

PRENTICE COMPUTER CENTRE

UNIVERSITY OF QUEENSLAND, ST. LUCIA, QUEENSLAND, AUSTRALIA. 4067.



NEWSLETTER

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CONTENTS

- 1.0 Newsletter Summary.
 - 2.0 Removal of MIDAS Program from KL-10.
 - 3.0 International Access from AUSTPAC Gateway.
 - 4.0 International Mail and File Transfers.
 - 5.0 Application of Computers in the Chemistry Department.
 - 6.0 File Transfers between the IBM 3083 and UQVAX::.
 - 7.0 IBM Printer Output for GRIFIN Users.
 - 8.0 Information Concerning Courses.
 - 9.0 Departmental Equipment for Sale.
- STOP PRESS — PDP 11/34 Upgrades.

Authorized by the Director of the Computer Centre

Principal Service Centres

Extensions

Operations Manager	3471
Contract Programming & Feasibility Studies	3944
System Status Automatic Answering	3101
General Enquiries & Course Enrolments	3018
Training & Courses	3021

Consulting

PROBLEM AREA	MAIL BOX	NAME AND EXTENSION
IBM HELP Desk	CHELP	Christine Gibson 3941

Operations and Programming

Accounts	ACCOUNTS	Carol Walker 2188
Cobol	COBOL	Porl Gordon 2953
Commands, system use and probs	COMMANDS	Ian Otto 4075
		Greg Lehmann 3020
Database	DATABASE	Brett Peterson 2836
		Marie Bultreys 2835
Fortran	FORTRAN	Noela Meier 3023
Graphics	GRAPHICS	Mark Williams 2921
Micros	MICROS	Peter Akers 2951
Network	NETWORK	Bryan Claire 4078
		Arthur Hartwig 4079
Operations	OPERATIONS	Senior Operator 3212
PDP-11 Software	PDP11	Danny Smith 2921
Program Library	LIBRARY	Lee MacDonald 3943
Statistics Packages	STATISTICS	Barry Costin 3022
Text processing, Typesetting	TEXT	Andrew Broughton 2837
		Porl Gordon 2953
Non-specific problems	OPERATIONS	Senior Operator 3212

Engineering and Maintenance

Development and communications	ENGIN	Graham Rees 3288
Mini/Micro support	ENGIN	Alan Langdon 4018
		Martin Nicholls 3942
Mini and terminal maintenance	MAINT	Maralyn Kenley 3938
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Computing Co-ordinator	7561

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1. Newsletter Summary

- Access to overseas computer networks is now available through Telecom Australia's packet switched network (AUSTPAC) via a gateway developed at the Prentice Computer Centre. A number of users may now simultaneously access overseas networks and KL10 computer usage is no longer necessary to make connections. The network connection has been increased to operate at 4800 bps. Electronic mail and file transfer facilities are available to those overseas hosts which conform to standards for the UK research network.
- The Chemistry Department has provided an article on the application of computers in instrument control and data acquisition. We are grateful for this and would welcome contributions from other departments.
- Detail is provided on the initial implementation for transferring files between the IBM system and VAX 11/780 system. The Centre is currently working to improve the system by removing the restriction on length of records.
- Information concerning courses to be conducted by the Centre is provided.

Director
extension 2189

2. Removal of MIDAS Program from KL-10

The Overseas Telecommunications Commission (Australia) have issued the following proclamation (received on 6 July 1984):

"The MIDAS service has been substantially upgraded over the past year. This upgrade has been made in order to bring the MIDAS service into line with the emerging packet switching standards that are being established by all international carriers.

It is OTC's policy that international standards should be adopted as such standards ensure a high grade of service between you and your host computer, irrespective of the destination, country, or network.

In upgrading the MIDAS service, it has been necessary to make some changes in the way you make MIDAS calls. These changes will mean that instead...."

These changes take effect from 23 July 1984. As noted elsewhere in this newsletter, the AUSTPAC gateway now allows access to overseas computers. This service is a considerable improvement over that available from the MIDAS program, so it is considered inappropriate to waste resources upgrading the MIDAS program at this time.

The improvements offered by the service through the AUSTPAC gateway are:

1. A number of users may simultaneously access overseas computers through an AUSTPAC gateway whereas the MIDAS program is limited to supporting one user at a time.
2. The MIDAS program runs on the KL-10 and so costs users KL-10 time and memory usage; and response is dictated by that of the KL-10 system. The AUSTPAC gateway charges only for network activity and response is dictated only by response of called host and response of intervening networks.

3. The AUSTPAC gateway has a 4800 bps network connection thus much faster type-out is possible from the AUSTPAC gateway than from the MIDAS program.

Arthur Hartwig
extension 4079

3. International Access from AUSTPAC Gateway

The AUSTPAC gateway has recently been enhanced to account for calls to international sites. Many of the sites connected to overseas public data networks are now accessible through the Computer Centre's AUSTPAC gateway.

To access an international site, the user must first establish a gateway account and request international access privilege. (By default, gateway accounts do not have the international access privilege).

This may be done by sending a mail message on the KL-10 to "NETWORK" giving the desired gateway password (if it is a new account) and indicating whether or not international access is required. Note that all gateway usage is charged to a KL-10 ppn. Your mail message should also state that the gateway usage has been approved by the Head of your Department.

The gateway has a directory of names of known sites. Users can request additions to the directory by sending mail to "NETWORK" and giving the full X.121 address of site. Note that the Computer Centre is unable (in general) to find out the address of any particular site - if you want to use an external computer it is up to you to find out how to get there.

Further details on using the AUSTPAC gateway can be found in the file DOC: AUSTPAC.MAN and in Newsletter N-286 (5-Dec-83).

Charges for the AUSTPAC international service are 20¢/minute (in units of 1 minute) and 60¢/1000 characters (chargeable units of 1000 characters in each direction). The gateway accounting is based internally on chargeable units of 0.55¢/minute and 0.09¢/segment (AUSTPAC charges) so for international access these charges are multiplied by 37 and 67¢ then rounded up to the next cent and added together. Figures for segments sent and received are computed by rounding up characters sent and received to the next thousand then dividing by 10 (i.e. for international access segments are considered to be units of 100 characters).

The call statistics displayed at the end of the call will be those calculated on this basis.

Thus a call which lasted 1 min 37 secs, sent 470 characters and received 3784 characters will be charged as follows:

1 min 37 secs, charged 2 minutes,
2 x 0.55¢/min * 37 (factor for international access)
= 1.1 * 37 = 40.7 charged 41¢

470 and 3784 characters charged as 1000,4000
10,40 segments = 50 segs * 0.09¢/seg * 67
= 301.5¢ charged \$3.02

Arthur Hartwig
extension 4079

4. International Mail and File Transfers

With the enhancement of the AUSTPAC gateway to support charging for international access it is now possible to send mail and send or receive files from computers connected to public data networks (X.25) provided these computers run implementations of the protocols agreed upon by the UK academic and research community.

For further information contact me or send your questions via KL10 MAIL to NETWORK.

Arthur Hartwig
extension 4079

5. Application of Computers in the Chemistry Department

The following article, provided by the Chemistry Department, describes a number of applications of computers within that department. Access into the University Network is obtained via one of their PDP-11's running the RSX-11M operating system and DECNET. As described further below, the PDP-11's provide the ability for instrument control, and application programming for the analysis of any recorded data. DECNET provides access to the Communications Network for Virtual Terminal Support and file transfers.

The Application of Computers in Instrument Control and Data Acquisition and Treatment in the Chemistry Department

Computers in the Chemistry Department are used to control instrument conditions, to act as data acquisition devices, to process the acquired data or to provide a library of recorded information. In some cases the computers are dedicated devices forming a permanent part of the instrument, while in other cases they perform a multipurpose role. The two Chemistry Department's PDP 11/34's, for example, fall into the latter category.

In presenting this list of applications of computers in Chemistry we have chosen to present the information in terms of the major instrumental techniques rather than in terms of the specific application of the various computers to be found within the department.

1. Perkin Elmer Model 560 Surface Analysis System

This system combines the SIMS and ESCA techniques for chemical analysis of surfaces. The instrument is fitted with a dedicated PDP 11/34 computer system to control and monitor instrument conditions, to collect, process and survey spectra, and to perform a range of additional data manipulations such as data smoothing, deconvolution and integration. The computer will function in foreground and background modes, so that a spectrum can be acquired while others are being processed. The operating software was supplied by the manufacturers of the instrument.

2. Jeol FX-100 FT Nuclear Spin Resonance Spectrometer

This fourier transform NMR spectrometer is interfaced directly to a dedicated Texas 980B computer. The computer controls the instrument conditions, stores the acquired data on a Diablo hard disk and processes the data to provide a conventional NMR spectrum. The computer operates in foreground and background modes when acquiring and processing data. At some time in the future we hope to link this instrument to the central University computer to facilitate addi-

tional data processing. The operating software was supplied by the instrument manufacturer.

3. Bruker ER-200D Electron Spin Resonance Spectrometer

The spectrometer is interfaced to the Department's PDP 11/34 computer system. A microprocessor within the instrument controls the instrument conditions, and the 11/34 unit is used for the acquisition, storage and processing of spectral data. The PDP 11/34 computer can also operate in a multiscan mode to allow for the accumulation of multiple scans to improve the signal to noise characteristics of a spectrum. The software packages for data processing were written by members of the department and they allow for spectral integration, simulation, fourier transform analysis and other data manipulations.

4. Hewlett Packard Gas Chromatograph/Mass Spectrometer. Model 5992B

The GC/MS instrument provides information which allows the identification and quantification of organic compounds. A Hewlett Packard Model 9825B dedicated computer controls the instrumental operating conditions, and also performs a data acquisition role. In addition, the computer provides for some data analysis and has a limited facility for an information library. This library can assist in compound identification. The software to drive the instrument was provided by the manufacturers.

5. Varian AA-875 Atomic Absorption Spectrometer

This instrument allows elemental analyses to be performed accurately and rapidly. It is interfaced to a dedicated Hewlett Packard 85 computer which controls the instrumental conditions for analysis and also the acquisition and processing of the spectral information, providing a detailed elemental analysis for the sample. The operational software was provided with this instrument.

6. Hewlett Packard 8450A UV/Vis Spectrometer

This diode array spectrometer provides information concerning the absorption of electromagnetic radiation in the UV and visible regions. It has an inbuilt microprocessor fitted with an 82901M floppy disk drive and 7225B plotter. The software for the microprocessor, which provides for multicomponent analysis and storage of data, was provided with the instrument. Provision is also available for interfacing the instrument to an external computer.

7. Waters Associates Liquid Chromatograph

This instrument is used to measure the molecular weights of polymers. In order to facilitate the processing of the experimental information it has been interfaced to an Apple IIe computer via a special interface unit built in the Department. All the software necessary to drive the data acquisition routines and to process the experimental information was written by members of the Department. The data analysis provides information about the molecular weight and molecular weight distribution of a polymer sample.

8. Cary 82 Raman Spectrometer

This instrument was purchased with encoders to allow intensity and wavelength information to be read out. It has now been interfaced to the PDP 11/34 unit using an Apple II for preliminary data treatment and as buffer storage. The spectral information is massaged on line in a number of ways. Instrumental control is not carried out through the computer. The computer software was written in the Department.

9. Low Energy Light Scattering Spectrometer

This has a Nicolet 1020 spectral computer dedicated to it. Data collection and some spectral manipulation are carried out on line. The system has been further interfaced to an Apple II unit which is used for instrument control and as a data transfer interface to the PDP 11/34.

10. Perkin Elmer 283-B Infrared Spectrometer

This is fitted with buffer and interface and communicates with either an Apple II or the PDP 11/34. The instrument can be controlled through the external computers and data collected can be stored and manipulated on either of the two external computers.

11. Varian-Techtron DMS 90 UV/Visible Spectrometers

These two instruments, which are controlled by inbuilt microprocessors, are fitted with IEEE and RS232 interfaces to allow linking to external computers. Software is provided by the manufacturers to facilitate data acquisition on an Apple IIe computer and to allow for data storage and manipulation. These two instruments are used extensively in undergraduate teaching.

12. TX-5 tunable CO₂ Laser

This is currently being interfaced to an Apple II to enable automatic tuning of the laser to preselected frequencies. Control will involve the manipulation of stepping motors, voltage ramps on piezoelectric stacks and calibration comparison using internal standard samples. The data collected using the laser will also be stored and manipulated on the computer.

12. High Sensitivity Raman Spectrometer

This instrument is currently under construction and will be fully computer controlled. Scan control, data recording and data storage will be accomplished on the unit. Initial interfacing will be done using an Apple II for which we have some experience. This will later be replaced by a larger unit, possibly the IBM 95000 lab computer.

Geoffrey Dengate
extension 3391

6. File Transfers between the IBM 3083 and UQVAX::

For those people who want to move files between the IBM 3083 and UQVAX::, and for those astute system and network watchers who have found and tried to use the software, it is time to describe in some detail what can and cannot be done.

We have obtained a software package called JNET from Joiner Associates, Inc. in the USA. This software operates under VAX/VMS, and provides a basic level of information transfer between the VAX/VMS system and an IBM system running Remote Spooled Communications System (RSCS).

The JNET software provides the following services:

- message exchange between logged-on users
- file transfer
- electronic mail
- do simple enquiries of the other system

How an IBM User Sees It

A user working on the IBM VM/CMS system would receive mail and files from a VAX/VMS user in his virtual reader as he would receive files from an IBM user.

A message can be sent to the terminal of a logged-on VAX/VMS user (e.g. VAXFRED) by using the TELL command, e.g.

```
TELL VAXFRED AT UQVAX TIME TO GO HOME FRED<enter>
```

If user VAXFRED is not logged in, the sender will be notified.

To send a file from IBM VM/CMS to VAX/VMS is tricky. DO NOT try using SENDFILE EXEC. JNET cannot cope with it. Files can only be sent using the PRINT or PUNCH commands after TAGging the PRINTER or PUNCH devices. So to send a file PLOT FORTRAN from VM/CMS to VAX user VAXFRED, a user would need to type the following:

```
CP TAG DEV PUNCH UQVAX VAXFRED
CP SPOOL PUNCH TO RSCS
PUNCH PLOT FORTRAN
```

Files that are PUNCHED are restricted to 80 byte records. Files that are PRINTed are restricted to 132 byte records and pagination is performed as per the LINECOUNT parameter to the PRINT command.

Electronic mail is a special case of file transfer, with all the limitations as mentioned above. So use NOTE EXEC to prepare your mail, making use of any NAMES files you may have. Then instead of SENDING it, FILE it. Its name will be <IBM username> NOTE, e.g. IBMFRED NOTE. Then PUNCH the file to the appropriate user(s) as if it was a file transfer.

File transfers are spooled, and therefore may not go immediately. This does have the advantage though that the VAX does not have to be available to initiate the transfer.

How the VAX User Sees It

On arrival at the VAX, the file is translated from EBCDIC character set to ASCII character set as best it can. Be careful of the following characters:

[N]{}~

These seven characters will most likely be converted to double quote when transferred to the IBM. The file is moved into a transit area which has a logical name JAN_FILES:, and is set to be owned by the destination user (i.e. it gets counted toward his disk usage quota). A mail message is sent to the user via normal VMS MAIL specifying where the file originated from, and what it is now called. From our example above, the file would be stored as PLOT.FOR. The file should then be renamed into the user's directory (if it is on the same disk - DSKB:) or copied to the user's directory and deleted from JAN_FILES: (this can be done since the user owns that file in that directory).

Note: Please collect your files from the transit area promptly - otherwise we will need to decide on a time limit for unclaimed files. If you do not have a file storage quota on DSKB:, you will be charged excess storage rates.

One more thing to watch: VM/CMS only deals in 8 character user names, and VAX/VMS allows 12 characters. The JNET software scans the accounting file to return the first entry to match on 8 characters. So if your VAX username is not unique up to 8 characters, BEWARE! You may not get what should be coming to you.

To send files from VAX/VMS to IBM VM/CMS, the SEND command has been introduced. To send a file PLOT.FOR to a user IBMFRED on the IBM type,

SEND/FILE file spec[,file spec] node username

e.g. SEND/FILE PLOT.FOR UQVM IBMFRED

This file will appear in his reader list. Now, be careful! If there are any records longer than 80 characters, they will be split, and there will be no indication of which lines got the knife without visually checking it – provided, of course, you know what your file should look like.

A message can be sent to a logged-in IBM user's terminal by using the command,

SEND/REMOTE node username ["message"]

e.g. SEND/REMOTE UQVM IBMFRED "Time to go home, Fred".

Simple inquiries can be made of the IBM system by using the command,

SEND/COMMAND node ["command text"]

e.g. SEND/COMMAND UQVM "CPQUERY NAMES"

Electronic mail can be sent using the normal VMS MAIL utility, addressing the mail to GATEWAY:: "usernodel", e.g. GATEWAY::"IBMFREDUQVM". The mail will appear in his virtual reader.

Assistance with these commands and the many other sub switches can be sought on the VAX by typing:

\$HELP SEND<cr>

This is by no means the end of the story. Moves are afoot to remove as much as possible the restrictions on file structure and to improve the delivery system on the VAX/VMS system. So watch for the next installment.

*Bryan Claire
extension 4078*

7. IBM Printer Output for GRIFIN Users

A procedure has been prepared for VAX/VMS to allow IBM VM/CMS users to have their printer output channelled through to the Data Products printer at the Griffith Batch Station, otherwise known as LPT500.

To direct output to this printer, IBM VM/CMS users need to issue the following two commands once after logging in before issuing any PRINT commands:

```
CP TAG DEV PRINTER UQVAX GPPRINT
CP SPOOL PRINTER TO RSCS
```

An appropriate place to do this would be in their PROFILE EXEC if they expect to use this printer all the time. Thereafter, all print requests will result in the files being printed at the Batch Station in Sciences II Building during the scheduled VAX/VMS printing times.

*Bryan Claire
extension 4078*

8. Information Concerning Courses

Below is the schedule of courses for the period July-October. (Where necessary, ad-

ditional courses may be added to the list.)

Note: regarding the courses "Introduction to IBM" (4 half days) and "Conversion to IBM" (3 half days):

The "Conversion" course is directed at users with familiarity of some computer system (e.g. PDP-10) and who now wish to make use of the IBM system; the "Introduction" course is intended for new users with no previous computing experience, i.e. it corresponds in function to the "Introduction to PDP-10" course.

One of the two above courses should normally have been completed before attending either the SQL course or the SCRIPT course (just as the "Introduction to PDP-10" course is required before attending courses on PDP-10 packages).

July

Elementary FORTRAN Programming	July 16-20 5 full days 9-12 + 1-4
Introduction to PDP-10 (GU)	July 17-20 4 half days 9-12 each day
Introduction to IBM (GU)	July 17-20 4 half days 1-4 each day
Conversion to IBM	July 24-26 3 half days 9-12 each day
Introduction to PDP-10	July 23-26 4 half days 1-4 each day
SQL	July 30-August 2 4 half days 9-12 each day

August

SCRIPT	August 6-9 4 half days 1-4 each day
Elementary BASIC Programming	August 7-10 4 half days 9-12 each day
Introduction to PDP-10	August 13,14,16,17 4 half days 9-12 each day
Introduction to IBM	August 13,14,16,17 4 half days 1-4 each day
Conversion to IBM	August 21-23 3 half days 1-4 each day
Introduction to IBM	August 27-30 4 half days 9-12 each day
Introduction to PDP-10	August 27-30 4 half days 1-4 each day

September

Conversion to IBM	September 3-5 3 half days 9-12 each day
CAD/CAM	September 3-6 4 full days 9-12 + 1-4

1022	September 10-14 5 half days 9-12 each day
Typesetting	September 10-13 4 half days 1-4 each day
Introduction to IBM	September 17-20 4 half days 9-12 each day
SPSS	September 17-21 5 half days 1-4.30 each day
Conversion to IBM	September 24-26 3 half days 1-4 each day
TECO Editing	September 27 1 full day 9-12 + 1-4

October

Introduction to PDP-10	October 1-4 4 half days 9-12 each day
SQL	October 8-11 4 half days 9-12 each day
Introduction to IBM	October 8-11 4 half days 1-4 each day
RUNOFF	October 15-18 4 half days 1-4 each day
Conversion to IBM	October 16-18 3 half days 9-12 each day
SCRIPT	October 22-25 4 half days 9-12 each day
Introduction to PDP-10	October 22-25 4 half days 1-4 each day

Notes:

1. All of the above courses will be held in Room G13A – Hawken Building (except for those designated GU).
2. Enrolments for all courses may be made by phoning extension 3018.

Barry Maher
extension 3021

9. Departmental Equipment for Sale

1. PDP 11/03 system, Kev 11 Floating Point, 24 Kb RAM, RX01 Floppy Disc Drives, 2 x DLV 11 serial lines, Large Cabinet.
2. RK11 Unibus controller for RK05 disc drives.
3. 1 x RK05 f 5 MB fixed disc drive.
4. 1 x RK05 j 2.5 MB removable disc drive.
– above items have been fully maintained by P.C.C.
5. 27 x RK05 Disc Packs mainly 3M brand. All are Error-Free.

6. Complot DP101 A3 size Flat-bed Digital plotter. 0.1 mm Resolution, Serial Interface, Pens: Felt Tip, Ball Point and Indian Ink, Software Compatible with Calcomp Fortran Library.

Contact Cameron Davidson, Department of Mining and Metallurgical Engineering, ext. 2051.

Maralyn Kenley
extension 3938

STOP PRESS STOP PRESS STOP PRESS

The PCP 11/57 is here!! And the PCP 11/107 is on the way! Congratulations to the ISF (In Silicon Fertilisation) team working at the Prentice Computer Centre. The team has just announced the birth of the PCP 11/57 (PCP = Prentice Centre Processors). The 11/57 is the result of pioneering genetic engineering experiments to cross a PDP11/34 UNIBUS system and a PDP 11/23 QBUS system.

The resultant PCP 11/57 breaks the 256 Kb memory limitation of the PDP 11/34 while retaining the investment in Unibus peripherals. Up to 4 Mb of memory is usable with the system and the mechanism is software transparent to all the current software (both O.S. and application).

Now that we have the technology and know how the next step for the ISF team is to use an 11/73 CPU in place of the 11/23 CPU. Vista! A system at least equivalent to PDP 11/44, the PCP 11/107 (11/73 + 11/34).

Some answers to the questions most asked of the ISF team:

- Q. Will it cost an arm and a leg to upgrade?
- A. Well, yes and no. For approximately \$9,500 the ISF team can supply and install an 11/73 CPU, 0.5 Mb memory and all other required equipment. In fact, we will even supply a licence for RSX-11M PLUS (to make the most of the 11/73's separate I and D space).
- Q. Are there any groups with moral objections to this [ISF] concept?
- A. No, the Prentice Computer Centre will continue to support all software and hardware as before. Maintenance charges are expected to remain unchanged.
- Q. How much extra performance will a PCP 11/107 give me relative to the PDP 11/34?
- A. About 2 to 2.5 times the processing speed with enormous gains in throughput because of the reduced swapping ratio due to the larger memory.
- Q. What is the cost of additional memory?
- A. Currently \$2,000 for 0.5 but this is expected to drop in the future.
- Q. What new facilities are available?
- A. Networking will improve significantly. Previously the memory limitations of PDP11/34s restricted network use. The ISF team is currently investigating ETHERNET controllers. Current costs are in the order of \$5,000 for a controller but it is hoped that an ETHERNET hookup and controller will shortly be available for \$1,500. (ETHERNET is a 10 Mbit/sec co-axial network system).
- Q. Why is networking important?
- A. Networks via ETHERNET will allow users to efficiently transfer files to/from other systems, use shared facilities such as disk servers, print servers and so

on, and access other systems (departmental and central).

Q. What is a disk server?

A. Now that you have the power of an 11/107 you will want to do increasingly more work with it. This means you will require more disk space. Rather than purchase a larger disk drive, you store files on a special super large disk system run by the Prentice Computer Centre. Transfer of files is via the ETHERNET and should not be noticeably different in performance than using local disks.

Q. Will there be a charge for this?

A. Yes, there will be file storage charges but you save on backup devices and disk packs, maintenance charges (and, of course, the capital cost). Also you are not constrained to a limited storage size. You use only what you require, when you require it.

Q. Where do I get more details of this amazing offer before its too late?

A. Ring Geoff Dengate on extension 3391.

Colin Lythall

