By Lloyd R. Borrett

FIRST, an apology: it's March since I last wrote a column, and June since it was published. I promise to try and get this column out on regular basis in future.

So, what has been happening?

My personal highlights have been getting the Melbourne PC User Group on a firm footing; starting up the group's newsletter; upgrading my computer with a 10-megabyte hard disk and dual half-height floppies; bringing on line Australia's first IBM-PC-based bulletin board system; and MELB-PC's stand at the Melbourne PC84 show. As you see I haven't been sitting around doing nothing. Meanwhile, there have been some announcements of particular interest to PC users. The release of Lotus Symphony, Ashton-Tate's dBase III, the IBM 3270-PC, and the IBM Portable, would be those getting most of the limelight.

That gives me plenty to write about, so let's get on with it.

To Symphony, Or Not To Symphony

Is Lotus' new Symphony the greatest thing since sliced bread? Well, if you listen to the gossip and read the reports coming out of the US you would have to think so. Everyone is aware of the success of the first offering from Lotus Development Corp, Lotus 1-2-3, and justifiably so; but I'm just a little bit concerned about the reaction the announcement of Symphony has received.

Now don't get me wrong. I've every reason to believe that Symphony will be a superb product, as good as, if not better than, 1-2-3. But will everyone *need* it.

The success of 1-2-3 was due to the fact that it was the best spreadsheet package available on the IBM-PC. Not only did 1-2-3 have more built-in functions than most other spreadsheet packages, but it was the first to be written to use the features of the Intel 8088/8086 chips at the heart of the PC. The result was a product that out-performed its rivals in almost all categories.

The runaway success of 1-2-3 proved that personal computer users would willingly pay for a product that integrates the main operations they want to perform with their computers. Who wants to mess with a shelf full of software products, each with its own command structure, and to have to pass through an operating system when going from one function to another? 1-2-3 was the clear answer to a major need.

Symphony aims to take the concept further. It strengthens the database functions, and adds telecommunications and word processing. Best of all, it adds 'open slots' that will allow other software to be integrated into the Symphony structure. But could it be too much?

Most users of 1-2-3 are extensive users of the spreadsheet facility. They use 1-2-3 because it's the best spreadsheet. Many complaints have been heard about the 640K memory limit in the IBM-PC restricting the size of 1-2-3 worksheets. A number of users have asked for an expert mode where the 1-2-3 on-line help facility is cancelled and

the resulting extra memory then made available to the worksheet. Do these people need Symphony?

The answer must be no. In order to provide increased functionality, Symphony soaks up more memory in overheads. This reduces the maximum size of the worksheet. Unfortunately, there will be more than one 1-2-3 user who overlooks this and 'up-grades' to Symphony, only to regret it. Upgrading to Symphony means you lose your rights to use 1-2-3.

Consider the situation of the new computer user. Given the press and marketing that Symphony is receiving it would seem to be the only choice. (I wonder how many people held off purchasing 1-2-3, and waited for Symphony.) Many PC users are going to purchase Symphony only to find in a few months time that 1-2-3 was the product they should have had. Will there be an 'up-grade' policy for Symphony users wishing to switch to 1-2-3?

Symphony will be a very successful product, and deservedly so. Unfortunately, it also has the potential to cause much grief if not sold correctly, and I've seen little evidence that it will be. But all is not gloom and doom. The introduction of an Advanced PC, based on the Intel iAPX 286 chip which can handle up to 16 megabytes of memory, is likely to see us asking Lotus to include more functions as standard, and introduce yet another product.

Australia's First IBM-PC BBS

Australia's first IBM-PC-based Bulletin Board System went on line in July. My PC will be enabled as a BBS whenever I'm not using it (that is, most of the time). Electro-Medical Engineering kindly donated a Sendata 2000 auto-answer, auto-disconnect 300-baud modem to the Melbourne PC User Group for use on the BBS. PC Connection Australia provided the telephone line.

The phone number is (03) 528 3750. You need a 300-baud direct-connect modem or acoustic coupler, a telephone line, a serial/asynchronous/communications port, and a program such as PC-TALK III, Crosstalk or MODEM7. I think you'll enjoy the opportunity to ask questions, share tips, and access public domain software in this way. Check out the articles by Bill Bolton and Evan McHugh in last month's issue if you require more information on how to connect to bulletin board systems.

About two megabytes worth of software from the MELB-PC library is available for downloading. Two files are of special interest: the first details how to 'unrestrict' the various versions of Lotus 1-2-3, the other does the same for Symphony.

Public Domain Software

I'm aware of IBM and/or Compatible PC user groups operating in Perth, Adelaide, Melbourne, Canberra, Illawarra, and Sydney. Most of these groups have taken on the task of distributing public domain software to their members. Additions to the Melbourne PC User Group collection include:

CHASM – A cheap assembler.

Finance – A set of BASIC finance programs.

MVP-FORTH – Mountain View Press Public Domain FORTH.

Wordflex – A good word processing program.

Diskcat – Disk cataloguing program.

ASMGEN – An IBM Macro Disassembler.

Genealogy On Display – An excellent genealogy package.

Portworth – A portfolio management system.

These are but a sample of the major items. There are so many great utilities now available, many of which have become such an important part of my everyday command set, that I feel lost when running on a PC without them. And there are more disks coming in from the US all the time.

Many of the more useful files can be downloaded from my bulletin board system, but for interstate users that could become very expensive. I strongly recommend you join a user group and gain access to these disks, as well as all the other valuable services offered.

Avoiding A Hard Disk Disaster

Due to a bug in IBM's FORMAT.COM program, you may get an "ERROR WRITING TO DRIVE C:" message when writing to the hard disk. This is caused by FORMAT.COM marking the wrong locations in the File Allocation Table when it finds a 'bad track' mark on the hard disk.

These patches assume both DEBUG.COM and FORMAT.COM are on drive A. User entries are underlined, the computer responses are not.

Listing 1

```
DOS 2.00
    C>DEBUG FORMAT.COM<return>
    -E 292<return>
    xxxx:0292  7D.73<return>
    -E 316<return>
    xxxx:0316  0B.40<space>   D2.4A<space>
    xxxx:031B  74.7B<return>
    -W<return>
    Writing 1780 bytes
    -Q<return>
DOS 2.10
    C>DEBUG FORMAT.COM<return>
    -E 2DA<return>
    xxxx:02DA  7D.73<return>
    -W<return>
    Writing 1B00 bytes
    -Q<return>
```

Format Without Erasing

In the March column I included a suggestion to help hard disk users avoid having the FORMAT command erase their entire hard disk. Well, Wesley Merchant of the Capital-PC Club, has come up with a better way.

The following patches will force users to include a disk drive designation when using the FORMAT command.

Listing 2

```
DOS 2.00
    A>DEBUG FORMAT.COM<return>
    -A 17B<return>
    xxxx:017B   JMP 160<space>
    xxxx:017D   NOP<space>
    xxxx:017E   NOP<space>
    xxxx:017F   NOP<return>
    -W<return>
    Writing 1780 bytes
    -Q<return>
DOS 2.10
    A>DEBUG FORMAT.COM<return>
    -A 191<return>
    xxxx:0191   JMP 16B<space>
    xxxx:0193   NOP<space>
    xxxx:0194   NOP<space>
    xxxx:0195   NOP<return>
    -W<return>
    Writing 1B00 bytes
    -Q<return>
```

By Bill Bolton

AS I'VE been concentrating on technical material and example programs for a few months, quite a bit of news has built up.

Concurrent DOS

It's been on the cards for some time that DR would make a move to rename the 'Concurrent' product. To reinforce the fact that 'Concurrent' is a very different sort of operating system from single-user CP/M, it's now being called 'Concurrent DOS'. This coincides with the release of PC-Mode for Concurrent.

The initial release of Concurrent DOS for the IBM-PC supports an optional PC-mode, which allows the user to access a wide variety of applications on the IBM-PC and XT. Since Concurrent DOS includes the Graphics System Extension (GSX), it can also support a wide variety of graphic capabilities through standard operating system calls.

Concurrent DOS has been available to OEMs in beta test for some time, and versions of Concurrent for other machines beside the IBM-PC and its close compatibles should start to appear from other suppliers for their hardware soon. Depending on how the system is configured Concurrent DOS can also support windowing capabilities, allowing more than one active program to be shown on the screen at a time. It can be configured to support a single-user or a multi-user microcomputer system and Concurrent DOS and DR NET can be configured to network across multiple microcomputer systems.

OEMs who are implementing Concurrent DOS for a machine have a lot of options open to them in how they configure the system. The memory management partition boundaries are set by the OEM, based on a fixed partition model. A virtual disk in RAM can be created if the OEM wishes. DR recommends that an on-screen status line be provided on all Concurrent virtual terminals, but leaves it up to the OEM as to exactly what goes into the status line. Not all Concurrent DOS systems will offer the same features and facilities, so make sure you ask the supplier exactly what is implemented.

Starlink Turns IBM-PC Into a Multi-user System

Starlink is a new hardware/software package from DR. It allows an IBM-PC to become a five-user system. The package comes with everything you need to add four terminals: the four I/O ports and connectors, the multi-user card and the operating system to make it all run properly. Once connected, all five users may work independently on different applications.

Obviously, unless the terminal is an exact copy of an IBM-PC screen you won't be able to run any software that is specific to the IBM-PC screen. However for many applications, such as word processing or spreadsheets, almost any terminal will do because most programs like WordStar or SuperCalc have installation menus to set up the screen handling.

The users share the same processor, printer, hard disk and, if necessary, the same files.

Working with a multi-user system is not going to give you the same flexibility and capabilities as a network of IBM-PCs, but it will be a lot cheaper than buying four new IBM-PCs and networking hardware. Many applications only need to have some way of sharing the otherwise under-utilised resources of a single PC among several casual users. Starlink on an IBM-PC will certainly give you the same sort of facilities as a conventional terminal-based multi-user system like the ICL PC, with the advantage of at least one user having full IBM-PC facilities.

Starlink is an IBM-PC plug-in board which includes an Intel 8088 microprocessor, 64K of RAM and cabling to an external connector box that has DB 25 connectors for four terminals. It requires an IBM-PC outfitted with at least 512K of RAM. At least five megabytes of hard disk is recommended. It comes with full instructions on how to set the system up. The operating system software behind Starlink is, of course, Concurrent DOS with PC-Mode.

Unix System V Library Undergoing Evaluation

The joint project between DR and AT&T to develop a library of Unix System V software is going well. Software from independent vendors is currently being evaluated. By the end of 1984, Digital Research will be channelling Unix System V software products to the marketplace via OEMs and retailers.

Australian authors of software suitable for Unix System V can request 'Software Screening Forms' by writing to The Unix System V Library, Digital Research, Freepost 2, Clayfield 4011. A question and answer guide included with the forms provides an overview of the pro- ▶

Operating systems. CP/M-80 – where it all started.

- CP/M-80 was the first independent DOS for micros
- 'Software bus' concept developed quickly
- Strong applications support
- Strong commercial language support
- Only one part of CP/M-80 is hardware dependent
- Relatively easy to 'port' to a new machine
- Very stable, robust file system
- Very cheap in OEM quantities, often bundled to end user
- Requires little technical knowledge to use
- Cryptic error messages
- Complete but obscure end user documentation
- Fairly compact, works well on small disks
- Appropriate for available CPU resources
- Very active software user groups
- De facto standard due to spread of machines
- Maintained upward file compatibility
- Maintained upward DOS interface compatibility
- Application portability paths provided to new processors
- Application portability paths to new DOS (Unix) ❑

Operating systems. PCDOS – the new standard.

- Shares some, but not all key points of CP/M-80
- Highly computer system architecture specific
- Computer system architecture is 'real' standard
- Only partial 'software bus' through MSDOS
- Requires little technical knowledge to use
- Strong applications support
- Strong commercial language support
- Low cost to end user
- De facto standard only due to IBM support
- IBM PCDOS documentation good (MSDOS less so)
- Very active software user groups
- Graphics available through GSX
- Still some cryptic error messages
- Doesn't fully utilise machine capabilities
- Some doubts about robustness of file system
- Maintained file system upward compatibility
- Hasn't maintained upward DOS interface compatibility
- No application portability paths indicated
- No multi-user or network support ❑

ject. All software vendors who participate are expected to complete a screening form. Software is evaluated on the basis of its uniqueness and compatibility with Unix System V.

If accepted, a marketing contract is negotiated for distribution of the software. Packaging carries the AT&T and Digital Research logos, and manufacturing is done by Digital Research. Royalties will be paid quarterly.

"Digital Research and AT&T are committed to quality products," said Bruce Weiner of Digital Research. "The UNIX System V Library will provide users with excellent software that is well-documented and easy to use. We encourage software vendors to participate. The UNIX System V projects complement our existing line of operating systems. Users are provided with an upgrade path from one to the next. We intend to meet the demand for a wide range of business applications, so end users can benefit from the powerful features provided in UNIX. The applications library will speed the acceptance of UNIX System V."

Digital Research is porting a version of UNIX System V to the Intel iAPX-286 family of microprocessors. AT&T Technologies retains exclusive rights to the product. Intel and Digital Research were granted non-exclusive rights to market object code versions, and work on the Intel project is proceeding independently of the UNIX System V Library.

DRI PCDOS Languages

Reports from many users indicate there is very good correspondence between the CP/M-86 and PC/MSDOS versions of the various DR languages.

The indomitable Frank Lee has ported most of his PL/I code across to PCDOS and says that apart from a few minor changes concerned with the way he was using the operating system interface, all his PL/I code is now portable in both directions between the CP/M-86 and PC/MSDOS versions of the DR PL/I compiler.

GSX for PCDOS

GSX for PCDOS and a range of device drivers is supplied with all DR PCDOS products which need the GSX interface. This includes CB86, DR Draw, DR Graph and Access 10. The GSX for PCDOS is identical in performance and specification to the CP/M-86 version.

As well as the PCDOS version of GSX, several other machines now have GSX supplied with their MSDOS implementations; for example, the NEC APC and NCR Decision Mate V.

The latest release of the GSX device driver library is version 1.3. This includes new drivers for the Diablo C150 Colour Ink jet printer, Houston Instruments DMP 29/40/41/42 series plotters, Strobe 100/260 series plotters, HP7475A plotter, Philips GP 300L printer and Polaroid Palette CRT camera. The GSX device drivers aren't available separately. They are supplied with your operating system (if it supports GSX) or in some cases, such as GSX for PCDOS, with applications products that need GSX.

DR has also introduced a GSX-86 Programmer's Toolkit. The Toolkit includes two versions of GSX for the IBM-PC, one for CP/M-86 or Concurrent DOS, and one for PCDOS. Included in the kit are the GSX Programmer's manual, GSX Programmer's Language Reference Manual, GSX-86 User's Guide and GSX-86 Technical Note for customising GInstall (a menu-driven program that allows end users to select GSX drivers). GInstall may be modified for any computer-specific set of screen and peripheral drivers, in conjunction with Display Manager.

The Programmer's Toolkit is *not* intended to help someone install GSX for a machine which doesn't have it already. It is intended to assist programmers in using GSX graphics in their applications programs.

Assembler Plus Tools

DR has repackaged some of its assembler products. The SID and MAC programs are no longer available as separate items. The Assembler Plus Tools for CP/M-80 contains MAC, RMAC, SID, ZSID, LINK80, LIB80 and XREF80. The Assembler Plus Tools for CP/M-86 contains SID86, RMAC, LINK86, LIB86 and XREF86. The Assembler PLus Tools package for PCDOS contains PCDOS versions of the same packages as in the CP/M-86 version.

The XLT86 translator for CP/M-80 to CP/M-86 assembly language source code translation has been withdrawn by DR.

Modem Update

Since I last did a review on modems, DataSat submitted the latest version of the World Modem for an update review. The World Modem II looks identical to the previous model and under tests had identical technical performance characteristics. The main difference was in the programming of the ROM which controls the World Modem microprocessor.

The World Modem II now responds as an equivalent manual-connect Telecom Datel modem would. I was able use it to replace manual-connect Telecom Datel modems at several test sites with no modifications necessary to cabling or the communications software on the computers involved. As such, DataSat has now satisfied one of my major criteria for a commercial modem, the first supplier to do so. DataSat has also issued a vastly improved manual for the World Modem, though it is still a rather technical document instead of a friendly user manual.

PAMS News

By the time you read this, Lloyd Borrett should have his IBBS system on line in Melbourne. An IBBS is a BBS system on an IBM-PC running PCDOS. Lloyd has the telephone line installed for the IBBS and was just waiting for a modem and some other minor bits of hardware to get the system on-line as I wrote this column. Check for the number in the AUSTPAMS lists on other RCPM or BBS systems.

I am hopeful that the Software Tools RCPM will soon have a 16M hard disk on line. I have the drive; I'm just waiting for a Compupro Disk 3 DMA controller card to arrive. I don't intend to use the hard disk to put more public domain material on line at this stage. I am installing it in the interests of speeding up response time (yes, I know its pretty snappy as it stands, but I want to improve it if I can) and decreasing wear on the floppy drives.

When I have the increased capacity on line I hope to start experimenting with a categorised message system. Even with 1.2M on the existing floppy disk A: drive, as the amount of public domain software to be catalogued has increased, the catalogues have been eating more and more of this space. The system help files have also been getting bigger lately. This has meant there hasn't always been enough spare space for users to upload their program contributions, and some of the language help files have had to go. The hard disk should solve all those problems.

As for AUSTPAC, no philanthropic corporations have come forward with offers of equipment or money to help put the Software Tools RCPM (or any other RCPM for that matter) onto AUSTPAC, so I guess it's not going to happen. Oh well!

By Bill Bolton

I HAVE been covering a variety of other operating systems besides CP/M for most of the life of this column. So, to reflect what the column really covers I have renamed it from 'Your CP/M Computer' to 'Your Computer Operating System'.

It's certainly *not* my intention to cover all computer operating systems. I know nothing much about operating systems for the Apple II, and have no particular wish to learn. The column will basically continue to cover Digital Research, IBM PCDOS and Microsoft operating systems. It will be moving to cover UNIX in the future, and also possibly the Macintosh environment (I hesitate to call it an operating system at this stage) if it matures to become a serious proposition for business users.

Applications Notes

The following applications notes are the first of a series I'll be reproducing from a journal called *MicroNotes*, which is published by Digital Research to give technical information on the company's products. See Listing 1.

CP/M-86 V1.1 for IBM-PC and PCXT. Application note 05 Floppy Disk Format

Applicable products and release numbers: CP/M-86 V1.1 for the IBM-PC and PCXT.

The IBM-PC floppy disk drive can be either a single-sided (SS) or double-sided (DS), double-density, 40-track per side unit. It is capable of reading and recording data using the Modified Frequency Modulation (MFM) method. Additional information regarding the specifics of the IBM floppy disk controller and floppy disk adapter can be found in Chapter 2 of the IBM-PC Technical Reference Manual.

The values of BSH and BLM determine (implicitly) the data allocation size BLS, which is not an entry in the Disk Parameter Block (DPB). For the values listed above the BLS is 2048 and 1024, respectively, for the double- and single-sided drive.

The product of BLS (DSM+1) is the total number of bytes held by the drive and, of course, must be within the capacity of the physical disk, not counting the reserved operating system tracks.

The DRM entry is one less than the total number of directory entries, which can take on a 16-bit value. The values of ALO and ALI, however, are determined by DRM. The two values ALO and ALI can together be considered a string of 16-bits numbered 00-15 (left to right). Each bit position reserves a data block for a number of directory entries (bits are assigned starting at 00 and filled to the right). Each directory entry occupies 32 bytes; thus for 64 directory entries one bit is set for the double-sided drive (BLS = 2048) and two bits are set for single-sided drive (BLS= 1024).

The CKS value is determined as follows: CKS = (DRM+1)/4, where DRM is the last directory entry number.

CP/M Plus V3.0 Patch 15, 3/7/84, CCP Patch 03

Products and serial numbers affected: CP/M Plus V3.0, Serial numbers 2-000-00001 through 2-000-xxxxx.

Program: CCP.COM

Error Description:

- If a DIR command given for a disk that has system files on it is terminated by a control C, a subsequent DIR command for a disk that does not have System files on it will incorrectly print the message "SYSTEM FILE(S) EXIST". - The error message 'Cannot Load Program' is not terminated with a '$'. This results in garbage being displayed after the error message is printed. *Patch Procedure:* Make a back-up copy of CCP.COM before making any changes. The program SID is required to make the changes. The changes are made by the following sequence of commands. User entries are in bold type.

```
A>REN CCP.SAV=CCP.COM
A>SID CCP.SAV
CP/M 3 SID - Version 3.0
NEXT MSZE  PC  END
0D80 0D80 0100 C8FF
#A683
0683  CALL 403
0686
#A403
0403  XRA A
0404  STA D4D
0407  JMP 699
040A
#S0368
0368 20 24
0369 32 .
#WCCP.COM
0019h record(s) written.
#G0
A>
```

```
Single Sided Drive:
1,248: 128  Byte  Record  Capacity
  156: Kilobyte  Drive Capacity
   64: 32 Byte Directory Entries
   64: Checked Directory Entries
  128: 128 Byte Records / Directory Entry
    8: 128 Byte Records / Block
   32: 128 Byte Records / Track
    1: Reserved Track

Double Sided Drive:
2,528: 128  Byte  Record  Capacity
  316: Kilobyte  Drive Capacity
   64: 32 Byte Directory Entries
   64: Checked Directory Entries
  256: 128 Byte Records / Directory Entry
   16: 128 Byte Records / Block
   32: 128 Byte Records / Track
    1: Reserved Track

Format Character : E5H

Physical Tracks:    Double Sided        Single Sided

                     0 --> 39            0 --> 39
                     0 --> 39            ---------

Logical Tracks:      0 --> 39            0 --> 39
                    79 <-- 40            --------

Disk Parameter Block:

                          Double Sided        Single Sided

          SPT                0020                0020
          BSH                  04                  03
          BLM                  0F                  07
          EXM                  01                  00
          DSM                009D                009B
          DRM                003F                003F
          AL0                  80                  C0
          AL1                  00                  00
          CKS                0010                0010
          OFF                0001                0001

FIELD                    DEFINITION

SPT       Total number of Sectors Per Track

BSH       Data allocation Block Shift Factor,  determined by the
          data block allocation size

BLM       Block Mask which is also determined by the data  block
          allocation size

EXM       EXtent Mask,  determined by the data block  allocation
          size and the number of disk blocks

DSM       Maximum number of Data blocks Supported,  determined the
          total  storage  capacity of the disk drive measured in BLS
          (data allocation Block Size) units

DRM       Maximum number of DiRectory entries for the drive

AL0       determine reserved (ALlocated) directory blocks
AL1

CKS       Size of the directory Check vector

OFF       OFFset from the beginning of the  physical  disk,  the
          number of reserved tracks at the beginning of the
          disk
```

Listing 1.

CP/M-86 V1.1 for IBM-PC and PC/XT, Application Note 04, Early iAPX 8088 Problem

Applicable products and release numbers: CP/M-86 V1.1 for the IBM-PC and PCXT.

Early Intel 8088 microprocessor chips have an obscure design problem that can cause unexpected memory writes if an interrupt occurs when the stack is moved. It takes two instructions to load the Stack Segment:Stack Pointer (SS:SP) register pair, and if an interrupt is acknowledged after the stack segment is loaded, and before the stack pointer is loaded, the interrupt status will be 'pushed' to an arbitrary place with indeterminate results.

It is recommended that all iAPX 88/86 software disable interrupts prior to doing stack loads. The following is a representative sample of a code sequence which will accomplish this:

```
mov     bx,new_stack_segment
pushf                       ; save old interrupt flag
pop     ax                  ; into AX
cli                         ; disable interrupts

mov     SS,bx               ; these two instructions
mov     SP,new_stack_pointer; must be contiguous.

push    ax                  ; place flags in new stack
popf                        ; so we can
sti                         ; restore interrupt flag
```

Non-maskable Interrupts (NMI) can still occur, as can trace interrupts generated by the debuggers using the TRAP flag.

The CPU chips were fixed some time ago (IQ, 1980). The new i8088's mask *all* interrupts automatically for one instruction following any segment register load.

i8088 chips with "(C) INTEL '78" have the problem.

i8088 chips with "(C) INTEL '79" have been fixed.

All IBM-PC's and PCXT's shipped prior to the middle of 1983 seem to have the *old* version of the 8088 and will have the problem. It is possible that they are still shipping machines with the old chip.

New SIG/M Volumes

SIG/M public domain volumes from 153 to 192 have arrived and are now available on the Brisbane, Sydney and Melbourne RCPM systems. There are also some new PC/BLUE volumes (up to at least volume 60) waiting in customs for me as I write, and by the time you read this they should be available on the Software Tools RCPM, PC Connection IBBS and DSE-BBS. I'll let you know more details of what's in both the SIG/M and PC/BLUE new volumes next month.

PAMS News

There are several new systems on the list this month. Lloyd Borrett has the PC Connection IBM BBS system up and running in Melbourne. The IBBS software for IBM PC systems isn't public domain, but is available at modest cost from Lloyd.

Steve Engle, SYSOP of the Dick Smith Electronics BBS is co-operating with Lloyd in modifying the IBBS software for Australian conditions. I'm also having a look at some of the modem interface aspects of it.

The Newcastle Computer Club has its RCPM system on line now, but please note the restricted hours. Later the club hopes to go 24 hours with it. The Adelaide Micro Users Group now has its system on line daily, but still on restricted hours. The RCPM file transfer facilities on the Newcastle system are only available to financial members of the club, however visitors can access the bulletin board section of the system.

In Sydney, Larry Lewis has the Prophet BBS up and running on a Tandy TRS-80. The Prophet system appears to be very fast and has several interesting aspects. Larry says its based on "Bread Board" software.

In Gippsland Max Moore has the first part of his MAIL BUS system in operation. At the moment only the mail boxes are working. The concept of the MAIL BUS is to minimise the time you need to be connected to the system to transfer. You can put anything you like in the numbered mail boxes of other users and recover information from your mail box using Christensen protocol. The idea is totally different from anything I have ever come across before on any sort of remote access system. Max charges $10 a year to use the system.

The number of the Attache BBS in New Zealand has changed, the new number is in the list this month.

The Software Tools RCPM now has a Compupro Disk 3 hard-disk controller on loan, and as soon as I can get the new BIOS implemented the hard disk should be on line.

PAMS Numbers

Australia

Software Tools RCPM (ST-RCPM): (07) 378 9530 24 hours EST.

Your Computer BBS (MiCC-BBS): (02) 662 1686 24 hours EST.

Micro Design Lab RCPM (MDL-RCPM): (02) 663 0151 24 hours EST.

Sydney Public Access RCPM (SPA-RCPM): (02) 808 3536 24 hours EST.

Omen RTRS (OM-RTRS): (02) 498 2495 1630-0900 + 24 hours weekends.

Sydney TRS-80 UG RTRS (STRUG-RTRS): (02) 332 2494 24 hours EST.

Prophet BBS (PROPHET-BBS): (02) 628 7030 24 hours EST.

Dick Smith Electronics BBS: (02) 887 2276 24 hours EST.

Newcastle RCPM (NCLE-RCPM): (049) 68 5385 1700-0830 + 24 hours weekends.

Melbourne CBBS (MICOM-CBBS): (03) 762 5088 24 hours EST.

Sorcerer CBBS (SCUA CBBS): (03) 836 4616 24 hours EST.

TARDIS RCPM (TARDIS-RCPM): (03) 67 7760 1800-0800 + 24 hours weekends.

PC Connection IBBS (PCC-IBBS): (03) 528 3750 24 hours EST.

Gippsland RCPM (GL-RCPM): (051) 34 1563 24 hours EST.

Gippsland MAIL BUS (GL-MBUS): (051) 27 7245 24 hours EST.

Adelaide Micro UG BBS (AMUG-BBS): (08) 271 2043 1000-2200 CST.

Computer Ventures BBS (CV-BBS): (08) 255 9146 24 hours CST.

Outback RCPM (OUTB-RCPM): (089) 27 7111 24 hours CST.

OMEN II RTRS (OM2-RTRS): (089) 27 4454 24 hours CST.

OMEN III RTRS (OM3-RTRS): (09) 279 8555 0800-2400 + 24 hours weekends.

New Zealand

Attache RBBS (ATT-RBBS): ISD 64 9 78 9084 + 24 hours NZT Domestic (09) 76 9084. ❑