.
   Sometimes the 'DEPOSIT NEXT' key persistently refuses to work. In this case, steps 1, 2 and 3 must be used, setting up a new address for every word.

The register display selector is the rotary switch next to the ON/OFF switch. Its position is indicated by either of the two white sectors on its left and right. There is a 'red group' switch, which selects either the left sector (when lowered) or the right sector (when raised). Normally this selector is either in the 'OA', 'PC' or 'AC' position, which are adjacent to each other and appear on the left-hand sector. Hence the 'reg group' is hardly ever in its raised position.

Appendix 7

Some of the usual link connections

South ISYS LT0 (X'98')	-> North ISYS LR0 (X'88')
South ISYS LR0 (X'88')	<- North ISYS LT0 (X'98')
South ISYS LT1-LT4(X'99'-'9C')	-> South satellites LR0('88')
South ISYS LR1-LR4(X'89'-'8C')	<- South satellites LT0('98')
South ISYS LT5('9D')	-> Filestore (X'88') (9-bit)
South ISYS LR5('8D')	<- Filestore (X'98') (9-bit)
North ISYS LT1-LT4(X'99'-'9C')	-> North satellites LR0('88')
North ISYS LR1-LR4(X'89'-'8C')	<- North satellites LT0('98')
North ISYS LT5(X'9D')	-> Filestore (X'8A') (9-bit)
North ISYS LR5(X'8D')	<- Filestore (X'9A') (9-bit)
LEGOS (X'98')	-> Filestore (X'8F')
LEGOS (X'88')	<- Filestore (X'9F')
PDP-9 LK0	-> Filestore (X'89')
PDP-9 LK0	<- Filestore (X'99')/
PDP-9 LK1 (or LK)	-> Logabax printer
PDP-15/20 LK0	-> Filestore (X'8E')
PDP-15/20 LK0	<- Filestore (X'9E')
PDP-15/20 LK1 (or LK)	->Patch panel behind the machine
PDP-15/40 LK0	-> Filestore
PDP-15/40 LK0	<- Filestore
PDP-15/40 LK1 (or LK)	-> PDP-15/20'S logabax printer
PDP-11	-> Filestore (X'87') (9-bit)
PDP-11	<- Filestore (X'97') (9-bit)
ICL 7502	-> Filestore (X'8D')
ICL 7502	<- Filestore (X'9D')

Appendix 8

Documentation available

Document	Filestore	ISYS	PDP9/15	7502	LEGOS	CSR#
Filestore description.	x			x	x	5
ISYS User's Guide		x			x	4
IMP Systems and Utilities Guide			x			6
IMP 9/15 User's guide			x			3
I7502 'HELP'				x		
LEGOS desc.					x	
IMP manual		x	x	x	x	CSR-19-77
LAYOUT		x	x	x	x	CSR-21-78
ECCE		x	x	x	x	
FSTORE program		x	x			
PRINT		x	x			
HAL70	x	x	x	x	x	
HAL7502				x		
Interdata 74 System		x				
Dept of Computer Science Handbook						

Maintenance

Software:-	Filestore	Kathy Humphry
	ISYS	Kathy Humphry
	PDP9/15	Allan Vernon
	7502	Rainer Thonnes
	LEGOS	Paul McLellan
	PDP-15/40	Rainer Thonnes
	PDP-11 (ERTE)	Gordon Brebner

Hardware:- Jimmy Johnstone, John Dow, Eric McKenzie or Peter Lindsay.