

PRENTICE COMPUTER CENTRE

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



MINI-MICRO NEWSLETTER

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1.0 EDITORIAL

The previous editor of this newsletter, Arthur Hartwig, is on extended leave of absence at York University and I have taken his place as editor. All correspondence and other articles should now be addressed to:

The Editor
Mini/Micro Newsletter
Prentice Computer Centre

I hope to promote this newsletter as a forum for matters relating to mini and micro computers and not merely a publication of Centre policy and services.

To this extent I requested David Yates of Botany to write an article which is presented here unabridged and unedited. I would like to encourage anyone with an interest in this area to contribute articles, letters or suggestions. (Those users I know of will be receiving personal invitations).

This is a rapidly expanding area in which the University as a whole has little experience as yet and no doubt some of our (the Centre's) and your decisions will be good and some not so good. However, I believe that we can achieve the best overall result by co-operative development and the only way to achieve this is via various forums; this newsletter and the Mini/Micro Users Group. There is no doubt that the University has benefitted from standardisation, bulk purchasing agreements and central maintenance. I also believe that this should not be inhibiting. Therefore, I would like to see an active use of this newsletter.

Further topics I wish to cover in the next newsletter are LABPAK and the new Sanders Media 12/7 word processing printer. I would like to receive any suggestions for topics.

If you are not on the mailing list for this newsletter and have a particular interest in this area, please write to the editor.

Graham Rees
extension 3288

2.0 MAINTENANCE OF DEPARTMENT MINICOMPUTERS

The Centre is currently reviewing its charges in this area, having regard to economies of scale, advances in technology and a better knowledge of the costs of providing these services. The Director of the Computer Centre recently circularised Departments indicating that the new costs for 1981 on average, may be slightly lower than for 1980. These costs are subject to the approval of the Finance Committee and Senate and will be published as soon as possible.

Graham Rees
extension 3288

3.0 UNIX SOFTWARE

In previous newsletters (No. 3/78 and No. 5/78) reference was made to the availability of the Unix Operating System from the Prentice Computer Centre. It was pointed out that there were certain formalities to be met in respect of the Licence Agreement with Western Electric Co. (the owners of UNIX) and it was requested that Departmental Heads should write to the Director if they required a licence and distribution of this Software.

I should bring to your attention that UNIX may only be used on a designated CPU with approval of Western Electric. The University licence agreement has been executed under the University Seal and has very strict definitions on the uses which conform to the provision of a 'free' licence. Failure to use UNIX in conformity with the agreement could jeopardize the University's licence. Please let me know if you have any problems or require further information.

Apart from the strict limits placed on the allowable use of UNIX, there can be other problems in the environment of the University. Not the least of these is that the Centre does not have the resources to fully support UNIX in addition to the standard digital software products. You will note in a previous section of the Newsletter, the communications facilities now available through the Digital RSX-11 system. UNIX does tend to be a somewhat more flexible operating system and whilst this may have advantages in some circumstances, it also has disadvantages in terms of development of overall University standards and support.

Director
extension 2189

4.0 NEW NETWORK FACILITY

The following article is reprinted from a recent Computer Centre Newsletter. It details the Communications Network facilities available to all PDP11 users running RSX11 or RT11 operating systems:

A new facility is now available which allows RSX-11 systems to be connected to the network and to communicate with the other computers already on the network. The facility is implemented by connecting the RSX system to a special PDP-11 node via a TELECOM line and adding special network software to the RSX operating system.

The PDP-11 node is named RSXANF and appears in the list of active nodes provided in response to a NODE command to the KL10 or KA10. RSXANF is a standard DEC DN80 series node but with extra software written by the Centre to support the new facility. When an RSX system is connected in this way it appears to the network as another standard network node and is known to the network by the node name and number which is assigned to it. eg - CHEM (41).

With the new facility, a user on any terminal attached to the RSX system may connect to the network and log in to either the KA10 or KL10 provided he has a normal user account on the target machine. After he has logged in to a DEC10 he may do any normal DEC10 work, but in addition he may transfer files between his system and the DEC10 and he may direct line printer output from the DEC10 to his local RSX printer.

The RSX user may also connect to the OTC's MIDAS service and will shortly be able to connect with the CSIRO network. If any RSX users are interested in connecting to other RSX systems via the network then that facility can be provided also by arrangement with the Centre.

The same set of facilities are currently being developed for RT-11 system users though on a somewhat reduced scale.

For users who wish to implement the facility the Centre will provide the required software and arrange the necessary TELECOM connection.

The software consists of the standard DECnet network software plus special tasks VTY, NETLPT and FAL. VTY provides the DEC10 virtual terminal access, NETLPT provides for network print spooling and FAL allows file transfers.

4.1 Virtual Terminals.

The RSX task VTY is invoked by means of the LOGIN command, eg-

>LOG <cr>

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VTY will then initiate a connect to the network which will normally result in the user being connected to the KL10. He may then log in on the KL10 or SET HOST to connect to another host. In any case, INITIA will be run on the DEC10 to which he is connected and the normal identification information will be typed, eg, -

```
Prentice KL 603A #23 14:39:22 TTY137 system 1189
Connected to Node RSXANF(24) Line # 3
Please LOGIN
```

To return to the RSX system the user should log off the DEC10 and then type the control character <GS> which is output by <control-]> on most terminals.

For further details, users are referred to the DEC10 HELP file on VTY which may be obtained by typing -

```
HELP VTY <cr>
```

or

```
PRI HLP:VTY.HLP <cr>
```

4.2 File Transfers.

To perform file transfers between the DEC10 and the RSX system, the the DEC10 program ACCESS and the RSX task FAL are used. File transfers are invoked only from the DEC10 and only to and from the RSX system from which the user is logged in.

ACCESS will transfer ASCII files without any problems but other types of files such as object files or files with FORTRAN carriage control characters may not work or may require some special combination of switches. In short, if binary files are to be transferred, advice should be sought from the Centre on how best to proceed.

For further details on using ACCESS, users are referred to the DCE10 HELP file on ACCESS which may be obtained by typing -

```
HELP ACCESS <cr>
```

or

```
PRI HLP:ACCESS.HLP <cr>
```

4.3 Network Spooling.

For output to be directed to the RSX printer it is necessary for a DEC10 spooler to be running and communicating with the RSX task NETLPT. Then the simplest way to direct output to the local printer is to type the standard network command -

LOCATE (node number) <cr>

and thereafter all PRINT commands will cause output to be spooled to that node. The DEC10 spooler will not start sending output however if the RSX spooler has control of the printer. When the RSX spooler has finished it should normally relinquish control of the printer.

Because of the (so far) intermittent requirement for network spooling the DEC10 spoolers for other than the central printers are not normally running. However, RSX node users may ring the Centre's Supervising Operator and request that a spooler be started up. A spooler could be run on a more regular basis if the demand warrants.

4.4 CLINK

For some time now similar facilities have been available via the DEC10 program CLINK and associated RSX modules (Newsletter N229, MAY 1978) so some comparisons between CLINK and ACCESS/VTY are warranted.

CLINK uses the DECnet error free link protocol DDCMP but it is implemented as user level code which adds to the machine cost to users. ACCESS uses the same protocols but they are part of the standard system/network software for which users are not directly charged. ACCESS costs are around half those of CLINK. ACCESS is also potentially cheaper and faster than CLINK on error prone lines because all the retransmissions are done by the network nodes (eg, the DN87) and not the DEC10 as is the case with CLINK.

CLINK operates with the RSX/RT system connected over a standard terminal lines to the DEC10, therefore a user can connect his PDP-11 or a terminal to the line as the need arises. ACCESS/VTY on the other hand requires that the PDP-11 be connected to the network via a dedicated DECnet line which cannot be used for an ordinary terminal; terminal access to the DEC10 is therefore always via VTY.

CLINK will only allow one virtual terminal to run at any time and then only if the terminal is interfaced to the PDP-11 via a DL-11. ACCESS allows multiple virtual terminals using DL-11, DZ-11 or DH-11 interfaces.

The choice between the two systems depends upon the users requirements. Probably, with small RT-11 systems with occasional need for file transfers, CLINK is more appropriate.

4.5 Line Speeds

The speed of the line connecting the PDP-11 to the network is of some concern. Most terminal lines on campus run at 300 bits per second which is appropriate for many hardcopy terminals. Many video terminals will run a good deal faster, but are usually run at 300 bps also because the lease costs for TELECOM links increase rapidly with speed.

It is technically possible to connect PDP-11's to the network at 300 bps but it is not recommended as a practical proposition. There are two aspects to the problem:

Firstly, the terminal performance when connected to the DEC10 via VTY may be unacceptable with the 300 bps line. This is because the DDCMP protocol requires the insertion of about twenty extra characters per line typed in or out of the terminal. At 1200 bps this is generally not a problem. CLINK does not use DDCMP for normal terminal operations but the response at 300 bps is still not as good as for a directly connected terminal.

Secondly, transfers of large files can take too long at 300 bps, especially on an error prone line. What is "large" or "too long" of course depends on individual requirements and we are happy to discuss the matter with users.

4.6 Communications Interfaces

An additional communications interface may also be required for the PDP-11. Connection at 300 or 1200 bps requires a DL-11. Connection at 2400 bps and higher requires a synchronous interface such as a DUP-11. A DL-11 costs around \$700 and a DUP-11 costs about \$1300. However the Computing Policy Committee has allocated some funds specifically for the purchase of communications interfaces to facilitate connection of departmental minicomputers to the network.

Persons who are interested in any aspect of connection of PDP-11's to the network are invited to ring me in the first instance.

John Barker
Extension 3016

5.0 MICROCOMPUTER SYSTEMS

The Computer Centre is committed to support both the SORCERER and APPLE II microcomputer systems. These systems were not selected as the "best" from an exhaustive examination of microcomputer systems available at present. Rather these have become defacto standards; the SORCERER from a project in the Department of Computer Science and the APPLE because of its use in the educational field. Both machines have their advantages and limitations so care should be taken in selecting either computer for any application.

In their standard form neither system is designed to operate as an intelligent terminal, rather they are stand alone microcomputers. Their usefulness however, can be improved if they can become part of the campus network.

The SORCERER contains a ZILOG Z80 microprocessor for which we have complete development tools. Therefore, we can undertake quite fundamental software modification and development to improve the SORCERER's usefulness. On the other hand, the APPLE contains a Rockwell 6502 microprocessor for which we have no development tools. Therefore, we can only expect to write user level programs, for example, in BASIC or PASCAL, or make use of other standard software.

The SORCERER has the nice facility whereby its functionality may be extended and varied by the mechanism of ROM packs. The basic SORCERER contains a small simple monitor which resides permanently in internal memory. ROM packs contain various programs which extend the functionality of the basic monitor when plugged in. For example, the BASIC language is supplied in a ROM pack. Other standard ROM packs include a work processing program and a Z80 assembler development system.

The SORCERER uses an audio cassette for local storage files. Neither of the brands available from the supplier have proved to be reliable enough for the University's requirements. However, a cassette deck supplied by Superscope (Qld) P/L, the Marautz Model C-200LP, has so far performed excellently. We believe that this cassette will also be suitable for the APPLE. A detailed report is included in this newsletter.

The Centre is currently developing new software to make the SORCERER into a useful intelligent terminal. There will be a new monitor program and a new ROM pack to facilitate off-line text file preparation. The SORCERER will then perform the following functions

- run as a standard video terminal
- allow creation and editing of text files, which may be stored on the local cassette
- permit file transfers between the SORCERER and the KA10 or KL10

- provide for a local printer to print SORCERER files
- still run BASIC using the SORCERER's standard BASIC ROM pack

In order to use the new monitor software, the SORCERER has to have a minor hardware modification which is necessary to allow it to run properly as a terminal. This modification would normally be done as standard to SORCERERS bought through the Computer Centre.

The new monitor will be available as two 1K byte ROMs to replace the standard SORCERER ROMs. The text preparation ROM will be available ready to plug in.

To support the file transfer function we are developing some software for the DEC-10. This software will exploit a so far unused facility in the KL10 which is designed for efficient communication with intelligent terminals.

We have just purchased our first APPLE in the Centre so we are not very far up the learning curve as yet. Generally the APPLE software appears more sophisticated than the SORCERERS and there is a wide variety of peripherals readily available which may make the APPLE more suitable to general computing.

We do not see at this stage that any hardware modifications will be necessary and we expect to provide software to allow the APPLE to be used as a terminal to the KA10, KL10 or any PDP11 and to permit file transfers between the APPLE and the KA or KL10.

5.1 Current Status

SORCERER

The new monitor and text ROM pack are not finalised as yet. We expect to be able to make first deliveries later in the year. This option can be retro fitted to the current model SORCERER.

The Centre will process orders for the standard SORCER now and retro fit the new monitor later if required.

APPLE

The 'Intelligent Terminal' software is not available as yet. Also it is not clear what software (other than provided as standard with the APPLE) the Centre will be providing.

The Centre will process orders for the APPLE now.

Graham Rees
extension 3288

6.0 MICROCOMPUTER MAINTENANCE

Currently the Centre offers only a full maintenance service contract for certain minicomputer systems and terminals. We periodically review our charges having regard to economics of scale, new technology and improved working knowledge in order to keep charges to a minimum. As a general policy, we try to provide "extras" as part of this maintenance hopefully so that the University receives maximum benefit from its investment. For example, terminals are always thoroughly cleaned, inspected and all adjustments checked during any service; we often perform 'hand-holding' for new users and don't complain too much over user finger problems; if possible we lend a replacement terminal particularly when a user stresses some pressing need; and there are many other examples.

We are not particularly asking for a pat on the back, I wished to explain that our service is not just WBTM (wham bam thank you maam).

The largest part of our service costs are in labour, not just in servicing but in travelling and extra time.

In order to reduce costs we are introducing a new 'Return-to-Centre' service. This service will not be available on all equipment (obviously). The first items will be the SORCERER and APPLE microcomputer systems. The general conditions of service will be as follows.

- The item must be returned to and picked up from the Centre and full details given of the problem.
- The equipment will be serviced as time permits (after full maintenance service) however, the equipment will be examined and repaired within 5 working days (parts availability permitting).
- This contract will not cover replacement of components and modules or subsystems which may have a short life span.
- Warranty claims for users who elect for this type of service will also be return to Centre.

- If the defective subsystem can be isolated only that subsystem need be returned to the Centre.

Graham Rees
extension 3288

7.0 SORCERER MICROCOMPUTER

7.1 Purchasing

The following hardware items are available through the Centre:

SORCERER II, 16K RAM	\$1395.00
SORCERER II Video Monitor	\$149.50
SORCERER Cassette Cables	\$34.50
Superscope Cassette Recorder C-200LP	\$50.00
U of Q Monitor (installed)	\$100.00
U of Q Intelligent Terminal PAK	<u>\$150.00</u>
* SORCERER Microcomputer Model 1	\$1879.00
Development System PAK	\$139.50
PCC installation fee (does not apply if user picks up equipment from Centre)	\$20.00

* You may order this system as one item.

7.2 Maintenance

There will be two types of maintenance coverage on the SORCERER. The prices are for a Model I SORCERER.

Return to Centre	\$50.00
Full coverage	\$150.00

Prices for other systems on application.

Graham Rees
extension 3288

8.0 APPLE II MICROCOMPUTER

8.1 Purchasing

The following APPLE hardware is available through the Centre.

APPLE II plus 48 K RAM	\$1400.00
3270 Monitor	\$110.00
3204 Floppy Disc Drive and Controller	\$690.00
3203 Floppy Disc Drive	\$590.00
3112 RS232 Serial Interface	\$230.00
3553 Pascal Language System	\$545.00
APPLE II Model 1	\$3565.00
Superscope Cassette Recorder C-200LP (Cassettes are available from the Union Calculator Shop)	\$50.00
Floppy Discettes (box of 10)	\$50.00
PCC Installation Fee (does not apply if user picks up equipment from Centre)	\$20.00

Other interfaces and items are available POA however, we have not examined these in detail yet.

8.2 Maintenance

There will be two types of maintenance coverage on the APPLE. The prices are for an APPLE Model 1, prices for other systems or additional items on application.

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Return to Centre	\$80.00
Full coverage	\$180.00

Graham Rees
extension 3288

9.0 CASSETTE RECORDERS FOR MICROCOMPUTERS

The original cassette recorders supplied for use with the SORCERER have proved to be unreliable when used for digital recording and replay. A suggested replacement, the National Panasonic RQ-2133 has also been unreliable when used in this application.

A small cassette recorder, the Superscope C-200LP, has been found to give superior results.

Ensuring correct interface levels between the SORCERER and the cassette recorder will result in more reliable recordings being made. The SORCERER output level at the socket labelled MIC is 40 millivolts pk/pk and is suitable to feed to the AUX input on the cassette recorder, C-200LP. The output level of the tape recorder needs to be about 250 millivolts pk/pk to provide sufficient input for the SORCERER to adequately recover the digital information.

Setting the C-200LP volume control to '5' should in most cases provide the necessary input level to the SORCERER.

Recording and subsequent replay should be checked at 600 Hz and 1200 Hz for 1200 baud communications; 1200 Hz and 2400 Hz for 300 baud. The cassette tape to be used for recording should be fully erased initially, so remnants of earlier recordings are not present. This can be achieved by running the tape through in RECORD mode but having NO INPUT. The C-200LP provides a blank plug to disable the recorder microphone to allow this to be done.

Sequential recordings of data or programs can be very easily made by using the PAUSE button to halt tape motion between recordings. If the recorder to be used only has a MIC input, it may be necessary to fit a level attenuator as described in the SORCERER technical manual. This prevents the input amplifier of the recorder saturating should the input level be greatly in excess of that nominally required.

When choosing a cassette recorder to be used for digital storage, the following specifications should be considered.

1. Frequency response to at least 8 KHz
2. Tape speed at least 4.75 cms/sec
3. AC bias used in the record mode. (Usually 40-8- KHz)
4. AUX input if possible. (Less input overload likely to occur)
5. AC erase if possible. (This will only be found on higher priced machines)

Summary of technical specifications:

STANDARD	SORCERER CASSETTE	RQ2133	C-200LP
Tape speed cms per sec	4.75	4.75	4.75/2.375
Recording system half track mono	yes	yes	yes
Signal noise ratio	---	---	low noise tape:45 dB
Input MIC	yes	0.25mV	0.3mV
Input AUX	no	yes	80mV
Remote start /stop	yes	yes	yes
Recording bias AC	no	yes	40KHz
Record indicator	no	LED	LED
Outputs	SPKE	MON	SPKE, H-PHONES
Motor	DC	DC	DC Servo control
Wow & flutter	0.55%	---	0.17% WRMS
one key record	no	yes	yes
Pause	no	yes	yes
Auto stop motor off	no	yes	yes

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Auto rec
level yes yes yes

Tape posit
counter no yes yes

The C-200LP is available from the Centre at a price of \$50.

Alan Langdon
extension 3942

10.0 TELECOM AND MICROCOMPUTERS

We do not at this stage have Telecom approval to connect either the SORCERER or APPLE Microcomputers to Telecom Modems. These applications have been filed with Telecom and hopefully we will have approval in the near future. However, the approval applied for will require the use of a specified Modem 'Isolator'. The purchase price of this isolator is \$300. The Centre is currently developing an isolator which we expect will cost much less.

Even in cases where there is no requirement for Telecom modems and direct connections to either PDP10 is possible, we will still insist on an isolator being used between the microcomputer and the PDP10. This is for two reasons:

1. The PDP10s are connected to Telecom Modems and we are required to have all equipment connected to these systems approved and
2. For the safety of our own staff and equipment.

Graham Rees
extension 3288

11.0 C COMPILERS ON CAMPUS

It has recently come to my attention that there are several different C Compilers in use on the University Unix systems. It would be beneficial if we could standardize on just one of these. At present I know of three different compilers:

1. Version 6 - We would like to phase this out.
2. Version 7 - We would like to standardize on this one.
3. Portability Version - Compatible with Version 7 but designed to be easily transported to other computers or operating systems.

I would appreciate any feed back on the above observations.

Mark Johnson
extension 3938

12.0 VERSION 4 OF RT-11

Not so very long ago we received from DEC the new Version 4 release of RT-11. Several of the RT-11 sites on campus have been running it for a while now with no reported problems. Version 4 is upwards compatible with Version 3 but has several new features which make it very attractive:

1. Expanded set of Monitor commands and switches.
2. Several new utility programs.
3. A print spooler for queued printer output.
4. System jobs - an extension of the foreground principle.

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If any of the existing Version 3 sites are interested please contact me for further discussion.

Mark Johnson
extension 3938

13.0 RSX FORTRAN VERSION 2.5

We have recently received from DEC a new version of the FORTRAN compiler for RSX. There are no major changes from previous versions, just quite a few bug fixes. Hopefully, we will be able to make this our standard compiler for RSX FORTRAN.

Mark Johnson
extension 3938

14.0 TELECOM AUSTRALIA

As from 1/9/80 Telecom Australia has revised its charges as follows:

Datel Private Lines - Annual Rental

1. Line access fees (includes modems and lines to the local exchange).

<u>Speed of modems</u>	<u>on campus</u>	<u>off campus</u>
300 bits per second	144.00	240.00
1200 bits per second	432.00	720.00
2400 bits per second	672.00	1120.00
4800 bits per second	792.00	1320.00
9600 bits per second	1440.00	2400.00

2. Installation fees.

<u>Speed of modem</u>	<u>on campus</u>	<u>off campus</u>
300 bits per second	168.00	280.00
1200 bits per second	192.00	320.00
2400 bits per second	240.00	400.00
4800 bits per second	276.00	460.00
9600 bits per second	360.00	600.00

The costs shown cover both in and outstation sites.

D.R. Anderson
extension 3166
