Your Computer

FOR BUSINESS AND PLEASURE

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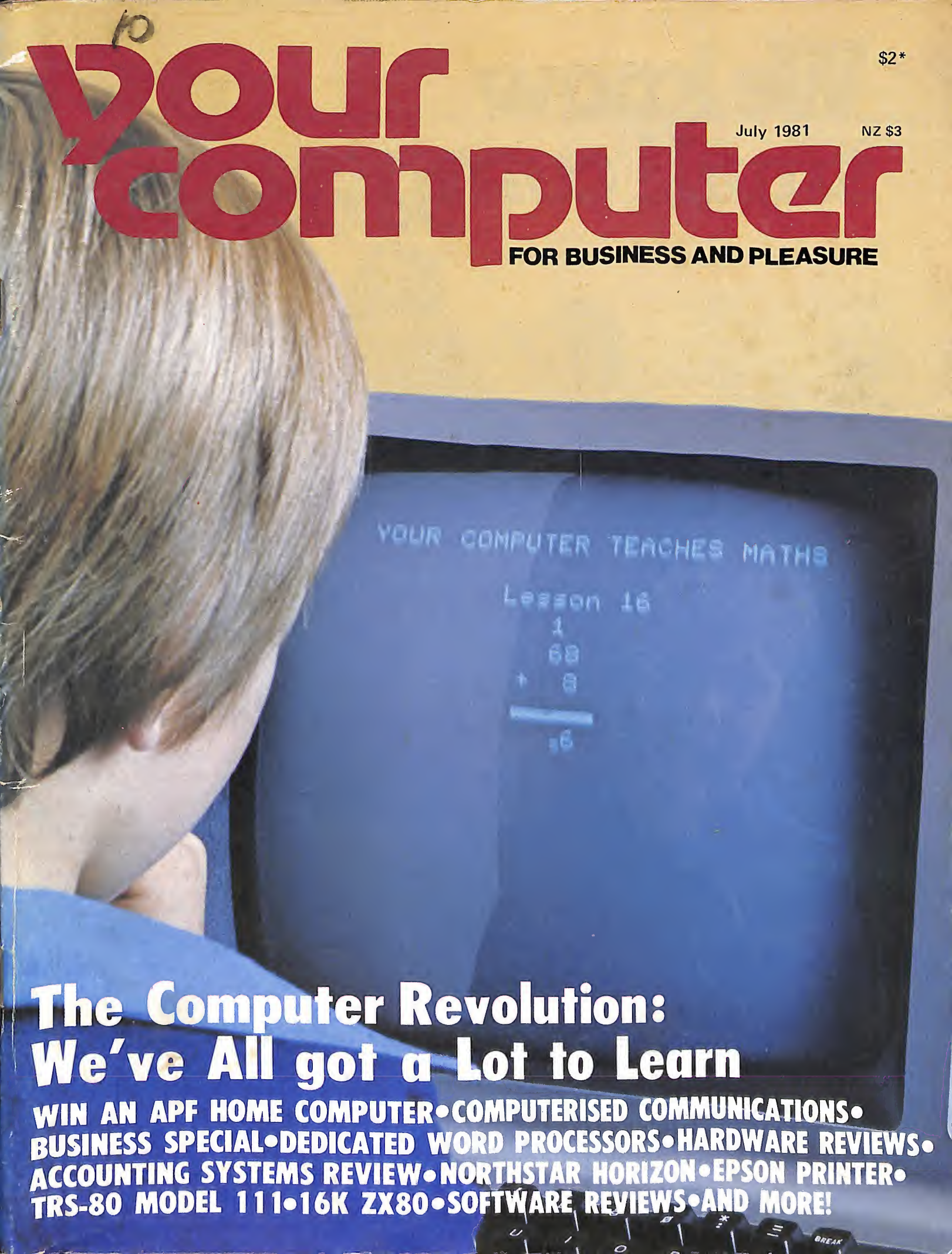

The Computer Revolution: We've All got a Lot to Learn

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inside your computer

JULY 1981

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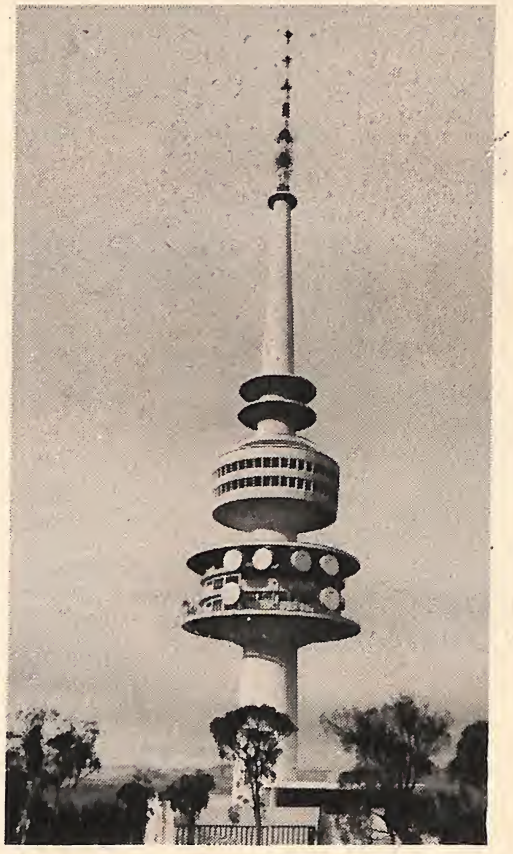

Canberra's Black Mountain tower fair bristles with the modern weaponry of communications.

THE CHANGES being wrought by the communications revolution are enormous. We are taking part in changes which are seeing parts of society go from being based on the production of material goods to where information is the new currency. Whether it takes over all of society remains to be seen.

Many office workers will, soon, no longer have to travel from home to work, but will stay at home and use a computer terminal to earn their salary. You can imagine the impact this is going to have on family life. We have all been conditioned to going somewhere else to work and going home to relax. Rarely, if ever, do the two mix. How are you going to find the discipline to work and not be distracted by the home atmosphere? Is that a problem? We often talk about radical changes, but a large part of the working world working from home is about as radical as you can get.

BEFORE WRITING the following paragraph, every person in a three-metre radius had to cross their heart and hope to die, wood was hoarded and touched (frequently), a box full of black cats was hired for the day, every ladder for miles around was nailed flat to Mother Earth and several specially blessed rabbits' feet were sticky taped to the word processor BUT. . .

The news is that our first issue did magnificently. For your support, we sincerely thank you. As Dean Martin is oft to say on his show, in between snatches of brandy, song and witticisms, ". . . and keep those cards and letters rolling in." Well, not only did your cards and letters keep rolling in, but they kept on rolling in. And on and on. We've enjoyed every minute of it, so don't stop whatever you do. It's not every day you see a publisher cry with joy. We don't want ours to stop.

WE PRINTED 30,000 copies of our first issue. You'd be lucky to find a copy now. In Australia, to sell that amount of magazines for a special-interest group is doing very, very well indeed. We thought our first issue was a good effort; we wait for your reaction as to how well we've done with Number 2.

Les Bell

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your computer news

Going Down The Gurgler?

WE'VE JUST sighted IBM Australia Limited's 1980 annual report. It's not that we're slow, it's probably because the glossy and lavish presentation of the report took time to put together. . .

We won't bore you with facts and figures. Suffice to say the company made some money. But what is interesting is the claiming throughout the report that IBM was increasing its market share.

Sorry to have to tell you this, but our information is that IBM Australia's market share is in the mid 30 per cent range, the lowest market share of any IBM subsidiary in the world. And things don't look like they're improving, either.

Two Years To Go. . .

ADVANCES IN computer technology in the next two years would outstrip anything seen so far,according to a computer consultant.

New machines, tagged micromainframes, and advanced microcomputers with the power of current large mainframe computers, but at a fraction of the cost, would be readily available in about two years.

Mr Richard Cousins, the principal consultant with Arthur Young Services, told a recent businessmens' seminar on the microcomputer revolution to wait for a year before buying any more computer equipment because of this "coming revolution".

He warned, though, that if a business had immediate need for a computer to buy one.

"An analogy is having a warehouse full of stock you usually have moved by a rail freight car, then a semi-trailer. But you're told that in a year's time you can have a light truck that does a thousand miles to the gallon; you can do all your own local deliveries. But what do you do in the meantime, stop delivering?" Mr Cousins said.

His message to the businessmen was clear: it was a real revolution about to take place in computers. If managers and businesses ignored the new technology, they did so at their peril.

Mr Cousins spoke of advances which would greatly simplify and speed-up the writing of complex and complicated business programs.

"You'll have to stop thinking in terms of hardware," he said. "Soon there won't be the problems of memory capacity or storage — it's software that's going to be the problem."

While the cost of computer hardware continued to drop, the cost of software was climbing rapidly.

Cheap Printers (At Last). . .

ELECTRONIC CONCEPTS has put two new printers onto the market for Apple II users.

Cheap graphics printers are hard to come by, but according to Electronic Concepts, Seiko's Seikosha GP80 graphics printer is an "ideal" low cost, fully-featured printer for Apple II computers.

According to the company, it features "precise graphics resolution, single and double-width characters, full ASCII, upper and lower case, a self-test program, 80 characters a line (12 characters to the inch), 12 watt power consumption while printing, and weighs just 2.5 kilograms."

The single hammer-print head is guaranteed for three million impressions.

Another printer, a touch more expensive with prices beginning at $1840 and going up to $3200, is the Infoscribe, a printer for the "small systems market".

Electronics Concepts is Australian distributor.

Four models of the Infoscribe are being released during the year. The model 500 is the basic unit, but quality and options rise until you get to the Model 2000, a wordprocessing-quality printer. All the printers have optional character sets or software loaded character sets and up to 3 Kbyte buffers.

The low-cost Seikosha graphics printer for the Apple II.

Teacher's PET at Taylors College, South Melbourne.

What a Pet!

A MELBOURNE school has used Commodore micro-computers for eight months without a single breakdown, according to its headmaster.

Not stunning? It is when you think of what kids can do to computers.

The school, Taylors College, a South Melbourne senior secondary school, uses five Commodore PETs and a 3000 series.

The principal, Mr Robert Read, says the school bought Commodore because it had offered compact, powerful computing facilities at a reasonable price.

The supplier, B.S. Microcomp, of Melbourne, had also promised reliable back-up service.

Taylors uses its PETs to give year 11 and 12 students experience in programming and computer-aided learning.

The bigger 3000 series microcomputer helps with school administration as well as teaching the computing science course to more advanced students.

Paper Mountains

A DIRECT link between a word processing system and a central computer has taken Aetna Life & Casualty one step closer to the paperless office.

The connection, between an IBM 8140 Word Processing System and the company's central computer, an IBM 4341, will allow the automatic production of text on the 8140 system as a result of normal business transactions through the central computer. Information held on the central computer will be automatically inserted into this text.

The system will also mean that Aetna will keep "paperless archives". Documents and text produced in Aetna will all be held on the central computer.

The branch link-up will give part of the network necessary to allow a company-wide electronic mail facility, eventually leading to the central archiving of all text produced within the company.

Bluechip Software

A COMPUTER program to store and analyse stock exchange information and to display it in detailed bar charts has been released for Apple II users.

The Australian Stock Analyser lets the user insert and store information on up to 50 shares or commodities, each holding six month, 120 weeks or 10 years of data with daily, weekly or yearly prices accordingly. Data files include provision for high, low and closing price as well as volume.

The user can then obtain highly detailed graphic displays of the chosen stock's movement either on the screen or on a suitable printer.

For further information contact Keith Stewart, Seahorse Computers, PO Box 47, Camden, NSW 2570, on systems to help the investor control his portfolio in minutes per day.

Data Do It!

PJB SYSTEMS has written a sophisticated program to overcome the problem Exidy Sorcerer users face when trying to save alpha numeric data on tape.

The program handles the tape read-write of alpha numeric and numeric data, but while it is handling the data it allows you to assign it to user "file areas", depending on which mode you choose.

Mr Paul Balin of PJB Systems says it is not just a utility which only works when it is loaded separately, with an extra load operation to get your program on board, it actually becomes part of your program.

The Magic String Saver is available for $29.95, including postage, packing and operating manual, from PJB Systems, 24A Simpson St, Bondi, NSW 2026.

PC In The Pocket. . .

COMPUTERLAND HAS announced it's now marketing the new Sharp PC-1211 pocket computer.

The computer uses BASIC language and features a dot matrix display of up to 24 digits. Fully programmable, an optional cassette interface (the CE-1211) is also offered for either saving programs or loading them.

There is also an optional printer.

The recommended retail price for the Sharp pocket computer is $249. The printer-cassette interface costs $149.

Disk Cleaning

THE 3M Company has put on the market a head-cleaning diskette kit which it claims will reduce data loss and job reruns.

The Scotch 7400 standard and mini 7440 drive compatible head-cleaning diskette kits use a liquid cleaner.

3M says the kits will remove dirt and oxide debris from diskette drives and heads.

The cleaning diskettes can be used with single and double-sided drives about 15 times.

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Computer and aviation experts call the T80-FS1 a marvel of modern technology. *You'll* simply call it *fantastic!*

Special Features:
- 3 frame-per-second flicker free animation
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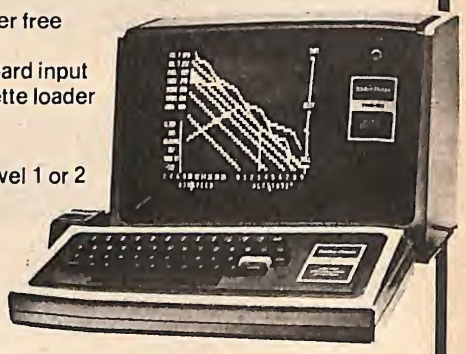
- Constant feedback cassette loader

Hardware Requirements:
- Radio Shack TRS-80, Level 1 or 2
- 16K memory
- *Nothing else!*



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WY/J-3

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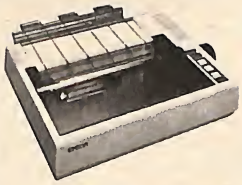

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CIS COBOL

MICRO FOCUS, the marketers of CIS COBOL and FORMS-2 — two professional software products which have to date been largely the domain of blue chip companies such as Intel, Texas Instruments, Siemens and many others — has released products especially packaged for Apple II.

This package consists of easy to use language extensions for CRT screen handling and a comprehensive interactive debug package.

The FORMS-2 utility, a COBOL Source code generator for use in creating screen formats, is implemented for the Apple Screen.

It is necessary to have the Z80 based Softcard (by Microsoft) installed.

- CIS COBOL is ANSI 64 COBOL, that means programs generated are compatible with larger minicomputers and mainframes.
- CIS COBOL is Low Intermediate COBOL, which puts Apple II on par with powerful minicomputers.
- CIS COBOL provides dynamic loading of segments (overlays) for even large programs to run on Apple II.
- FORMS -2 produces standard COBOL, and greatly increases programmer productivity.

Micro Focus's news coincided with Electronic Concepts' announcement that Telecom approval has been obtained for the connection of Apple II Computers via its RS232C interface to any approved modem, or modem/multiplexer.

The combination of an industry standard COBOL, and communication facility are the last hurdles for Apple II to obtain acceptance in the COBOL dominated world of EDP users in search of truly distributed computing facilities.

Wordplex Ups The Ante!

THE WORDPLEX Corporation has introduced three new word processing units which combine, according to a spokesman, Ms Susan Hitchener, recent technological advances and design features made to keep operators comfortable and productive.

The Wordplex 80-3 is a powerful, standalone system which serves not just as a word processor but also as a versatile communications system and a programmable computer. It can operate as a terminal in a Wordplex shared-resource system, permitting access to large data bases.

Double-density, double-sided disks in dual drives mounted beneath the screen give about half a million characters of one-line storage. Additional mass storage is available through communications with the large data bases of a Wordplex/4 or /7 systems.

A high-speed daisy-wheel printer produces letter-quality printing up to 45 characters a second. Software features with the 80-3 include Super Sort, an arithmetic program, the computer language BASIC and an automatic select and print program. A report program generator (RPG) for mailing lists, invoices, financial documents, sales orders, and many more applications. Some of the software is optional.

The Wordplex 80-2 is a paler version of the more expensive 80-3. Internal memory is 64K. The system employs single or dual minidiskette drives.

Early models of the Wordplex 80-2 will have no communications capability, but this may be offered later. These models will be sold only as stand-alones. They cannot be connected to a multi-station system.

The Wordplex 80-1 is a new terminal, fully compatible with existing Wordplex/4 and Wordplex/7 multi-station systems. Memory capacity is 16K.

The three new systems are housed in newly designed cabinets featuring etched screen for reduced glare. A new "step-scan" technique controls character form for ease and clarity of viewing.

The screen's vertical tilt can be adjusted through a 20-degree angle. The separate keyboard is also adjustable in tilt and position, with an optional wristpad.

Panasonic Update

A COMPREHENSIVE computer system, including hardware, software, and training has been released by The Computer Company (TCC) Pty Ltd, with a price tag of about $10,000.

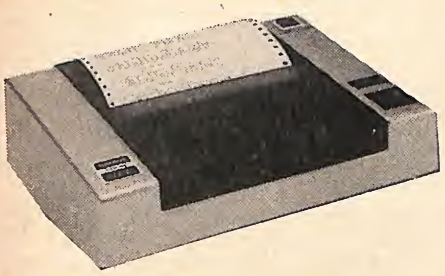
The price puts the system — based on the Panasonic 740 computer — into the bracket once occupied by hobbyist computers, yet offers a full range of business applications.

The model 740 is one of the Panasonic family of microprocessor-based computers for which TCC is sole Australian distributor. There are about 350 Panasonic computers installed in Australia.

This offer from TCC includes application software for order entry, invoicing, accounts receivable, accounts payable, stock control, and sales analysis.

Optional applications include the Panasonic word processing package, Panaword, which is a full screen-based system with all the functions and capabilities of a conventional word processing system.

The compact desktop computer features floppy disk storage and a 120 character per second Panasonic printer. The total price of $9,950 includes five hours training at TCC's Sydney offices in the use and operation of the system.



New From Tandy

TANDY IS up and running in the Australian microcomputer race. Its latest attack on the market coincided with the recent release of the Tandy TRS-80 Model III.

The Model III is being sold as a system for all computer users. It begins as a basic computer but builds to be progressively more sophisticated and expensive; right up to a business system at about $5500.

For beginners, Tandy is offering its Model I, with some changes, which hooks in to the family TV. It's being promoted as a cheap starter system.

Also new is a plotter-printer (pictured) which allows you to print alpha numeric characters at four angles of rotation. You can also plot straight lines, dotted lines and curves.

Tandy now offers a full complement of equipment in the "small computer" market. It has recently released a high-speed daisy-wheel printer and is building up its library of software.

Blooming Omission. . .

IN THE full bloom of enthusiasm, we inadvertently missed a few word processing software packages in our first issue Word Factory round-up. In particular, we missed two quite important ones.

The spellbinder, which will be fully reviewed soon, is a CP/M package said to rival WordStar, itself an extremely well thought-of package. The Spellbinder is available from Software Source, PO Box 364, Edgecliff, NSW 2027, or 'phone (02) 33 4536 for more information.

The CS Word Processor, otherwise known as WordMaster, is another good Australian-written program for the Apple. We are in the midst of putting a package through its paces for a future review, but if you can't wait to read what we say about it contact Computer Solutions, 6 Maize Place, Mansfield, Qld 4122 or 'Ph (07) 349 9883 for more information.

It Is Indeed Alive!

IN OUR first issue we had the hide to report that the Sinclair ZX81 was little more than a gleam in the designer's eyes. We're glad to say we were wrong, led astray, as it were, by a bit of wrong information.

By all reports the ZX81 is a better bit of computer than the ZX80 (its far from mediocre predecessor), and the prices quoted in England for it are amazing!

In London the ZX81 will set you back 70 quid, compared to the 100 quid for the ZX80. And the ZX81 *is* available, although at the moment there's a bit of a waiting list.

The ZX81 is the same as the upgraded-ROM ZX80 (reviewed this issue, see page 78).

We're grateful to Mr Steven Spink from South Australia for giving us the good oil on the ZX81.

The yes, no, maybe ZX81 is a definite yes! In this graphic shot of the ZX81 you might be thinking nothing much has changed from the ZX80...but different it is.

Source's Source

MEMBERSHIP TO the vast information network in the US known as The Source is now available (see story this issue).

Seahorse Computers is now a dealer for the Source and can supply all the details on becoming a member and the other bits and pieces that turn your computer into a Source user.

Address enquiries to Seahorse Computers, PO Box 47, Camden, 2570, NSW. 'Phone (046) 66 6406.

New 16-bit Computer

A STANDALONE 16-bit computer, based on an 8086 microprocessor and designed to fill the gap in the range of machines available to systems houses and OEMs, has been released in Australia by Paperwork Systems Pty Limited.

This follows the recent launch of the system — the Piiceon 1000, made by Piiceon Incorporated — at the US National Computer Conference in Chicago.

While its US developer has more comprehensive hardware and software improvements underway, the acceptance so far given the Piiceon 1000 stems from a powerful 16-bit hardware package.

In its present form it has the CP/M 86 operating system, Microsoft BASIC and CIS Cobol.

Pagination System

HENDRIX has released the first interactive, full-page layout newspaper system in the world to the Australian market.

The Hendrix PagePro pagination system will be introduced locally by Hendrix's Australian agents, the TCG group of Crows Nest Sydney.

Released in the US at the Atlanta congress of the American Newspaper Publishers' Association (ANPA) in June 1980, PagePro is claimed to be the first system which has met the total challenge of automated electronic newspaper page make-up. A director of TCG, Mr Mike Barraclough, said the page layout functions included headlines, body copy, photography and artwork in a cost-effective package.

"The system has applications across the board in newspaper publishing ranging from small and regional newspaper operations through to metropolitan dailies," he said.

The PagePro system is a vertically integrated, fully interactive page layout system capable of fulfilling all the required functions of full scale pagination.

The system's development was based on straight editorial page layout needs.

Hendrix also announced a display terminal using the same hardware at the ANPA congress in Atlantic City in June this year. The terminal uses a 38 cm high resolution graphic display and 30.5 cm text editing monitor.

The graphic display provides for full page display as well as zooming in on a desired area of the page to examine copy fit in detail.

The pan scrolling facility permits close scrutiny of whole-of-page layout at full size.

All standard text editing and data base functions are through the key board, which also has a separate set of page layout keys.

Using a joystick or simple keystrokes, the editor can assign copy elements, photos and advertising artwork, their size, shape and position on the page. With these tools he can move headlines, bylines, leads, jumps and copy slabs at will.

Mr Barraclough said the new Hendrix system had created "immense interest" within newspaper publishing circles in Australia and overseas.

"Newspaper operations today are often characterised by labour-intensive production, resulting in a continuing cost squeeze which has seen the failure of many publishers, both large and small throughout the world.

"PagePro saves on costly labour and materials by producing a full page galley with all editorial and full type display advertisements in position. Composing room operators need only tack down half tones or photographs and the page is camera ready. Headlines, borders, cutting and strip-ins are completely eliminated," he said.

"PagePro does away with the necessity to collect, collate or supervise the paste-up stage. It automatically corrects to maintain the desired style in the appearance of the newspaper, having regard to column and gutter spacing.

"Essentially, the system puts direct, interactive control of all stages of page production directly into the hands of the editor."

Hendrix Electronics has specialised in newspaper applications for its equipment for the past 25 years.

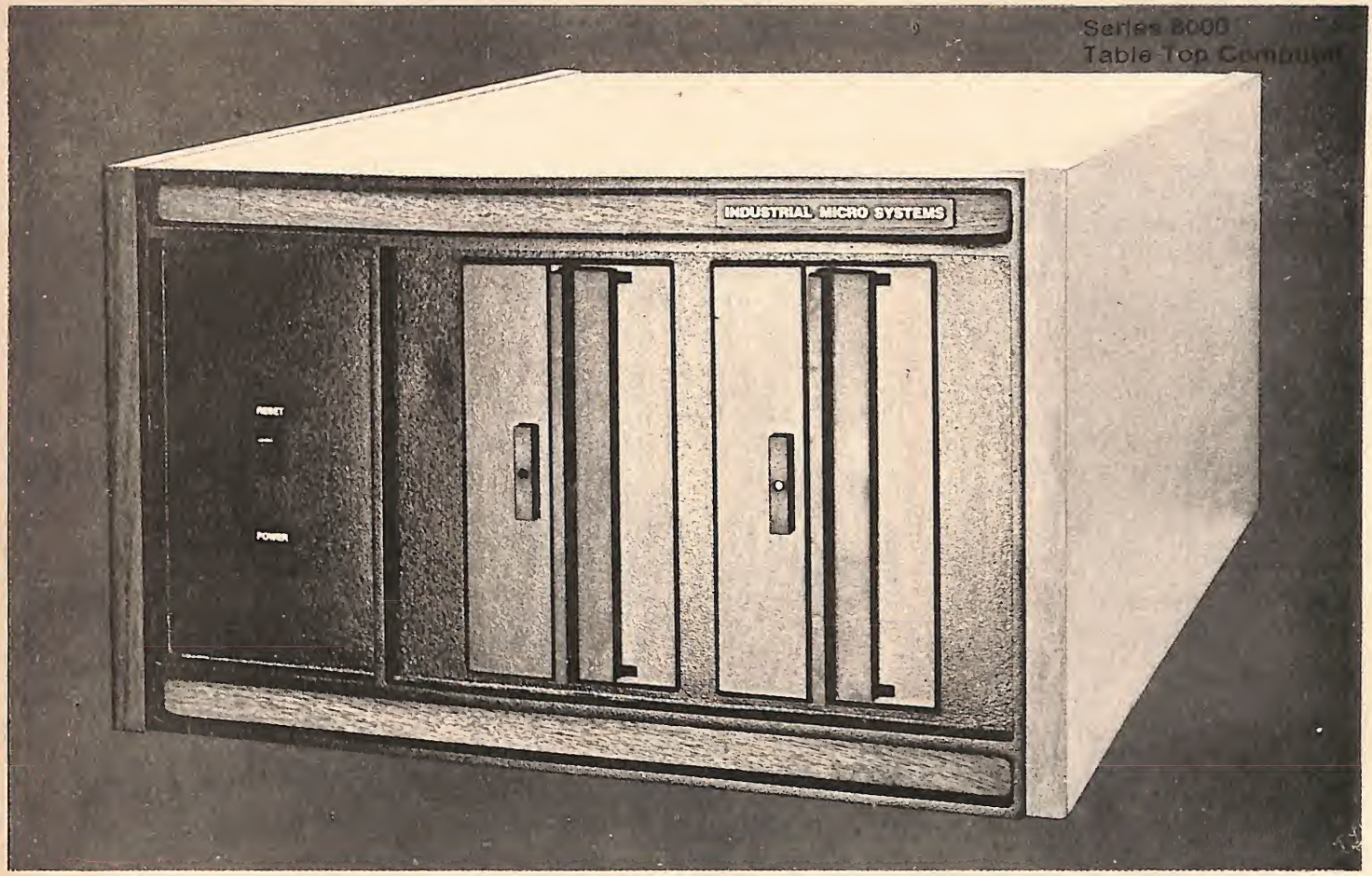
Already installed in a number of major American and European newspaper publishing houses, the system has been ordered by newspaper companies throughout the world.

The Chicago Tribune installation, with more than 300 terminals, is believed to be the largest in the world.

PagePro installations to date have reduced expensive manual intensive layout operations, increased editorial deadline times and streamlined production rooms.

Other features of the PagePro system include a storage facility for classified, display and editorial copy, and trial fitting of material for shape or exact size. A complete set of shaping modes enables the editor to flow copy around, onto or over pictures, caption and display advertising.

An impressive-looking system, the Piiceon 1000 has been made to fill a gap between mini and micro computers.



The face is (becoming) familiar

No surprise,..it stands out in the crowd. The quality and reliability that Industrial Micro Systems' customers have grown accustomed to is now available in our complete system. A system that will grow with your needs.

You can start with a minimum 16K, single disk system. The system shown above can be expanded to 608K-Bytes of fast RAM with three double-sided, double-density drives. And more to come.

The microcomputer industry standard CP/M™ operating system is delivered with the system. PASCAL is available. Industrial Micro Systems systems users are developing an impressive array of application software.

The system is offered in rack mount and table top versions and also in our own desk enclosure.

In addition to gaining in familiarity, the Industrial Micro Systems picture for total system products should be coming into focus for everyone. Advanced, reliable electronics...industry standard software... and functional, high quality enclosures.

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Computer Mail

MODERN TECHNOLOGY has taken computer-generated mailing systems from the electro-mechanical to the more versatile electronic hardware.

An example available in Australia is Bell & Howell's Phillipsburg AIM system which cuts, folds, inserts, seals and meters continuous forms in a single operation.

"AIM, standing for automated in-line mailing, systems, of which there are seven models available, are custom adapted to process monthly computerized billings, statements with enclosed reminders and computer letters with selective inserts in one automated function," says Mr Jim Ritchie, the manager of Bell & Howell Australia's business equipment division.

"For many of these applications, cut and folded electronic data processing (EDP) material plus additional inserts can be prepared for mailing quickly and economically."

He says about 200 Phillipsburg electro-mechanical machines had been sold in Australia, but Bell & Howell had just recently installed its first electronic AIM system in this country.

The customer, moving up from an earlier version of Phillipsburg, is Grace Bros, which has its headquarters at Broadway in Sydney.

Grace Bros becomes the first department store in the nation with a machine of this capability.

Mr Ritchie said the equipment had been custom designed to speed up the output of statements and consequently cashflow, eliminating the previous system of bursting, folding and inserting in three different office locations and phase all three steps into one function.

He said the machine had the added ability to insert advertising material and electronically cope with multiple page statements halving the time element of the total operation.

Efficiency, security, economy and flexibility, he says are the operative words in describing the AIM series of machines where, in the US alone, over 600 have been installed.

"Bell & Howell is the only office equipment company with a total electonic mail room concept," Mr Ritchie says, "and we are in the unique position that no one else can provide total, integrated systems for inwards and outwards mail."

He said the company was currently demonstrating its product to banks, insurance companies, credit card operations, large retailers and finance companies.

Bell & Howell's electronic mailer speeding up the job at Grace Bros.

Seeing De Forest For De Trees

DE FOREST Software, of that incomparable city Nunawading in the icy depths of Victoria, specialises in Tandy TRS-80 software and Tandy TRS-80 II business and personal microcomputers.

We thought we'd clear the air a bit, because the office idiot may have led you to believe De Forest specialised in something else other than TRS-80 stuff in his software review in the first issue.

Even the best of us make mistakes. We'll try to keep the office idiot's down to a minimum. . .

Terminal Fit

B.S. MICROCOMP has announced the release of its MICROCOMMS package which enables the Commodore 8032 Microcomputer to be used as a terminal for other computer systems. The package consists of an 8032 with serial interface and communications software developed by B.S. MICROCOMP. Optional extras are an 80 column printer, which uses continuous fan-fold paper, and a floppy disk for data storage. Originally designed to be used with Telecom DATEL lines at 300 baud, the MICROCOMMS package has been used successfully at faster rates up to 4800 baud.

Mr Bill Saunders, MICROCOMP's managing director, explained that the Commodore 8032 Micro was chosen for the task because of its integrated, industry standard 80 column scren and the video controller chip which facilitates rapid screen scrolling. The specially developed communications software effectively turns the 8032 into a VDU with 24K of scrollable screen memory. This means that the user can connect to a remote computer to interrogate a database and have the entire dialogue stored in the 8032's memory. The connection can then be terminated and the dialogue printed out in whole or part and also stored on disk or tape.

When this capability is added to the large range of existing software for the 8032 Microcomputer, it becomes a viable alternative to the mainframe dependent "dumb"terminal.

Software For Hardware

THE RELAXED Sydney suburb of Narabeen is hardly the location you would expect to find an advanced computerised office, but Graham's Hardware has such an operation.

The system was supplied by Concise Data Systems, an Australian-owned computer company new in the industry.

The hardware store needed a system which would perform functions involving invoices, debtors and creditors records, general ledger and payroll, as well as stock control and word processing.

Concise installed a turn-key system last April. Computer hardware included an Alfa Micro 10 megabyte cartridge system coupled to a 200 character-per-second General Electric Dot Matrix printer with two VDTs.
Software requirements were developed from standard Concise programs.

The system was successful and expanded to bring on line Graham's other companies.

Increased data storage capacity was required to meet the expansion, and this was achieved by extending the hardware to 90 megabyte. Another VDT was also installed.

The word processing facility was also extended, specifically for Graham's travel agency operations, which required travel details, direct mailing and documentation facilities.

A General Electric dot matrix was chosen for this task.

The general manager of Concise Data Systems is delighted with the installation and says, "We were confident one of our standard software programs would be simply and inexpensively converted to incorporate the special requirements of Graham's"

Micro With Macro Storage

THE ARCHIVES III, a desktop microcomputer with an inbuilt five Megabyte Winchester disk drive, has been released in Australia by Archives Distributor, CGF Electronics.
"This unit offers unequalled value for money and removes one of the major barriers that has prevented the micro entering medium-sized businesses," said Mr Gower Smith, general manager of CGF Electronics.

"The unit would sell for the same price as many equivalent sized micros that incorporated floppy disk systems.

"The system offers a unique mix of proven and reliable technology, merged with the new hard disk technology.

"Until now the lack of storage has forced many small businesses into the minicomputer area.

"The inbuilt Winchester incorporated in the unit offers ten times the speed and storage without compromising the units micro size or reliability."

The Archives III case contains a Z80 CPU at full 4MHz, S100 bus, Winchester hard disk drive, a double sided double-density disk drive, 12 inch green phosphor monitor and detachable Honeywell keyboard.

"With this combination, and our locally written and proven software, any business can run debtors, creditors, and other commercial software without capacity worries," Mr Smith said.

"The operator does not need to spend hours memorising umpteen control/alpha key combinations to get the system into operation."

Most of the supporting software for the Archives III has been prepared by the Australian firm Integrity Management Services.

"The IMS software is integrated and is designed specifically for Australian conditions. Version 3.0 of some modules are now available," Mr Smith said.

The Archives III system also has greater expandability than the previous models, with slots for graphics and communications.

The Word processing system on offer with this unit provides for Wordstar's integration with data files on "Datastar", 'Spellstar", Mailmerge", "Supersort" and other programs.

Concise hardware/software in a hardware store.

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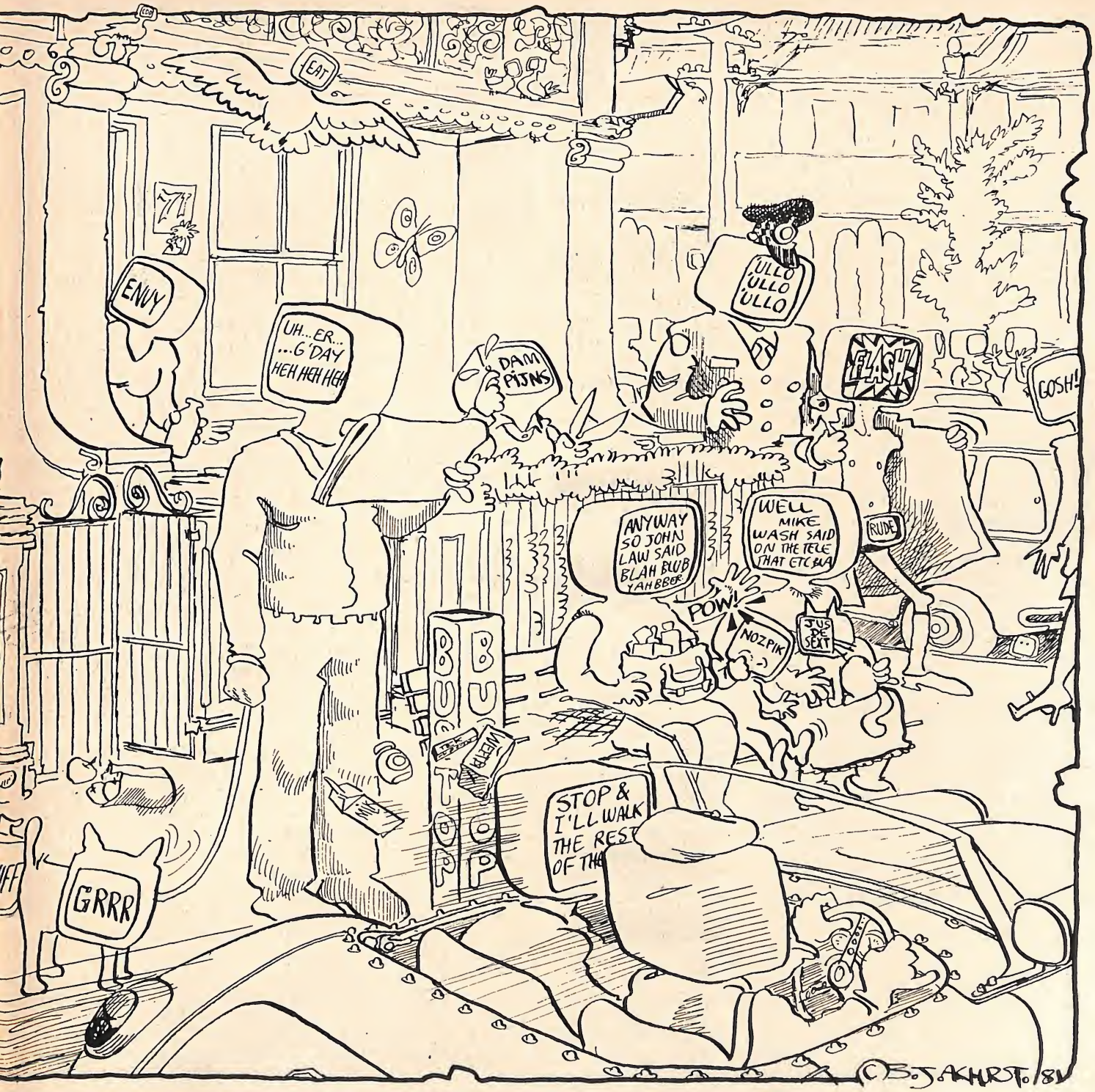
THE STING

What the world has called progress in the past 50 years is almost too much for the imagination to comprehend. The wireless was a remarkable invention, television the child of a genius and the two together an integral and inseparable part of life today.

Your Computer *editor LES BELL looks at communications in the future. He reports that what's likely to happen will make radio and TV look like the toys of a child. . .*

THE EARLIEST computers were designed in response to the panic of war — the problems of calculating the correct point at which to aim an anti-aircraft gun, so that by the time a shell got there an enemy aircraft ran into it, was one of computing's biggest catalysts.

Ever since, computers have been wrongly named. A lot of the work done by them is not numerical computation at all, but mainly searching through lists or sorting lists or compiling programs and other, similar jobs. Very little computer time is actually spent in solving problems of numerical computation.



As micro computers became cheaper and cheaper, many computer manufacturers have been slow to realise that the average individual does not need a horribly complex computer, or indeed the use of any computer to solve their problems.

Two shocking admissions in one sentence — firstly, that you don't need a home computer anyway, and, secondly, that people who should know better have managed to convince both themselves (and you) that you do.

So what is this, a gigantic con trick? Well, while it's true you don't need a computer, it doesn't mean you couldn't benefit or profit by having one. As I've said before, you don't need a word processing system to write "Thank you" to Auntie Mary for the lovely socks — however,if you want to send a letter to each of the 200 members of your theatrical society, a word processor is mighty handy. People tend to deal with a problem by avoiding it at all costs. Just ask any overworked club secretary.

But the fact is, most people are not avoiding complex calculations. They just don't have any to do. What's the point of having a personal computer, then?

The answer is communications.

On The 'Phone

Computers can communicate with other computers, as most bank customers are finding out with the introduction of Automatic Teller Machines. Basically, a computer regards another computer just like a printer or any other device which might be attached to it. It has an input/output port which is attached to a device called a modem (modulator/demodulator), and this in turn is connected to the 'phone line. At the other end of the phone line is another modem, and then another computer.

Modems come in two flavours: direct

coupled and acoustically coupled. They both do the same job; they turn the ones and zeros from a computer into audible tones that can be sent down the telephone line. One type is directly, electrically wired into the telephone line, while the acoustic coupler uses a small loudspeaker and microphone to attach to the telephone handset.

Originally, modems came into being to meet the needs of remote users of large time-shared computer systems. They allowed users to type in data to be processed at a computer centre often thousands of miles away, with the results printed out at the user's terminal. That was all they were used for: transferring the input and output of computer programs.

Today, things are a little different. Time-sharing has become less significant, owing to the availability of mini and microcomputers. A small share of a large computer can be a lot less that the exclusive use of a small computer. The accent now is on the use of large machines to store and allow fast access to large amounts of data.

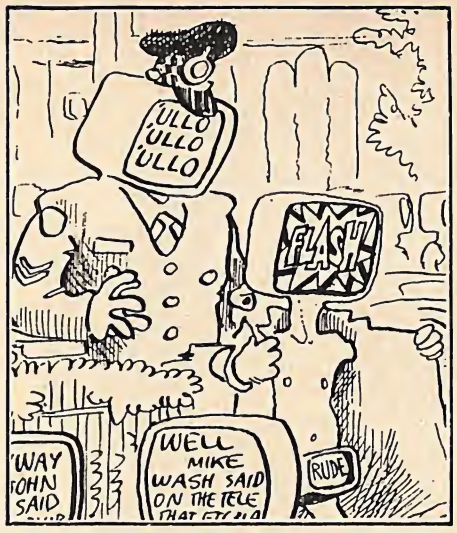
Such large data bases are becoming the reference libraries of the future. Take one example, located in Sydney.

In business, it's important to know something about your potential customers. A Sydney company, APASCO, has built up a data base of economic, social and demographic data, including current and historical census material. From that data base, it is possible to work out different facts about the people living in different States, cities, suburbs or postcodes. Who spends most on life insurance. How well educated are they? What are their family sizes? How old are they? Using a terminal in your office to access the APASCO information, it is possible to not only decide where life insurance buyers live but also to design special policies to best meet their needs.

Note that the APASCO's information does not include any information on any particular individual — it only gives averaged information on an area. But there are important questions of invasion of privacy involved in the growth of data bases and computer professionals are well aware of these. The advent of the personal computer may do much to dispell people's fears — once you've used a computer you don't feel quite the same awe of it in the future and you understand just how difficult and expensive it would be to collect a 'file' of information on an individual.

Electronic Mail

With the advent of the ubiquitous word processor, we are now able to create letter-perfect documents and print them out for mailing. At *Your Computer* we've gone one step further. At least two of our contributors no longer supply typed or



handwritten (horror!) copies of their articles. Instead, they give me a floppy disk with the article stored on it as a file which can be directly edited and then printed out.

The next advance we are planning is to be able to transmit the text down the 'phone lines. This should be operative within a few months. The advantages are obvious. Communication is instantaneous, without the two-day delay of the mail system, and it's cheaper too; nine cents for a local phone call, versus 24c and more for a letter.

Electronic mail systems are nothing new. Many companies have internal systems. The technology has been around for some time. Large word processing systems often offer electronic mail facilities as an option and large mainframe computer systems can tie in nicely with these systems.

A lot of effort is currently going into the development of high-speed networks for linking office systems, such as computers to word processors. The current front runner seems to be a joint proposal by Digital Equipment Corporation, Intel and Xerox, called Ethernet. This system will allow up to 1024 stations, up to 2.5 km apart, to be linked together in one network to form a fully integrated automated office.

While the Ethernet provides a network facility over an area equivalent to, say, a large factory, many users have a requirement for communications over much longer distances — like Melbourne to Sydney. Such links are easily possible, although the rate of data transfer is necessarily slower, using modems. In the US, for example, the ARPANET (ARPA: Advanced Research Projects Agency of the US Department of Defence) covers right across the country, with linked computers in Europe as well.

Home Communications

In the US, communications facilities for home computers are easily and cheaply available. Modems cost about $150 to $200; $400 would buy a direct-connect model with auto dialling and the ability to answer the phone.

The result has been a boom in the computer communications market. It all started some years ago when Ward Christensen and Randy Suess, of the Chicago Area Computer Hobbyists' Exchange, set up the first Computer Bulletin Board System. They scrounged a lot of the parts, but once they got going on the system they had it up and running on an Imsai 8080, with one floppy disk, running a modified copy of CP/M.

The idea behind the CBBS was this. Anyone could dial into the system and it would respond (once it had worked out their terminal speed) by signing on with an introductory message and asking them to identify themselves. With the formalities completed, the user could go on to leave a message, or browse through the messages on the system, or search for certain keywords in the message titles (your own name, for instance).

Ward and Randy made the software for the CBBS readily available and it wasn't long before CBBSs began to spring up everywhere. People would dial in to leave sale ads, notices of club meetings, requests for help with problems, and so on. There are now CBBSs all over the US and some have begun to specialise; the Apple Bulletin Board Systems, for instance.

But CBBSs are only one step along the road to a remarkably versatile communications system.

A personal Network

PCNET (Personal Computer Network) is a US project to provide a reliable, low cost means of transfering messages or files between personal computers. It has been implemented on a number of computers and, as early as 1978, an 8080-based system successfully sent files to a PET over a noisy line. PCNET stations can not only transmit files on command, they can be left unattended to answer the phone. This means that PCNET users have several advantages over the standard telephone:

- It offers instant transmission of messages.
- It tells the sender the message was safely received.
- It will keep a record on disk of every file transmitted or received.
- It can be set up for unattended operation.

PCNET's personal electronic mail protocol, PAN, has successfully been im-

plemented on the PET, using a TNW-488 modem (which, unfortunately, is not Telecom-approved for use in Australia). However, computer to computer mail has largely been overshadowed by recent developments on the timeshare networks, most notably by The Source.

The Source

Source Telecomputing Corporation operate The Source, a database and timeshare system of considerable complexity that is oriented completely toward the personal computer user. Based in Virginia, The Source runs on a network of PRIME computers which can be dialled up from almost anywhere in the US for the cost of a local phone call.

Once logged onto The Source, a user has access to a vast array of information. First of all, there are several different bulletin boards with special interest categories.

Also connected to The Source are a large number of information sources, such as UPI (United Press International), a wireline service which provides virtually up-to-date minute reports on world news. Much of the information on The Source is of interest to businessmen — stock exchange information is updated hourly.

As well as the data on the system, there are also programming systems, such as a BASIC interpreter and a FORTRAN compiler, as well as other languages. There are also games, of course.

The Source is a look now at what the future holds in communications. A large shareholding in The Source has just been bought by Reader's Digest, indicating the interest of large publishing companies in the new technology. And it's growing at an amazing rate. □

THE SOURCE

Miracles Before Your Eyes Department

The Omen was a film about a nasty little boy who was really Satan's son, Jackal's blood, the lot. But he was a very smart lad. The Exorcist was about a young girl possessed by a demon — who was also very smart. Know-alls are either cast as evil or social cripples it seems. You simply don't admit to being brilliant.

But as KEITH STEWART points out in his story on The Source, a massive data and information network you can hook into, its no more than an endless mine of information that won't cost you your soul. . .

USING PERSONAL computers, equipment which lets a computer use the phone and satellite links are common practises to those in the commercial field. A Sydney Engineer has a modem (acoustic coupler) near his Apple computer at home. His field workers are in mining camps in Western Australia. If they have a problem outside his normal working hours they can wake him up; if he can't provide a solution straight away, he merely links up with the parent computer in the US, works out the problem and transmits the data back to his men in Western Australia in a matter of minutes.

But what does this all mean to you?

It is possible to check on flight schedules anywhere in the world. Book a seat. Charge it to your American Express card, all using The Source.

Stock prices, gold and commodity prices on the world markets are available from your own home at almost no cost, even when the local markets are closed, a boon to those involved in the money markets when the word spreads about The Source.

But this is not of much use to the average person. What is important is that already a user can find out literally anything from the United Press International database or from the Library of Congress database, or that of The British Museum. You can buy, sell or trade houses, cars, boats, take French or German lessons, or teach yourself almost anything using your personal computer.

I believe that personal computers in our homes and offices, linked to major sources of information such as The Source, will create greater social changes than that caused by the introduction of television.

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UTILITY PACKAGES:

SCOPE by Ross Williams

This very handy utility makes searching, viewing and editing memory a breeze. A specified memory block may be looked at in ASCII format and changed with the use of uniquely fascinating 'window' display. If you fiddle with the monitor at all, if you explore machine code programs and wish to cheat in ADVENTURE games, this program is for you! Customise commercial programs to suit yourself, change messages in games such as GALAXIANS and GROTNIK WARS and re-write the Machine Code Tutorial Package! SCOPE comes with detailed documentation which is available free upon request.

Cassette $17.50

SCOTE by Ross Williams

Screen Orientated Text Editor for the Development PAC. How many times have you been frustrated with the editor in the Development PAC. Now you can create your assembly language programs with the aid of a Wordprocessor type editor. Comes with detailed documentation which is available free upon request.

Cassette $23.50

SYSTEM 3 by Richard Swannell

System 3 is the ultimate program development toolkit and is guaranteed to cut your programming and debugging time by half! Once loaded, this program gives your Sorcerer Standard Basic ROM PAC an extra 15 commands, not mentioning a host of other features. The editor itself is simply out of this world!

The following commands are just a sample:

EDIT x,y	AUTO x,y	RENUMBER a,b,c,d
TRACE xx, 'string'	HELP xx	FIND 'string'
DEFINE x	VARIABLES	LIST xx-yy
DELETE xx-yy	CLOSE	OLD
MERGE	CLOAD?	Control P

System 3 loads with a simple LOG command and relocates itself to the top 3K of available RAM. Printer Drivers are included and many of the bugs in the ROM PAC have been healed. Over 500 users have this amazing utility already and wouldn't be without it. System 3 is the most powerful utility for Sorcerer Basic in existence, as well as the least costly. You will find System 3 easy to use, fast, efficient and reliable.

Cassette $29.95

SCREEN GENIE by Don Ursem

Screen Genie is a compact machine language program which can be loaded along with BASIC or Z-80 application programs. By adding only a few POKE statements to your program, GENIE gives you the following: 'PRINT AT' feature, erase of any rows of the display, scrolling of any portion of the screen, inverted and indented printing. SCREEN GENIE comes with a demo program which shows all the features in BASIC language routines

Cassette $15.95
Micropolis II diskette $18.95

HARDWARE

SOUNDPLUG

Many programs written for the SORCERER produce audio output by using the parallel output port. Unfortunately this port is designed to drive logic circuits and connecting a loudspeaker directly to the port can damage the computer. Feeding the speaker via a resistor will protect the computer, but this results in a woefully inadequate sound level if a safe value of resistance is used. The SOUNDPLUG has been designed to solve this problem. It consists of a two stage power amplifier with volume control all fitted inside a standard "D" connector housing. Connect an eight ohm speaker to the RCA audio connector on the SOUNDPLUG and run your GALAXIANS, GROTNIK WARS, SCOPE, EDOS and TOUCH TYPE TUTOR with sound effects! SOUNDPLUG is a direct coupled amplifier and can be used to drive speakers, 5 volt relays and motors, etc. SOUNDPLUG is a must for all Sorcerer owners.

Only $19.50

DISK OPERATING SYSTEMS:

EDOS by Gerrard Neil

For those users having Micropolis 5 1/4 inch Disk Drives, this is what you have been praying for! EDOS is a complete Disk Operating System, fully compatible with the Micropolis model I and II disk drives, and is an affordable link between Exidy Standard Basic and Disks. Now there is no need to re-write all your cassette based BASIC programs in disk BASIC. EDOS allows you to CLOAD them into memory, SAVE them on disk and still run them with ROM PAC BASIC!!

The EDOS software package enhances the STANDARD BASIC ROM PAC with:

Disk Commands		Printer Functions		Miscellaneous Functions	
SAVE	filename,<drive>,<filetype>	PRINTON		OLD	Recover BASIC program
LOAD <G>	filename,<drive>,<address>	PRINTOFF		CALL	address,<param1>,<param2>,<param3> Call machine code routine
FILES	<drive>				
TYPE	filename,<drive>			BEEP	length,frequency - Output sound
SCRATCH	filename,<drive>	Graphics Functions			
RENAME	filename,<drive>,filename2				
HRG	Enable high resolution graphics	GR	Enable low resolution graphics		
HSET x,y	Turn on single point	SET x,y	Turn on a quarter character block		
HRST x,y	Turn off single point	RST x,y	Turn off the above block		

All of the above commands may be used in command code mode and within your BASIC program! EDOS allows you to place your Standard Basic cassette based programs on disk. And as if that isn't enough, gives you the above functions as well as full SCREEN BASED EDITOR!!

Introductory price $45.90

EDUCATIONAL PACKAGES:

TOUCH-TYPE TUTOR by Roy Mercer

Think of the time you could save if you could Touch Type efficiently and accurately. TOUCH-TYPE-TUTOR will have you typing with speed and skill and with as much fun as playing Space Invaders. Your SORCERER has an excellent standard shifted full keyboard virtually identical with any high quality electric typewriter and has a memory mapped video display with superb graphics that allows fast screen animation. AND NOW SORCERER has TOUCH-TYPE-TUTOR, an interactive animated audio-visual teaching programme/game.

How does it work? They say "Watched pot never boils" and watched fingers will never type properly. It is essential to keep your eyes off the keyboard - an impossibility for the beginner or for the self-taught two finger typist. TOUCH-TYPE-TUTOR overcomes the problem by putting the keyboard on your monitor screen. A split screen display shows your typing Exercise on the lower half, while the upper screen displays an image of the Standard Keyboard. As you progress through the Exercise, the appropriate keys are lit up on the screen image, instantaneously prompting the next correct finger movement. Hit the wrong key and it flashes on the screen. A speaker connected to the parallel output port will beep on errors to further reinforce the negative feedback.

TOUCH-TYPE-TUTOR teaches step by step, introducing the keys in a logical manner and indicating the correct fingering – even which shift key to use for the upper case characters. Extra features include a facility to set up your own Exercises for problem keys and the ability to turn off the screen prompt for advanced practice. You will find yourself rapidly improving your speeds as your accuracy increases.

Cassette $18.50
Micropolis II diskette $21.50

MACHINE CODE TUTORIAL PACKAGE by Richard Swannell

Can you really operate your Sorcerer after typing BYE? Where do you look for information on Z-80 machine code programming? If you can programme in BASIC this package will give you everything you want to know about your Sorcerer, with easy-to-understand, lightly written tutorials. Covers such topics as: Monitor Commands, most Z-80 instructions, Hex-Binary-Decimal conversions, RAM and ROM, Source and Object Codes, Assembly Language, Hand Coding, Video and Keyboard Routines, Input and Output Vector Manipulation, Memory Maps, Video and Screen RAM, Graphics and DMA, Cursor Control, Monitor and BASIC work areas, Special purpose 'GO' addresses of the monitor and BASIC ROM PAC, Storage and Linking of BASIC programmes, parallel and Serial Interfacing, Cassette Routines, Sound Generation, No-Stop Keyboard Input, disenabling CTRL C and ESC...which is so much more than you will be able to find in any manual. A set of 8 tutorial programmes designed to show the BASIC programmer what to do with his Sorcerer. This Tutorial Package is more than a purchase, it is an investment.

Cassette $24.95
Micropolis II diskette $27.95

BASIC TUTORIAL PACKAGE by Richard Swannell

This set of 9 tutorials teach Sorcerer Basic to the NOVICE. It is already in several schools where we are receiving extremely favourable comments. Lightly written, entertaining and humorous, this Basic Tutonal Package is ideal for anyone, regardless of age or prior computer knowledge. Let your Sorcerer teach you!

Cassette $24.95
Micropolis II diskette $27.95

GAMES:

GROTNIK WARS by Ross Williams

This is it! A breathtaking 3 dimensional simulation arcade game. We wanted to call it Dynasty, but Ross is determined that a game with a difference should have a name with a difference!

It's a video arcade game that isn't coin hungry. You, as commander of a star ship, must search out and destroy enemy spaceships in 8 galaxies. Of course, you have only a certain amount of energy, and when you fight an enemy ship that is in your galaxy, it may fight back and damage your ship.

The many inovations in GROTNIK WARS make you feel that you are actually piloting the spaceship instead of just hitting keys, but the feature that gives it life is its real-time animation. As you patrol a galaxy, you see a field of meteors passing you, just as if you were moving through 3 dimensional space. Asteroids appear out of the distance and grow larger as they near you, before drifting past. When you steer the ship, the stars outside veer realistically in the opposite direction. Enemy ships appear from above, below or from the side, receding in size as they speed past. But the hyperspace effect (used to move you to a different part of your galaxy) and explosions must be seen to be believed! Never before has there been anything like it for the Sorcerer!

Cassette $19.95
Micropolis II diskette $22.95

GAMES PACK 1

Games include LUNA LANDER by Richard Swannell, RACINg by Paul Balin and WARLORD by John Gibbins. Luna Lander itself has been selling at $11.50 and a game inferior to Racing is currently being sold at $17.95. Both are real time action games. WarLord is an all new strategy game. A combination of BASIC and Machine Code has been used in all three and you will be delighted with the use of Sorcerers unique graphics effects.

Buy now, they would make the ideal Birthday or Christmas present, if you can resist playing with them yourself!

Cassette $17.50
Micropolis II diskette $20.50

GALAXIANS by Martin Sevior

Parents are complaining that they can't use their Sorcerer since the children found the thrills and excitement of the Galaxians.

You can force the children into bed, but will you be able to force the Galaxians into defeat as they dive at you with ever increasing fury. Your Sorcerer's unique high resolution graphics add to the excitement that this game generates. This has proved to be our most popular game.

Galaxians now comes with Sound Effects and Joy Stick control. If you have previously purchased our Galaxians and wish to update to Sound and Joystick, simply send us the Galaxians cassette label and $3.00 (Plus postage) for a replacement.

Cassette $19.95
Micropolis II Diskette $22.95

SORCERER INVADERS by Martin Sevior

This is one of the best Space Invader games you'll ever see on any Micro-computer. Sorcerer Invaders has proved to be most popular and is similar to the arcade game but with the added advantage of not having a coin slot. Simply a must.

Cassette $15.95
Micropolis II diskette $18.95

PROGRAM	PRICE
Postage and Handling $1 within Australia or $2 outside for the first piece of Software and 50c for each additional cassette	
ONE AUSTRALIAN DOLLAR EQUALS 1.14 AMERICAN AND 1.38 CANADIAN — TOTAL	

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SYSTEM SOFTWARE

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WESTERN AUSTRALIA, 6157
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Television is essentially a passive medium. When using The Source, I am in charge and have access to a world of my own choosing.

Suddenly, a real computer power is in private hands and for little more than the cost of a local telephone call.

I first heard about The Source computer facility last year, through a friend in the US. We were writing to each other every couple of weeks, and he suggested that it was a shame that we couldn't keep in touch using 'The Source.'

He then went on to describe some of its features, explaining how easy it was to write a letter on his computer using a text editor, store the letter on diskette, then send it electronically through The Source — its speed and cheapness had obviously made conventional postage obsolete.

At that time no-one in Australia seemed to know anything about The Source. I approached the Overseas Telecommunications commission and asked about data links across the Pacific. It was explained there was an excellent data link called MIDAS, which firms were using to communicate with mainframe computers in the US and with their head offices. Until recently, there was little public knowledge of this facility.

There seemed to be no reason why I could not use the MIDAS facilities to link up the The Source in Virginia. I therefore sent for the application forms.

Some weeks later I received a note from a local firm offering to link me up with The Source, but it proved to be impossible to actually get through at that time. So, some months later when I was in the US, I joined The Source club and have been investigating The Source ever since.

What DO you need

• A Terminal: You don't need much to hook in, but you must have a terminal. However, it does not need to be terribly complicated to access a mainframe computer. The units you see at airline check-in counters and in many bank branches are terminals with little brainpower, connected to a mainframe computer.

● A Modem Or Acoustic Coupler: These units convert the signals recognised by computers into a form which can be sent along a telephone line. They are connected to the terminal and the nearest telephone handset is placed in the modem or coupler's cups.

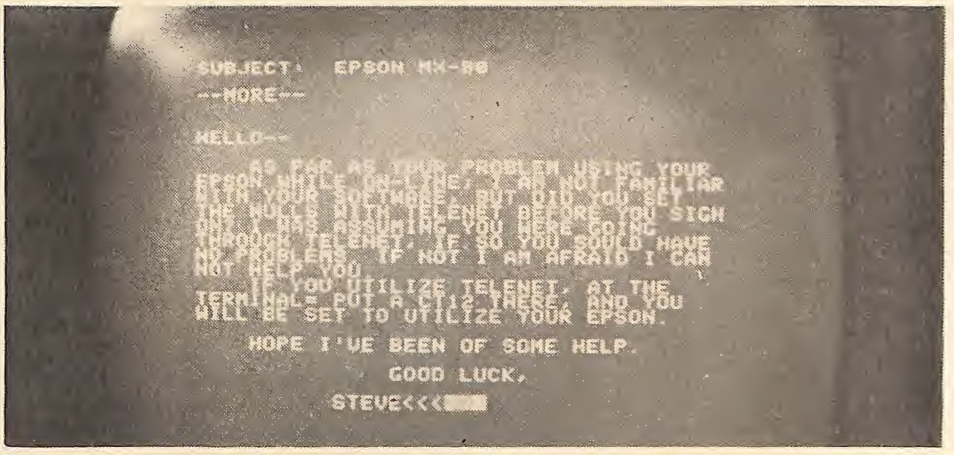
A Telecom-approved modem is produced for Australian conditions by Electro-Med, in Victoria.

Most users in the US turn their personal computers into terminals by loading a simple program which turns the unit into a terminal that recognises the standard codes.

Even some of the simpler computers sold in electronic hobbyists shops can be used as terminals.

Serious business users, however, use the later generation of personal computers, or dedicated terminals, which make communication much simpler and more reliable. A user should not need to be a computer programmer or electronics genius to merely communicate with the US. An advantage of using the later type of computer is the software available is much more versatile and better written.

I bought the American Source package in the US for my Apple, but found it was not really suitable for use in Australia.Then I discovered the amazing ASCII EXPRESS written by Bill Blue and produced by South Western Data Systems. This program turns the Apple not only into a smart terminal but it also has a sophisticated text editor, file storage routines, even the ability to auto-dial when used with certain modems. There is also a version for CP/M users.



The Source, if you'll pardon the pun, is a wonderful source of information.

● Merlin, Eat Your Heart Out

All I had to do, or so I thought, was to load up, dial the right number and talk to The Source. I was wrong.

The first mistake we made, on getting the package home, was to make three backup copies using the copy routine on the disk. This we did because a cursory look at the manual, convinced us, quite wrongly, we would surely muck things up on the first couple of attempts. We quickly realised that we had blown two of the four allowable backups. To limit piracy, the disk crashes after four copies are made.

Then we had to get into a set-up program to configure the ASCII EXPRESS for our particular Apple communications card.

Due to a complete inability to read the small print in a well-written manual, we ended up taking part in a frantic drive to Ian Webster's Micro Works in North Sydney on a Saturday morning to sort it out. We came home with our last remaining copy to hopefully thrill and amaze the group of computer people who seem to materialise in Camden whenever anything new appears on the scene in Australia. At that time there were only four people in Australia who were hooked up to The Source. There are many more today.

Now it was going to be easy, or so we thought.

- Boot up ASCII EXPRESS .....OK
- Dial the OTC datalink number in Sydney .....OK
- Type in our terminal ID and code number .....OK

So far, so good; that got us through in seconds to the US and into Telenet, the American computer network we were to use to get into The Source.

Then we typed in The Source ID . . .OK

We were actually "talking" to a computer in the US from our home!

Then the trouble really began. We were asked to "Type your ID" (You have to type in an ID, followed by your code, followed by the computer bank serial to which you have been assigned. Eg ID WD345 KJUWLO.)

That didn't work! The manual instructed us to use control characters. This we did and it didn't work. We tried every possible combination of spaces and control characters that four mainframe programmers, three maths teachers, assorted computer freaks and a number of innocent bystanders could think of. Still no response. Each failure meant that we had to hang up and start all over again from Australia.

In desperation I looked up the 'help' section in the manual and telephoned the service number in Virginia. A very helpful, if a little bemused, person expressed astonishment that we even had telephones in Australia and determined that as a recent listing, I had been linked up through a new computer bank. We were given its number, and it worked!

Loud cheers spread throughout the house.

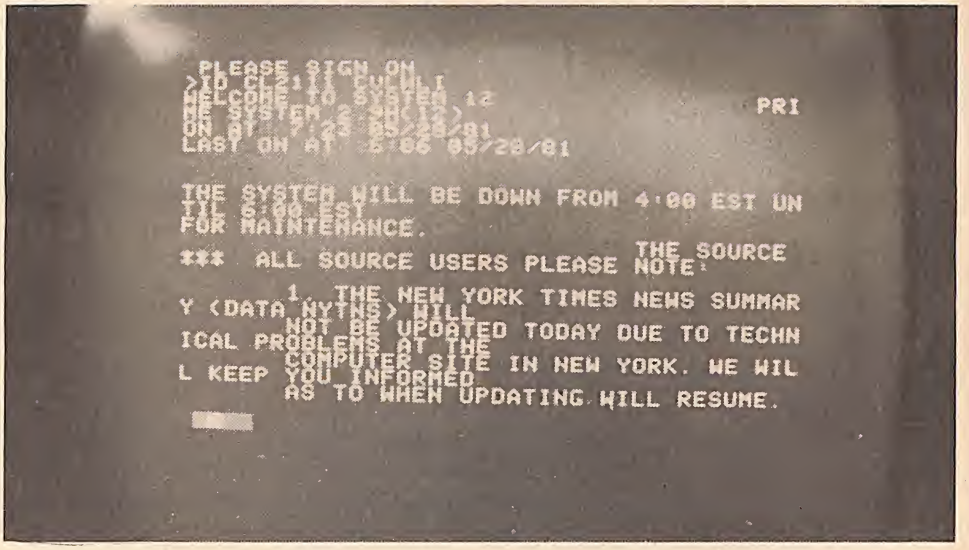
What an amazing experience it was that first time to look at one or two of the facilities of The Source. Of course, we have since become a little blase about the whole thing some six months later. But we are constantly finding new and exciting fields to explore. New facilities are being added every week and we just cannot keep up with them. Many are not directly applicable to us in Australia, unless we want to buy a house in Arizona, or read Jack Anderson's syndicated newspaper column without buying the New York Times. But our link with the world from our local phone is in use three or four times each week. We send letters to people all over the US and Canada — the text goes up the line at 30 characters a second. The letter is printed and posted from Virginia that day.

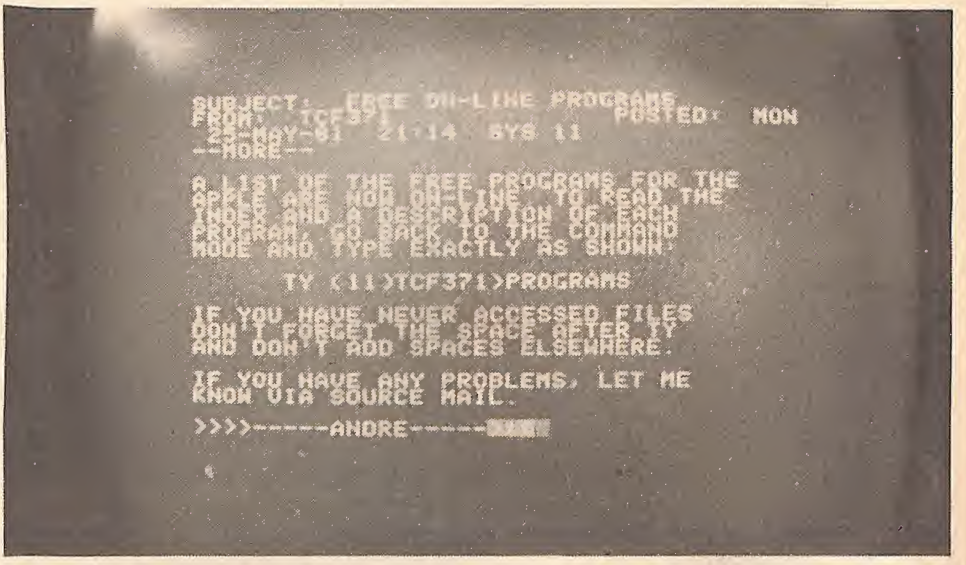
It is even easier to send a letter to one of the tens of thousands of people and firms who are linked to The Source. We merely type up the letter and 'dump' it, electronically, in their 'mailbox'. The next time they look in their electronic mailbox they can read their mail, save it to disk, delete, or even print it out on a printer.

I had some trouble interfacing a new type of printer to my Apple. Instead of bothering the agents here, I merely put a notice on the APPLE BULLETIN BOARD asking for help. Within a day there were 18 replies in my mail box from people all over the US and Canada. Most had experienced the same problem and had come up with the same fix.

My only mistake was in letting on that I was talking to The Source from Australia. Ever since, my personal mailbox in Virginia has been flooded with amazed requests from users all over the world wanting to know how we link with Telenet. □

The thing about the Source is that it's friendly!





Imagine... doing your income tax on your own computer!

WARNING: New higher duty on computers — all of our computers were purchased before the duty increase — so buy now before the price rise!

If ever you've needed a good reason to buy a personal computer, this must be it.
In fact, there are two good reasons!

1. INCOME TAX PROGRAM

For the FIRST TIME IN AUSTRALIA we have available an amazing program which will assist you to do your 1981 income tax return! Just imagine — the computer will check all details, minimising mistakes which could cost you a fortune!
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Cat. X-3762
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2. SPECIAL 'END OF FINANCIAL YEAR' PRICE SLASH

We've sold over 3,000 of the incredible System 80 Computers — making it by far Australia's fastest selling computer. To celebrate this (and to mark the end of the financial year) we've slashed the price by an amazing $55.00. That's $100's less than the equivalent Tandy computer — and it will run most of their programs (huge range available). Take advantage of our direct import prices: no middlemen mark-ups, and we have our own service centre with fully qualified computer technicians!
Don't take chances with 'unknown' computers: save now with the System 80 from Australia's leader in personal computers — Dick Smith! But be quick before prices rise again!

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Both the 400 and 800 are expandable with a host of accessories, and C.P.C. stocks plenty of the superb software available for them, from Star Raiders to Viscalc.
Compare the specifications below or come in and see these amazing machines. Then make sure you secure one while stocks last.

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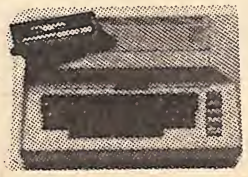
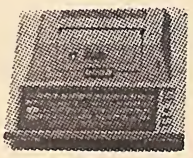


ATARI 800



ATARI 400

$599

FEATURES & SPECIFICATIONS – THE ATARI 800

Console: FCC approved, with built-in RF modulator. Connects to any TV.
CPU: 6502 Microprocessor. 0.56 microsecond cycle. 1.8 MHz.
Colour: 16 colours, each with 8 intensities.
Sound: Four independent sound synthesizers (in addition to audio through TV) for musical tones or game sounds. Four octaves. Variable volume and tone. Internal speaker.
Memory: 16K bytes of Random Access Memory is included. The ATARI 800* may be expanded up to 48K RAM with user-installed 8K or 16K ATARI Memory Modules*. The system includes a 10K ROM Operating System. ROM may be expanded with user-installed cartridge programs.
Keybnard: 57 full-stroke alphanumeric keys plus 4 function keys. Upper/lower case. Inverse video. Full screen editing. Four-way cursor control. 29 graphics keys.
I/O: Serial input/output port for simple connection to peripherals. Four controller jacks.
Language: ATARI BASIC cartridge is included.
Display: Highest graphics resolution 320 x 192. 24 lines of 40 characters. Three text modes.

FEATURES & SPECIFICATIONS – THE ATARI 400

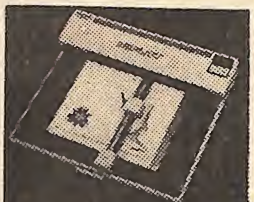
Console: FCC approved with built-in RF modulator. Connects to any TV.
CPU: 6502 Microprocessor: 0.56 microsecond cycle. 1.8 MHz.
Colour: 16 colours; each with 8 intensities.
Sound: Four independent sound synthesizers for musical tones or game sounds. Four octaves. Variable volume and tone. Internal speaker (in addition to audio through TV).
Memory: Two verions – 8K and 16K bytes of Random Access Memory (RAM) included. The 8K version may be expanded to 16K RAM at an authorized ATARI service centre. Both versions include a 10K ROM Operating System. ROM may be expanded with a user-installed cartridge program.
Keyboard: 57 key monopanel alphanumeric keyboard plus 4 function keys. Upper/lower case. Inverse video. Full screen editing. Four-way cursor control. 29 graphic keys.
I/O: Serial input/output port for simple connection to peripherals. Four controller jacks.
Language: ATARI BASIC cartridge is included.
Display: Highest graphics resolution 160 x 96 (320 x 192†). 24 lines of 40 characters. Three text modes.

PERIPHERALS & ACCESSORIES

ATARI 410* PROGRAM RECORDER
ATARI 810* DISK DRIVE†
ATARI 815* DUAL DISK DRIVE (DOUBLE DENSITY)†
ATARI 820* 40-COLUMN DOT MATRIX IMPACT PRINTER
ATARI 822* 40-COLUMN THERMAL PRINTER
ATARI 825* 80-COLUMN DOT MATRIX IMPACT PRINTER
ATARI 830* ACOUSTIC MODEM
ATARI 850* INTERFACE MODULE
ATARI 850* INTERFACE MODULE
ATARI PADDLE (CX 30), JOYSTICK (CX 40) AND KEYBOARD (CX 50) CONTROLLERS AND LIGHT PEN (CX 70)
8K RAM MEMORY MODULE* (CX 852)
16K RAM MEMORY MODULE (CX 853)
ATARI COLOUR (CX 89) AND B & W (CX 82) MONITOR CABLES

* TRADE MARK

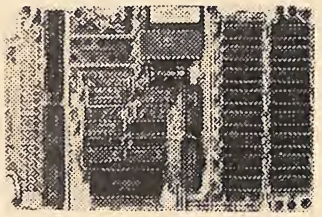
DIGI-PLOT PLOTTER



NEW – THE DIGI-PLOT INTELLIGENT PLOTTER.
Full A3 size and with on-board intelligence, the DIGI-PLOT is controlled by means of simple commands from your computer. Complete character and graphics capability for graphs, plans or patterns.
Interface is 7-bit parallel using ASCII code. Interface cable available for APPLE, TRS-80, SORCERER and COMMODORE. Price includes cable and manual.

DIGIPLOT: $1350.00 ex tax
$1495.00 inc tax

PET/KIM 32K RAM EXPANSION



Compatible with the Commodore PET, KIM, AIM and SYM computers, this is a new board giving 32K RAM expansion. All RAM is supplied, fitted and tested, and the unit is ready to connect.
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Apple II Plus 32K	1372.75	1577.00
Apple II Plus 16K	1325.25	1524.00
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Disk II Add-on	515.80	594.32
Pascal Language System	470.25	540.80
Pal Colour Card	166.25	191.20
Integer Basic Card	190.00	218.50
80 Column Card	400.00	460.00
CCS Parallel Interface	220.00	253.00
RF Modulator	35.00	39.95
Sanyo Green Screen Monitor	305.00	340.00

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A complete computer aided instruction package designed to allow you to construct your own tutorials in any subject. Questions can be linked to graphics for diagrams. Incorrect answers can lead student on a chain of further questions to illustrate the reason for mistake. Marvellous teaching aid.
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SOFTWARE

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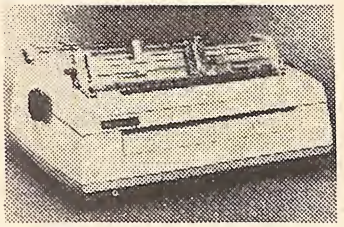

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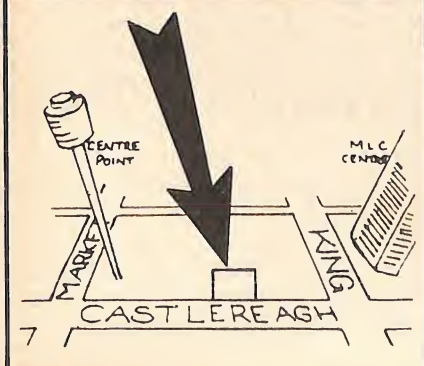

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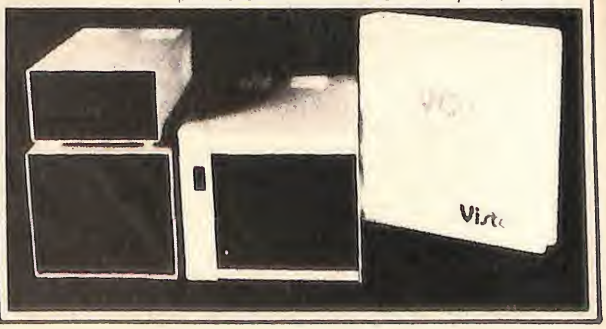
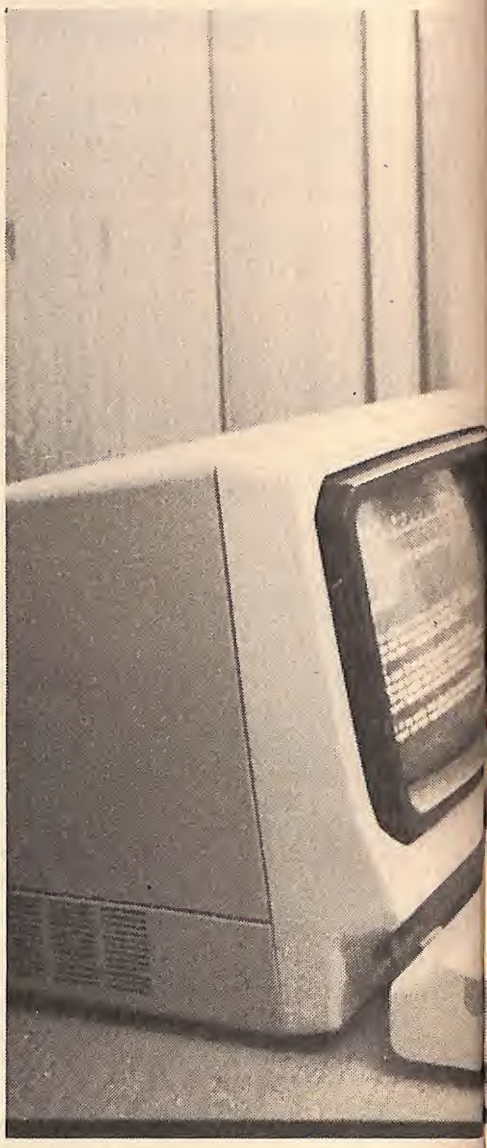


The paperless office is a myth; there will always be some paperwork to do, but the question a business should be asking itself is: "How much of it should be done by hand?"

MARK CAMM discovered that in the world of dedicated word processors, paperwork doesn't disappear, it gets done far quicker and more accurately (and it doesn't put people out of work).



ANYTHING YOU CAN DO IT CAN DO BETTER

and faster and more accurately and cheaper

HOW MUCH do you think it costs to produce a single business letter? A few cents? Perhaps a dollar?

Think again — it costs around $8, according to a report commissioned by the Myers committee of Inquiry into Technological Change in Australia.

Technology, that harbinger of doom or paradise found (it depends on your outlook), has seen labour costs in the US take up 84 per cent of an American office's overall costs according to figures in the report, called the Word Processor Industry in Australia. It says that in the US, productivity in the blue-collar side of industry has risen by 90 per cent in the past decade. Office productivity? A mere four per cent.

The report is mandatory reading for any business manager who has seen cost and labour-saving schemes pass through the office without the slightest impact on the bottom line of the profit and loss sheet. Technology, then, is perhaps the only answer to a business problem in what is today a very unconventional business world. These days, it is not using the blank side of scrap paper which saves money, and it is not making employees work harder, for longer and for less money: it's simply making the business and its administrative functions more efficient.

The report does not say, "Save your business, buy a word processor." But it hints at it; and like it or not, it is probably right.

Most businesses, from the one and two-man legal or medical practices, to the plumber with half-a-dozen employees, right up to the large offices which take up a floor of a skyscraper, produce huge amounts of paperwork.

How many times have you said to yourself: "If I could get rid of some of this

paperwork, I could make this business better"?

You could, in the words of one word processing consultant, do what a manager is supposed to do: manage.

The danger is in buying the wrong equipment, or a word processor which does not do the work you bought it to do. There are many horror stories of business people spending tens of thousands of dollars on computer and word processing equipment, only to discover that once the cheque has cleared, it's found the equipment has some very nice features, but too few of the features which would make it cost effective.

Maggie Farago, a word processing consultant with the Qube Management Group in Sydney, is familiar with many of the horror stories. She does not advocate a word processor for every business. But it's no surprise that she *does* advocate seeing a consultant before making a decision.

"There are horror stories because managements have no expertise," Ms Farago says. "Buying a word processor is not like buying a typewriter."

Pub Talk

She says people buy a word processor because the business has "a need, a problem to overcome , and because often a mate in the same business, is using one successfuly."

It does go deeper than that, of course, but many business people do delude themselves into thinking an emotional decision was made on very practical and justifiable grounds.

According to Ms Farago, the key to the decision is to simply ask; "What does the business need?"

She says it is almost impossible to offer general advice on buying a word processor, because every business and its operations are different.

There are, though, some very good questions you should be asking yourself:

- The company you plan to buy the word processor from — are you sure it's a reputable business? Says Ms Farago: "It's very nice having a big company in America, but they must have a branch nearby which can support the installation."
- Will the word processor be out of date in five years? Will it get the benefits of future updates?
- Will the equipment be easy to use? It's no good to you if you have to give it complicated commands for simple procedures.
- Will the word processor allow information to be easily retrieved from it?
- Why is the business looking at word processors?
- In five years what direction will the company be going in?
- What suppliers are going to be around in five years?
- Will the company need WORD and DATA processing?
- What kind of information storage will the company need now and in the future? Says Ms Farago: "Can extra storage be added on later, or does it die at floppy disks?"
- What kind of printer will the company need? Quality or speed or both?
- If the company has branch offices, will the word processor system be capable of communicating between them?
- Does the company want to use the word processor as a telex?
- Does the company need phototypesetting to be included in the word processor's functions?

These are just some of the questions a consultant puts to a business before advising it on what word processor system would most suit it. There are many more, but they lie more in the field of management consulting, this looks closely at what the business does, how it operates — how efficient or well-managed it is.

Another word processor consultant put it this way: "I am called in not to select equipment, but to see what people need."

There are many versions of word processors. Electronic typewriters with a small memory are word processors of sorts; even a blunt pencil is a word processor.

The most easily recognised version is the word processor made up of a TV

WORD FACTORIES Part II

monitor, a keyboard, the disk(s) drive (s) — for storing information — and the printer.

Dedicated word processors (dedicated, because it is the processor's only function) are expensive. Where do you go for help and advice?

If you were buying a $15,000 car, many organisations could help and advise you on the purchase. The same goes for houses, insurance, health and even buying a wig. But for word processors?

You have two choices: the word processor salesperson, or the word processor consultant.

In both fields there are people of integrity, honesty and good faith. There are also liars, charlatans and those whose only motive is profit.

Finding someone to give good, sound advice shouldn't be on the recommendation of a mate in the pub, but it often is.

If there is no-one in your business with word processing experience, you would be wise to ask a consultant to help. Better still, you could spend some time to learn about word processing and make your own decisions on a basis of knowledge, not hearsay and the old-boys' network.

The Trusted Ones

The International Word Processing Association's Australian branch is a forum for learning about word processing.

Its president, Mr Morris McLeod, is not keen on the association being used as a clearing house on business enquiries, about whether this consultant or that manufacturer can be trusted.

What the association will do, he says, is offer its members "a better understanding of word processors." Regular meetings and education classes are its main function, but the association will supply a list of those consultants who are members.

The association's address is Box 298, Royal Exchange Post Office, Sydney, 2000

What most salespeople will not tell you (and if they are smart, they never mention the subject) is that most word processors are good. The industry is so competitive, rubbish soon dies.

Richard Sobcyak, a Sydney consultant, regards the "bottom line" as one of the most important factors when looking at word processors.

"The good processors are overpriced for what they do," he says. "So you have to work out very carefully what your cost benefit is going to be."

He is adamant that it's "homework first, buy later." The success of a word processor depends very much on management; equally important is that staff must know from the beginning what is being planned.

"Many businesses are stupid. They buy equipment like they buy a car — colour, look and whether they like the salesman," Mr Sobcyak says.

The story doesn't end with buying the word processor. There are, in the jargon of the industry, consumables to buy — printer ribbons, diskettes and such unlikely things as daisywheels.

A spokesman for Computer Supplies (Australia) Pty Ltd, Mr Roger Harris, says he is somewhat perplexed by the "consumables" market.

It is an area hardly anyone thinks of until it's needed, he says.

"I find it infuriating that printers are built with a ribbon no-one can supply — except the manufacturer, who charges like a wounded bull," Mr Harris says.

The average price of a diskette is about $5, "but some manufacturers sell them for about $16 because they have a format no-one can decipher."

Mr Harris says the supply and cost of consumables is an important factor when deciding what machine to buy.

An intriguing side to the word processor story is the bureau — this is the business that does the work for you, whether it be form letters, invoices or preparing contracts.

You would think a bureau would be the mecca for very small business which could not justify the cost of a word processor. In part you would be right; small businesses are a bureau's bread and butter.

But, according to Mr Ross Hancock, of Office Support Services, big business is a very good customer.

The work they present the bureau is often as not strictly confidential material they don't want anyone back at head office to know about. For example, there may be implications of staff cuts; what better way to hide the matter for as long as possible than to get a bureau to prepare the material for you?

All very hush hush, exciting stuff, but according to Mr Hancock the mundane and routine job is the norm; the "little guy" who might spend $30 a month.

The main benefits of using a bureau, he says, is that there is no capital outlay. Office Support Services uses a Vydec system, which is able to do a couple of hundred hours work in a week. It pays for itself.

"A business would have to spend upward of $400 to $600 a week with a bureau before thinking of a word processor," Mr Hancock says. And although some consultants disagreed with him, asking how it is possible to work out a "cut-off" point where a word processor is or is not feasible, the figure is a good

Maggie Farago of Sydney's Qube Management Group ...more to it than buying than a typewriter.

indication of the average, total running costs of a single word processor, including the initial buying price.

Drake Overload in Sydney is another business that operates as a bureau, although the company is probably better known for finding you an employee rather than doing the work for you.

A spokesman for the company, Mr Phillip Goldstein, says the word processor used (a dated but effective mag card IBM) has not "justified itself in cost, yet; management in the company is just beginning to realise how to use its potential."

But, he says, it has been a boon to the secretaries "and the whole organisation."

Mr Goldstein was one of a number of people who refuted suggestions that word processors put people out of work. It relieved typists of mundane typing tasks, he said, with the benefit that often they were retrained to operate the word processor, a skill increasingly in demand.

Employment impact

The report to the Myers Committee of Inquiry suggested, and people in the word processing industry confirmed, that the only impact word processors have on the employment market is to make it harder for typists to find work.

Strangely, many typists have refused company offers to retrain on word processors and have subsequently lost their jobs. The logic behind the refusals to retrain is impossible to unravel; apparently, many secretaries and typists are afraid of "computers" and see them not as an opportunity for gaining extra skills, but as a threat to their jobs. What is apparently impossible to get across to many of them is that if they don't retrain, the skills they have now will become increasingly worthless.

The main problem is that management presents word processors to secretaries as a *fait accompli*. No education, no discussion, no involvement. If you didn't know what was in store for you, wouldn't you say no? The picture is entirely different if handled properly.

Two of the women who work for Office Support Services are part of the new wave of office worker. Both were secretaries, but took the opportunity to retrain on word processors.

It's fair to say the business revolves around their new skill and efficiency.

Maggie Farago from Qube Management extols the virtues of word processors even further.

By releasing the typist or secretary from the mundane and killing workday of typing and little else, and by freeing up the manager from paperwork, two things happen: the manager becomes far more effective in controlling and improving the business, while the secretary or typist, because of their new skills, are given more managerial responsibility and a voice in company matters.

A Vydec word processing system very hard at work at Office Support Services, a Sydney word processing bureau. The operators would rather be word processors than typists.

But paying the secretary or typist more for her word processing skills and extra responsibilities is a very tender point with many employers.

The report says that in October, 1979, there were 9500 word processors in Australia; by 1985 there are likely to be 80,000; ". . . an eight-fold increase in installations in six years."

The report says that, in 1978 there were 14 firms supplying word processors and associated equipment. In January 1979 there were 15, and by September of that year the figure had grown to 25.

Today more than 50 companies are selling word processors.

For all the benefits of word processors, the report points out that working conditions for operators have not been examined closely.

Continual staring at a video screen can cause eye strain, according to the Federated Clerks Union.

From my own experience of having used Visual Display Terminals while working for newspapers, and, later, VDTs attached to microcomputers, I found there are problems in using word processors:

- Eye strain from focusing to a screen, a page of copy and back again for many hours (cured by special VDT eye glasses and adequate, regular rest breaks).
- Back problems from sitting in the one spot for hours (cured by using office chairs with good back support).
- Problems from having the keyboard fixed permanently to the screen. The better systems allow the operator to move the keyboard to a position that is most comfortable.
- Glare from the VDT screen (fixed by using glare guards, or using VDTs which can tilt).
- Noise. Strangely, some systems are noisy (air-fans cooling electronic components usually being the culprits) but it is the printer which is the most annoying. Adequate soundproofing is often needed.

The report says that a typist finishes a rough draft far quicker than a perfect copy.

"An average typist with a burst speed of 60 words per minute is commonly reduced to about 10 words per minute when she must accurately interpret information and take great care under pressure," the report says.

"Obviously, a word processor, in allowing mistakes to be undetectably expunged and format to be altered, can permit much greater average typing speeds and potentially greater productivity.

"Indeed, it has been postulated that this aspect of the word processor alone should lead to productivity increases of about 100 per cent."

And, the report concludes, this ability is not only the province of the expensive machines but "just as applicable to small offices producing non-standard docu-

WORD FACTORIES Part II

ments and using the cheapest stand-alone word processor."

THE WORD PROCESSORS WHO'S WHO...

Many manufacturers have entered the intensely competitive field of word processing equipment. As a new model enters the market, technology advances so rapidly that the new model is almost out of date as soon as it hits the showroom.

There's an old philosophical theorem that if an infinite number of monkeys were sat down at an infinite number of typewriters, in time they would produce all the great works of English literature.

Delving into the questions and problems of word processors makes you feel just like one of those monkeys; the subject is extremely complex and variations on them are almost inexhaustable.

In this part of Word Factories II, Your Computer *looks at some of the word processors currently being sold...*

THE WORD Processing Industry In Australia report commissioned by the Myers Commitee of Inquiry into Technological Change in Australia put word processors into four categories after exhausting itself on writing down its title:

Memory Typewriters. The report classified these as word processors with a few characters of memory, and basic, automatic editing functions. It conceded there were sophisticated versions which used magnetic cards or tape or mini diskettes, and advanced models which used floppy disk storage and a daisywheel printer. The report quoted prices as ranging from $2000 to $9000 for the advanced versions.

Stand-alone Visual Display Units. The report found that these mainly consisted of five components — a micro processor, a text storage facility (usually floppy diskette), a keyboard, a TV monitor and a fast, high-quality printer.

It concluded that these systems offered a better editing capability, ease of use and versatility than "blind" memory typewriters.

The report found that the printer was usually separated from the terminal, which allowed the operator to print one document while editing another. Each diskette could store between 60 and 120 pages of text and could be randomly accessed quickly and easily.

The report put the cost of these systems at between $10 — 15,000.

Shared Logic Visual Display Systems. Here, the report found, a typical system consisted of two or more "working stations" sharing the same memory and associated equipment (peripherals) like printers.

These systems, it said, had greater on-line memory and more advanced editing facilities. Several operators could work from the same storage simultaneously, avoiding having to duplicate files.

Prices here began at about $23,000.

Text Handling Systems. The report said that these were mainly software (computer programs) packages sold by computer mainframe sellers. Its benefits were that it gave enormous data processing capabilities as well as word processing.

This system is usually adopted by companies which already have a mainframe computer at work.

But there was one category the report did not examine, because it cannot be classed as a dedicated word processor:

The Microcomputer. A fault with dedicated word processors is that their one function is to process documents and words. A few, very few, offer add-on programs, but as a rule of thumb, it's word processing and nothing but word proces-

Wang's powerful System 25.

sing; it's this lone ability which makes the question of cost-effectiveness a vital one to ask — the cost of these dedicated machines is enormous.

A microcomputer, such as the TRS-80, System 80, Apple, Commodore and so on, is cheap by almost any standard. By spending several hundred dollars more on disk drives (if the system doesn't already have them), up to $500 on a word processing program and anything up to $6000 on a printer (though there are some very good ones, including electronic typewriters, which are much cheaper), you have a word processor for a fraction of the cost of a dedicated machine.

Some would say the comparison is like cheese and chalk, and it's a valid point — the dedicated machines are, mostly, much quicker in processing words and documents because of easier to use and learn command keys. The question of document quality rests solely with the printer used. You could buy a $10,000 dedicated machine and a $700 printer and end up with exactly the same document quality as a $2000 microcomputer using the same printer.

If the comparison is indeed chalk and cheese, the subject must also be considered far from black and white. It's probable there are some businesses using a dedicated machine which could get by satisfactorily with a microcomputer system, and vice versa.

A microcomputer can be a word processor, a finance handler, play games, talk to the world, and is programmable. It is more versatile than a dedicated word processor in many instances.

But just as good?

THE DEDICATED

An at-a-glance buyers' guide, NOT a what-you-should-buy guide, to dedicated word processors offered by some of the better-known manufacturers. Because each system offers a rich variety of features and options, we won't even try to cover them all here.

Remington

According to Ms Anne-Marie Tatum, a word processing manager with Remington Office Machines Pty Ltd, a dedicated machine's best point is "its ease of operation; plus it does its work very quickly."

The Remington systems, one of the most popular being the NBI 3000 series, are document oriented and give automatic document assembly as well as a table of contents — very important to engineers, for example, say Ms Tatum.

As with most dedicated systems, the NBI 3000 series offers an impressive list of features: automatic carriage return, indenting and centreing, one command paragraphing, a phrase dictionary, a 240-character typing line, horizontal scrolling, automatic pagination, footnote control and outline format and very sophisticated editing facilities.

The NBI 3000 can be bought as a stand-alone system, or a dual system where two keyboards and screens share a printer. The NBI System 8 allows you to build up a huge network of keyboards, terminals and printers, and is fully compatible with the NBI 3000 series.

The NBI series can handle correspondence, statistics, reports and long documents, techincal and scientific typing,

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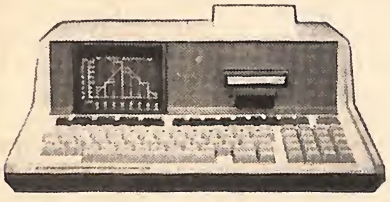

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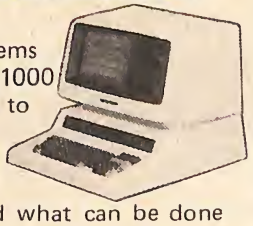
Three Sord 5¼" Systems — starting around $11000 with software exactly to your requirements, stationary, full installation and training — You will be surprised what can be done on the Sord!



Three Diablo 8" Systems — starting around $20000. The 'Rolls Royce' of small computers with individually customised software to match, including new real estate and insurance brokers packages.

Calculator & Computer DISTRIBUTORS

New showrooms
3 Rowley St.
Seven Hills NSW 2147
Phone (02) 624 8849 8.30 to 3.30

WORD FACTORIES Part II

form letters, fill in forms and talk to "remote"terminals using telephone lines.

Prices begin at about $10,000, with the printer (a Diablo) beginning at about $1400. As you build up the system, though, it costs more.

Lanier

Peter Snedden from Lanier (Australia) Pty Ltd is another who stresses a word processor's ease of use. The Lanier processors, along with other processors, uses "function" keys to make operating easier, and quicker.

The three Lanier systems, stand-alone, shared and cluster, use components that are all interchangeable. You can begin with a stand-alone, and if pressure of work demands it, simply add on more terminals or printer.

Prices begin at about $13,000, which includes a Qume printer.

Again, as with most word processors, Lanier offers an impressive list of features. Editing is done on the screen, and mistakes can be simply typed over. The 254 character-wide page can handle a range of statistical documents, while the small magnetic disks can store between 25 and 40 pages of text (about 70,000 characters).

Lanier also offers what it calls "smart" disks for specialised typing needs, such as putting together a mailing list.

According to Mr Snedden, Lanier's priority is with software, and offers 14 different packages, including a maths master, communications package, invoicing and a sophisticated financial package. It, like Remington and others, is adept at scientific languages.

The system is made in Canada, but according to Mr Snedden has "significant local content."

Wang

Wang is one of the recognised leaders in computer and word processor technology, so it's no surprise its offerings on the market are many and varied.

A public relations consultant for Wang, Mr David Tennant, says the systems are based on "professional, productive and cost efficient solutions to your paperwork problems."

There are many variations on the Wang theme, beginning with the Wangwriter, a stand-alone text editor. This system comes with a Wang Daisywheel printer.

It offers excellent editing facilities, according to Mr Tennant, but can also be used as the first step in building up to a bigger system.

Wang offers other systems, very originally named System 5, System 20, System 25, System 30 and Office Information Systems (OIS).

The different systems allow for a shared or cluster network and each offers a proportionally more powerful ability to process documents.

There's also a wide variety of software options, but for sheer size, the Wang OIS 145 wins — anything up to 32 peripherals can be used, including 24 "workstations". intelligent printers, typesetters, optical character readers, mag card readers and others. Storage capacity can be upgraded to 835 megabytes, or more than 800,000 pages of text.

Not one for the local corner store.

Sanyo

Sanyo isn't only a female singer standing on a skyscraper singing "That's Life"; it's also, says Mr Roger Price of the company's office machine division, an up and coming contender in the word processor market.

Its WPS 3000 word processor costs about $10,000 and is hooked up to a Diablo printer.

Mr Price says that although the system is page oriented, page length is more than 400 lines. It automatically paginates. The WPS 3000 comes with a mailing list, and will soon be available with a mathematics and statistical package.

The dual disks can each store 133,000 characters. Also of interest is the Sanyo MBS 3000, a "business" microcomputer which can be bought with word processing software.

"The WPS 3000 has all the word processing features," says Mr Price, "including heavy text editing . . . a specific button for a specific job."

Wordplex

At a starting price of about $12,000, Wordplex word processors can build to a massive system where up to 24 terminals and 12 printers can be used.

The marketing manager for the Sigma Data Corporation, distributors in Australia for Wordplex, Ms Susan Hitchener, describes buying a word processor as a realisation that "all business suffer the same dilemma of time and cost."

"You've got to be intelligent about any tool you bring into the office," she says.

The page-oriented machines have had an excellent sales rate, according to Ms Hitchener. The software for all the systems does not change, a bonus for system compatibility.

The Wordplex 1 and 2 word processors operate as stand-alone systems, but can be added to a shared resource, multi-station system.

The main advantage of using a "shared resource" system (which, in Wordplex's case, means many terminals working through a central processing unit) is that different departments in a business can have the benefits of word processing simultaneously, but each department's files are security protected.

All Wordplex systems have sophisticated editing facilities, and the variety of uses is almost endless.

The advanced Wordplex 7 system, for example, can produce newsletters, data sheets, mailing lists, financial reports and many other complicated document functions.

Mind you, it's not alone in this ability; most of the advanced word processors and multi-user systems share similar features.

Wordplex offers many packages to suit different businesses. Because the systems offer shared logic, they allow a small business to gradually build up a word processing "network" as the amount of work demands.

AM Jacquard

One of the more popular word processors in Australia, a spokesman for the distributors, Computer Resources, Sydney, said Jacquard had about 25 per cent of the market.

The basic system consists of a central control unit, a TV monitor, a keyboard and twin-disk drives.

Among the system's formatting abilities is automatic headers and footers and on the editing side vertical and horizontal scrolling, automatic aligning, merging and document assembly, a hyphenation scan and a global search and replace facility — if you've spelt a word wrongly all the way through a piece of text, you do one correction and the processor does the rest.

The Jacquard 500 is the stand-alone word processing version of the company's J100 microcomputer. Both can handle word processing as well as data processing.

The 500 is supplied with a built-in communications package, so that if you add to the stand-alone system, it's simply a matter of plugging the extra bits in and all can "talk" to each other immediately. The 500 also has a BASIC compiler, which allows the user to create special software programs.

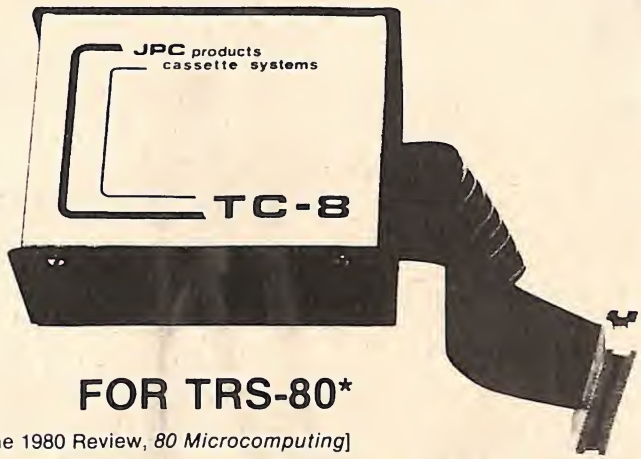
According to Computer Resources, Type Rite software (Type-Rite being the unoriginal name given to the range of Jacquard processors) can store on floppy disks, hard cartridges or disk packs up to 320 million characters.

Continued on page 56

DEFOREST SOFTWARE

HIGH SPEED CASSETTE SYSTEM

Poor Man's Floppy



FOR TRS-80*

Now the widely acclaimed JPC Cassette System is available for your TRS-80* computer.
The price is only $120.00

TC-8 Cassette System
Kit: $120
Assembled: $150

[Reprint of June 1980 Review, *80 Microcomputing*]

by Carl A. Kollar

I guess I don't have to tell any TRS-80 owners how frustrating the cassette system that comes with the computer can be. Even with the factory mod that's available, the annoyance of loading and checking programs becomes just barely tolerable.

If you're like me, after you've just plunked down a chunk of money for a Level II 16K machine, "you ain't got nuttin left" for even one disk drive at 500 bucks apiece. So you suffer.

A reasonable alternative is the Exatron Stringy Floppy (ESF). This will cost you about 350 bucks and totally eliminates your loading and saving problems, automatically and fast. I've had one of these for about six months and love it!

But, if the price is still too steep, have I got a device for you!

The Device

The February 1980 issue of *Microcomputing* had an ad that intrigued the hell out of me. It was a high-speed cassette system by JPC Products acclaimed as a "poor man's floppy." It made all sorts of seemingly ridiculous claims such as "loads five times faster," "stores 50,000 bytes on a 10-minute cassette," "less than one bad load in a million bytes with the volume control anywhere between one and eight."

All this for a measly 120 bucks? How could this be? A call to Albuquerque answered a few questions: Yes, it had its own power supply, and, it stored programs five times faster because it utilized higher density data. The computer outputs the information at a higher rate out of the rear keyboard connector.

The ad had even claimed anyone could build it even if you have never soldered before. JPC would make it work, if you couldn't—for free. I was sold. I placed my order, and it arrived about two months later (parts shortage).

I work in electronics, so I found the unit exceptionally easy to build. It took about an hour. The manual is superb. (That's better than great.) It was clear, concise and exact with no ambiguities. Important parts placements are stressed (polarity markings on electrolytics, bands on diodes, etc.).

JPC was right! With these instructions, you couldn't go wrong. The board quality is excellent. It is double-sided and parts locations are clearly marked on the component side of the board. There are no jumper wires to install. JPC utilizes PC traces and plated-through holes for connections to traces on the other side of the board.

Also, there are absolutely no adjustments or settings to bother with.

The documentation is a sheaf of 8½ × 11 papers stapled together. It is written in the nicest format I've seen in a while. Each command and/or subjects is covered on its own sheet in large type. All explanations are in easy to read English—not computerese.

Commands and Features

SAVE"filename": Saves your BASIC program on cassette.
LOAD: Reads the next BASIC program from the cassette.
LOAD"filename": Searches for and loads the specified file from cassette.
LOAD? and LOAD?"filename": Reads file from cassette, and compares contents to memory.
LOADN: Prints a list of all the programs on a cassette, until interrupted by the "break" key.
LOADN"filename": Same as above except the tape will stop at the end of the program named.
KILL: Removes the file manager program from memory so that the extra memory can be used by large programs.
RSET: Allows the operator to rewind and position the tape on tape recorders that have these functions tied to the motor control jack.
RUN"filename": TC-8 searches for a specified program and runs it immediately.
PUT"filename": Same as SAVE "filename", except it is for use with system tapes.
GET: Same as LOAD, except it is for use with system tapes.
GET"filename": Same as LOAD "filename", except it is for use with system tapes.
GET? and GET?"filename": Same as LOAD? and LOAD?"filename", except it is for use with system tapes.
GETN and GETN"filename": Same as LOADN and LOADN"filename", except it is for use with system tapes.
OPEN: Required before cassette input or output of a data file can be attempted.
CLOSE: Required to end a cassette data file.
PRINT#: Allows numerical or string data to be output to a cassette file.
INPUT#: Allows numerical or string data to be input from a cassette file.

I haven't counted them, so I don't know about the "one load in a million bytes" claim, but my son, Anthony (age 11), loaded about 30 of his programs from his Radio Shack format tape to a new TC-8 format tape. He's run them all and found no bad loads.

Unlike the standard tape system, you can position your tape anywhere before the program you want and not have to look for a blank spot between programs. The TC-8 patiently waits for the program you want and then starts loading without getting confused by the portion of the previous program you just fed it.

Try that on your regular cassette system; you'll wear out the reset button. ■

ORDER NOW

To order your TC-8 kit, send your cheque or money order for $120.00 plus $3.50 postage and handling to DEFOREST SOFTWARE, 26 Station St., Nunawading 3131. Credit card orders accepted by phone or mail. Personal cheques will delay shipment. We will otherwise immediately ship you the TC-8 kit, the cabinet, the ribbon cable, the power adapter, an instruction manual, and a cassette containing the software.

SEND SELF ADDRESSED ENVELOPE FOR OUR NEW GIANT CATALOGUE

★★★★★★★★★★★★

SPECIAL
"DEMO"
MODEL 1 16K
COMPUTERS
only $900

★★★★★★★★★★★★

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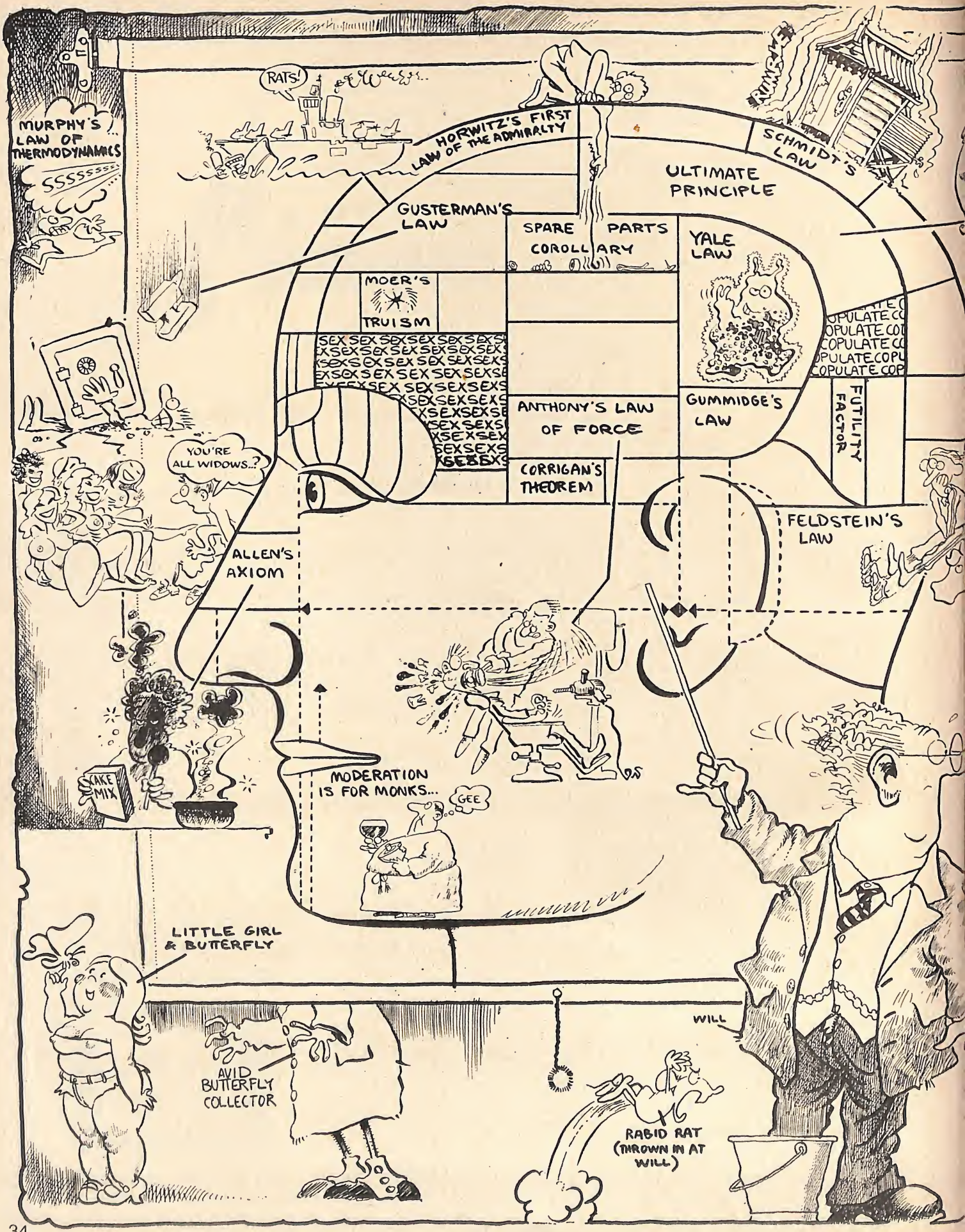
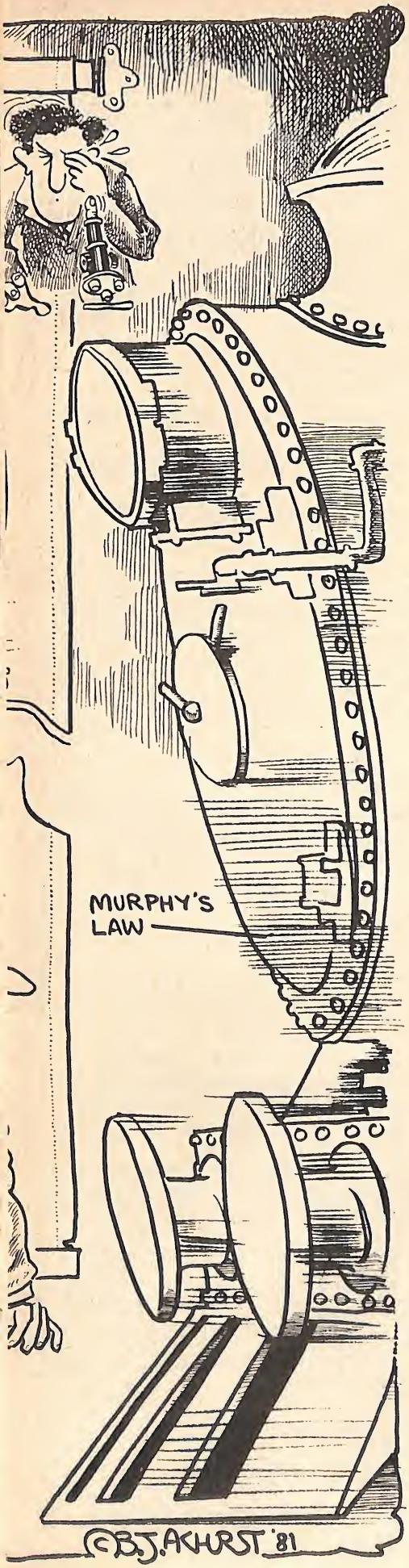

MURPHY'S LAW OF THERMODYNAMICS
SSSSSSSS
RATS!
HORWITZ'S FIRST LAW OF THE ADMIRALTY
SCHMIDT'S LAW
ULTIMATE PRINCIPLE
GUSTERMAN'S LAW
SPARE PARTS COROLLARY
YALE LAW
MOER'S TRUISM
SEX SEX SEX SEX SEX SEX
ANTHONY'S LAW OF FORCE
GUMMIDGE'S LAW
FUTILITY FACTOR
CORRIGAN'S THEOREM
FELDSTEIN'S LAW
YOU'RE ALL WIDOWS..?
ALLEN'S AXIOM
CAKE MIX
MODERATION IS FOR MONKS...
GEE
LITTLE GIRL & BUTTERFLY
AVID BUTTERFLY COLLECTOR
WILL
RABID RAT (THROWN IN AT WILL)



Ever been stuck for an excuse? Never been able to put into words just why nothing goes right? Lost for a reason when something unreasonable occurs? Puzzled by all that happens about you? Curious as to why something that shouldn't happen invariably does? Join Your Computer *in plotting the answers to these questions, and many more, in this selecion of trueisms, quotes and homilies stolen, filched and plagiarised from people, places and magazines you've never heard of.*

THE REAL LAWS OF LIFE...

Logic, that great cornerstone of our society, has absolutely nothing to do with day to day reality — it's all a plot begun with Plato and carried on by Norman Gunston and Sartre to convince us that one and one does make two.

It doesn't, never has, never will, but if you try to program your computer to work it out, it'll explode.

Computers work solely with logic, but logic has nothing to do with:

Murphy's Law: If something can go wrong, it will.

Murphy's Law of Thermodynamics: Things get worse under pressure.

Anthony's Law of Force: Don't force it; get a large hammer.

Yale Law: Under the most rigorously controlled conditions of pressure, temperature, volume, humidity, and other variables, the organism will do as it damn well pleases.

Horwitz's First Law of the Admiralty: A collision at sea can ruin your entire day.

The Golden Rule of Arts and Sciences: Whoever has the gold makes the rules.

The First Rule of CP/M Alteration: CBIOS's for 32K CP/M aren't.

Weiler's Law: Nothing is impossible for the man who doesn't have to do it himself.

Fitzgibbon's Law: Creativity varies inversely with the number of cooks involved with the broth.

Chisholm's Law: Any time things appear to be going better, you have overlooked something.

Shanahan's Law: The length of a meeting rises with the square of the number of people present.

Finagle's Law: Once a job is fouled up, anything done to improve it makes it worse.

Rerdin's Law: In a crisis that forces a choice to be made among alternate courses of action, most people will choose the worst one posible.

Ross's Law: Never characterise the importance of a statement in advance.

Salinger's Law: Quit when you're still behind. When you're in a hole, don't dig.

Allen's axiom: When all else fails, read the instructions.

Patrice's Theorm: If the experiment works, you must be using the wrong equipment.

Skinner's constant: That quantity which, when multiplied times, divided by, added to or subtracted from the answer you got, gives you the answer you should have got. (Also known as Finnegan's Finagling Factor).

Homer's Five Thumb Postulate: Experience varies directly with the amount of equipment ruined.

Gusterman's Law: The probability of an event occurring is inversely proportional to its desirability.

Timely Order Principle: Those supplies necessary for yesterday's experiment must be ordered no later than tomorrow noon.

The Ultimate Principle: By definition, when you are investigating the unknown, you do not know what you will find.

Futility Factor: No experiment is ever a complete failure; it can always serve as a bad example.

Flaple's Law of the Perversity of Inanimate Objects: Any inanimate object, regardless of its composition or configuration, may be expected to perform, at any time, in a totally unexpected manner for reasons that are either entirely obscure or else completely mysterious.

Gummidge's Law: The amount of expertise varies in inverse proportion to the number of statements understood by the general public.

If de-bugging is the process of removing bugs, then programming must be the process of putting them in.

Dykstra.

Spare Parts Corollary: The accessibility, during recovery, of small parts that fall from the work bench, varies directly with the size of the part and inversely with its importance to the completion of the work under way.

Compensation Corollary: The experiment may be considered a success if no more than 50 percent of the observed measurements must be discarded to obtain a correspondence with theory.

Swain's First Law of Organization: One's propensity to be appointed to non-paying positions of responsibility is inversely proportional to the size of one's bladder.

Corrigan's Theorem (or "Jam Side Down"): If there is more than one way in which a system can operate, it will usually operate the wrong way.

Corollary to Corrigan's Theorem: Anything that can fail will.

Second Corollary to Corrigan's Theorem: Anything that fails will fail in the manner most difficult to explain.

Occam's Razor: The simplest explanation of any phenomenon is usually the correct one.

Porteous's Proposition: One million times nothing is still nothing.

A committee is a life form with six or more legs and no brain.

Lazarus Long.

Sod's Law (prevails when Flaple's Law does not hold): In any given set of circumstances, events will combine to provide the maximum amount of incon-

Kyrie Liaison (Oh Lord, Help Us to Keep in Touch): If you can keep your head when all about you are losing theirs, then you just don't understand the problem.

Never eat prunes when you're hungry.

Schmidt's Law

Daniel's Theorm: If you don't know where you're going, then any road will get you there.

Feldstein's Law: Never, ever, play leapfrog with a unicorn!

Schmidt's Law: Never eat prunes when you're hungry.

Rev. Mahaffy's Observation: There's no such thing as a large whisky.

Cannon's Cogent Comment: The leak in the roof is never in the same place as the drip.

The Law of Probable Dispersal: Whatever hits the fan will not be evenly distributed (Also known as the "How come it all landed on me?" Law).

Martha's Maxim: If God had meant for us to travel tourist class, He would have made us narrower.

Russell's Observation: Due to a lack of trained trumpeteters, the end of the world has been delayed indefinitely.

Moer's Truism: The trouble with most jobs is the resemblance to being in a sled dog team. No one gets a change of scenery, except the lead dog.

Vernon's Law: The spaghetti always wins.

Andrew's Deduction: Attila the Hun came from a broken home.

Defalque's Observation: Too many foreign countries seem to be living beyond our means.

Brook's Law: Adding manpower to a late software project makes it later.

Clarke's Third Law: Any sufficiently advanced technology is indistinguishable from magic.

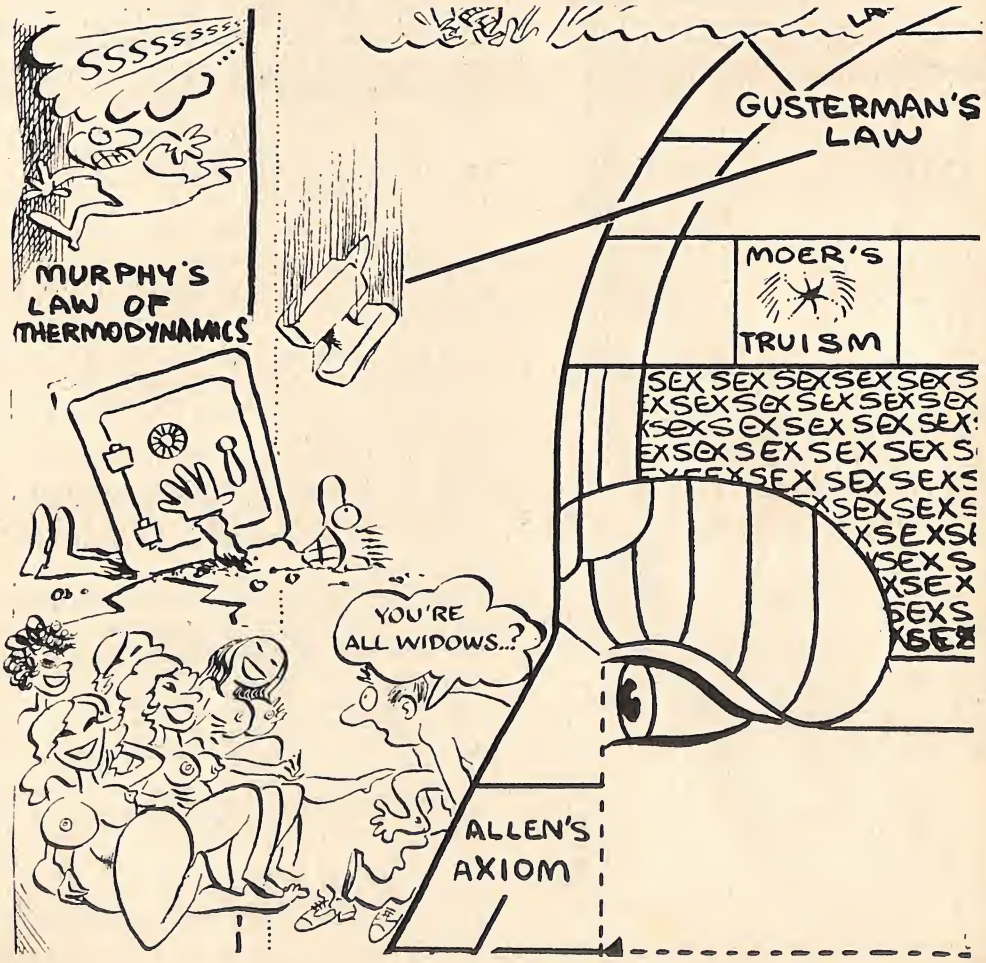
If you don't know where you're going, then any road will get you there.

Daniel's Theorem

Hoare's Law of Large Programs: Inside every large program is a small program struggling to get out.

Laws of Computer Programming:

1. Any given program, when running, is obsolete.



2. Any given program costs more and takes longer.
3. If a program is useful, it will have to be changed.
4. If a Program is useless, it will have to be documented.
5. Any given program will expand to fill all available memory.
6. The value of a program is proportional to the weight of its output.
7. Program complexity grows until it exceeds the capability of the programmers who must maintain it.
8. Make it possible for programmers to write programs in English, and you will find that programmers cannot write English.

This time it will surely run.

Anon.

Weinberg's Law: If builders built buildings the way programmers wrote programs, then the first woodpecker that came along would destroy civilisation.

Quotable Quotes:

A virtual data base is a segment of your imagination

Sigmund Freud.

A flat file is not a list of apartments.

Euclid.

The generation of random numbers is too important to be left to chance.

Robert Coveyou

I strongly recommend the use of chains.

Marquis de Sade.

A lexicon is a small Irish dictionary.

Faith Begora.

On a clear disk you can seek for ever.

SDD Song Center.

Hollerith got us into this hole mess.

US Census Bureau.

This time it will surely run.

Anonymous.

I just found the last bug.

Unanimous.

It is impossible to make anything foolproof because fools are so ingenious.

Edsel Murphy, DEC.

Ellenberg's Theory: One good turn gets most of the blanket.

The Point of No Return Law: The light at the end of the tunnel could turn out to be the headlight of an oncoming train.

The generation of random numbers is too important to be left to chance.

Robert R. Coveyou, Oak Ridge National Laboratory.

It's redundant! It's redundant!

R.E. Dundant.

I don't know any reason why we couldn't do it, but maybe we can think of one.

Mark C. Davison.

Bug? That's not a bug, that's a feature.

T.John Wendel

I write all my critical routines in assembler, and my comedy routines in FORTRAN.

Anonymous.

Always listen to experts. They'll tell you what can't be done, and why, then do it.

Lazarus Long

It is impossible to make anything foolproof because fools are so ingenious.

Edsel Murphy, DEC.

If debugging is the process of removing bugs, then programming must be the process of putting them in.

Dykstra.

MICROCOMP COMMUNICATIONS BREAKTHROUGH!

B.S. MICROCOMP have released a software and hardware package which enables the Commodore 8032 Microcomputer to be used as a remote terminal to other computer systems. The MICROCOMMS Package offers the following features —

* Baud rates from 50 — 4800.
* 24K scrollable screen memory, i.e. view last 24,000 characters received.
* Optional simultaneous printout on a tractor feed normal paper printer.
* Option to save received data on disk or tape.
* Received data can be viewed, printed or saved when data line is disconnected.
* Telecom approved.
* Contact us for further details regarding pricing or special requirements.

COMMODORE MICROCOMPUTERS AND ACCESSORIES

B.S. MICROCOMP are one of Australia's biggest Commodore OEM Dealers. We sell and support the entire Commodore Microcomputer range and are the Australasian distributors for a number of Commodore accessories including Programmers Toolkits, High-Resolution Graphics Boards, DMS Data Management Software and many more. We also have a large range of microcomputer books and magazines including PRINTOUT — the U.K. magazine dedicated to Commodore. For more information, please write, ring or call in.

MICROCOMP
MICROCOMPUTER SYSTEMS DESIGNERS

B.S. MICROCOMP PTY. LTD.
4th Floor,
561 Bourke Street,
Melbourne, 3000.
Tel: (03) 614 1433, 614 1551.

INEXPENSIVE IS NOT CHEAP

They say words are cheap. Word processors are not cheap. Our software for the Apple II is something else.

USING THE NEW TECHNOLOGY

The new technology of microcomputers can save you money without sacrificing quality. There's no longer any need to spend ten or twenty thousand dollars to get word processing in your office. Now you can get an Apple II microcomputer system, team it up with Computer Solutions' Word Processor software – and you will get real power in the organisation of your correspondence.

HOW MUCH WILL IT COST?

Our software has a recommended retail price of $295 – yes $295.00.

The hardware will cost a bit more. Between $4000 and $8000 depending on what kind of printer you require. An Apple II with 48K and a disk drive and a video monitor will cost you about $3000. About another $400 for a plug-in accessory to give you an 80-column display (optional). About $1000 for the cheapest dot-matrix printer, or more than $4000 for the very best letter-quality printer.

The most difficult decision will be which printer to buy. That's your decision.

THE EASIEST DECISION

The easiest decision will be which software to buy. Ours.

Do some comparison shopping. Visit your Apple dealer. We really want you to compare our software with the others. You'll find that ours makes sense to typists. Your secretarial staff won't get headaches.

We'd like to point out that you can save $200 by buying El Cheapo software. But only a computer genius will feel at home with it! It might have features almost as good as ours, but what use is that if your staff can't use it?

NOT QUITE A STANDARD APPLE

When we designed this software we had to work our way around one serious deficiency of the Apple. Its shift-key doesn't behave like the one on an ordinary typewriter. We've designed a little modification. Your Apple dealer can change your Apple for betweeen $10 and $20.

WHAT FEATURES?

1. Human engineering – designed for the user, not just for computer experts. Commands are easy to remember. No "mode" switching. Menus for disk access and Printing. Users can produce quickly, and become proficient in just a few sessions.

2. Full upper and lower case, controlled the way typists expect – the shift key shifts, CTRL shift locks, shift (again) unlocks. Gives audible feedback of lock and unlock. All ASCII characters are available.

3. The same program may be used for 40 column Apples (using HIRES, with on-screen underlining), or with the Smarterm, Videx or Doublevision 80 column boards; also works especially well with the new Vision-80 card from Vista.

4. Fast disk access using standard 3.3 text files; can access text files written by other programs.

5. A GLOSSARY feature! for fast entry of frequently-used phrases or printer control sequences. e.g. CTRL - G S can be defined to enter "Sincerely yours," several blank lines, and your name.

6. Easy formatting to a variety of printers - width, margins, hanging indent, justification, microjustification (with certain letter quality printers), output of any escape or control sequence the printer needs, single or continuous paper, multiple copies.

7. Full mail-merge facilities for form letters, insertion of common entries (e.g. name, address, contract price, etc.)

WHAT'S IT CALLED?

Currently it's sold at ComputerLand stores under the name "WordMaster II" and at other Apple dealers under the name "CS Word Processor". Soon to be renamed "PEN-ultimate".

FINALLY...

If one of your disks becomes damaged (e.g. coffee spills...) return the disk to us with $15 for an immediate replacement.

Every now and again we publish a new version (new commands etc.). You can return a disk for updating for $15.

Replacements and updates available only from Computer Solutions. New purchasers see any authorised Apple dealer.

Computer Solutions

6 Maize Place, Mansfield, Q. 4122

We'll be on the telephone after 10 July (07) 349 9883

WY/B-4

Did You Hear The One About The Travelling Salesman?

Did you hear the one about the bloke who bought a system 'real cheap', only to find out it was being superseded by something better, and even cheaper, the next day? We heard it too; that's why we asked FRED SYMES to do an instant check on the pitfalls of buying and the dangers of salesmen who know too much about salesmanship and not enough about what it is they are selling.

I HEARD the story once that Dick Smith began his electronics business because of the shockingly poor levels of product knowledge retail salesmen displayed when he tried to buy some stereo gear.

The story goes that he was so disgusted with the salesmen's ignorance in a number of stores he decided to set up his own business and give the customer a fair go by employing only those people who could properly advise customers so that they got what they needed.

I haven't bothered to check this out with Dick Smith (he might deny it, forcing me to think of another beginning to this article), but if it isn't true perhaps it should be. . .

The point of it all is the nagging question: how many salesmen in the infant, but burgeoning, microcomputer retail industry really know what they're talking about?

It's a question that concerns, among others, one person I spoke to recently: John Guidice, managing director of The Micro Computer House in Chippendale, Sydney.

While acknowledging there are many topliners out there who are productive salesmen for their employers and give the customer a fair deal, he believes that the industry in too many instances has fallen behind in maintaining a balance between technological knowledge and acceptable selling techniques.

Mr Guidice is afraid that the sharp salesman with little product knowledge (he calls it "blessed ignorance") is putting the microcomputer retail industry in jeopardy of being tagged a rip-off business.

He says that for most first-time buyers — and this category accounts for the majority of sales — the microcomputer is a mystery.

"Your average first-time customer is nervous — the fear of the unknown — and

relies almost totally on the advice of the salesman in making a choice," he suggests.

"If the advice is ill-founded and the customer buys what turns out to be unsuitable for his needs, he will quickly become turned off computers and bad-mouth them from the rooftops".

While agreeing that there had to be a degree of hard sell in what was becoming a very competitive industry, it was essential that the customer's introduction to the product was made in such a way that there was a high degree of immediate and continuing satisfaction.

Mr Guidice says the most important part of a salesman's job in these early days of the boom is to establish as accurately as possible what the real need of the customer is.

This requires a great deal of questioning, for the simple reason that the customer is often only partly aware of what a computer can do.

"It's a bit like the doctor-patient situation. If the doctor does not seek all the symptoms of his patient's complaint, his diagnosis might well be wrong and the consequent treatment useless or even tragic," explains Mr Guidice.

That was why it was so important that salesmen had a high degree of product knowledge and knew enough about systems' analysis to be able to offer sound advice.

He suggested the ideal situation at the point of sale was to have a systems' analyst available to support the sales team.

Again, he used medicine as an analogy. The GP gathered facts and passed them on to the specialist who then recommended the treatment.

This was particularly true in the small business area.

It was not all one-sided, though. He told of many instances of the customer not revealing all the information, thereby misleading the salesman. In that case the customer could only blame himself. Though, of course, he never does.

In an effort to help customers make a realistic decision, Mr Guidice operates a rental system. The potential buyer can hire one of his range of Commodore micros which will most likely suit the purpose and try it out in the office or at home for $25 a week.

"While I'd like to think that people would buy only Commodore, I'm realistic enough to know that certain tasks can best be done by other brands. That's why I'm about to add competitive makes to my rental fleet," he says.

"I'd rather my customers bought a competitor brand from me than buy a Commodore that would dissatisfy him. You see, I'm a bit of a coward and dread the thought of an irate customer coming back to me complaining that I've done him wrong."

For first-time buyers, whether for business, education or recreation, he has this advice:

- Make sure the salesman you approach is not just a salesman, but has sound knowledge of the product.
- Make sure you provide all the information which will help the retailer to provide the right micro.
- Make certain the retailer can give reliable after-sales service and continuing advice.

He also suggests first joining one of the many micro-computer user clubs. The time spent attending a few meetings, talking with users from a wide range of businesses and occupations, would be invaluable in the search for the right product.

In other words, learn enough to be able to do a reasonably accurate evaluation of your needs and of the products most likely to achieve them. □

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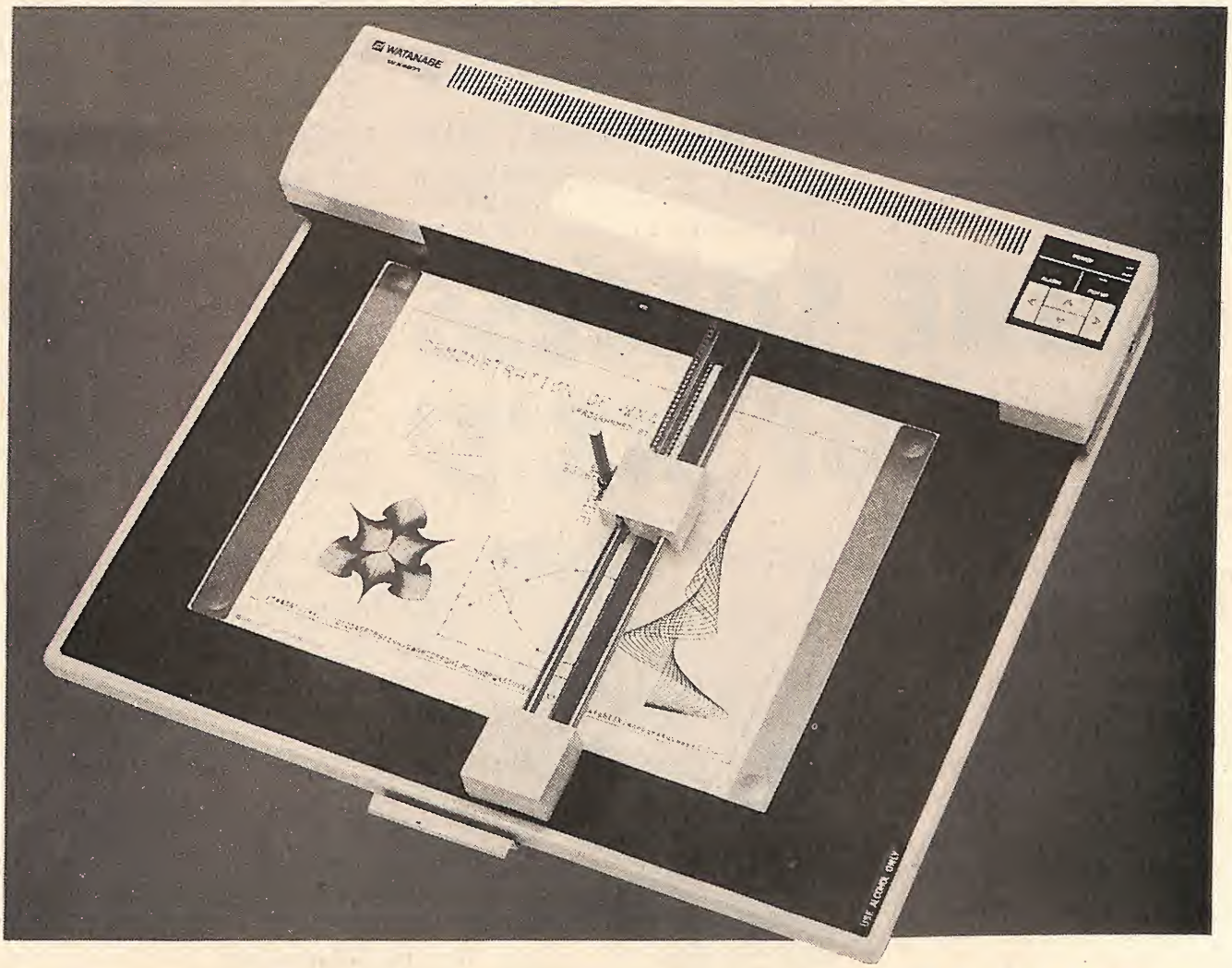

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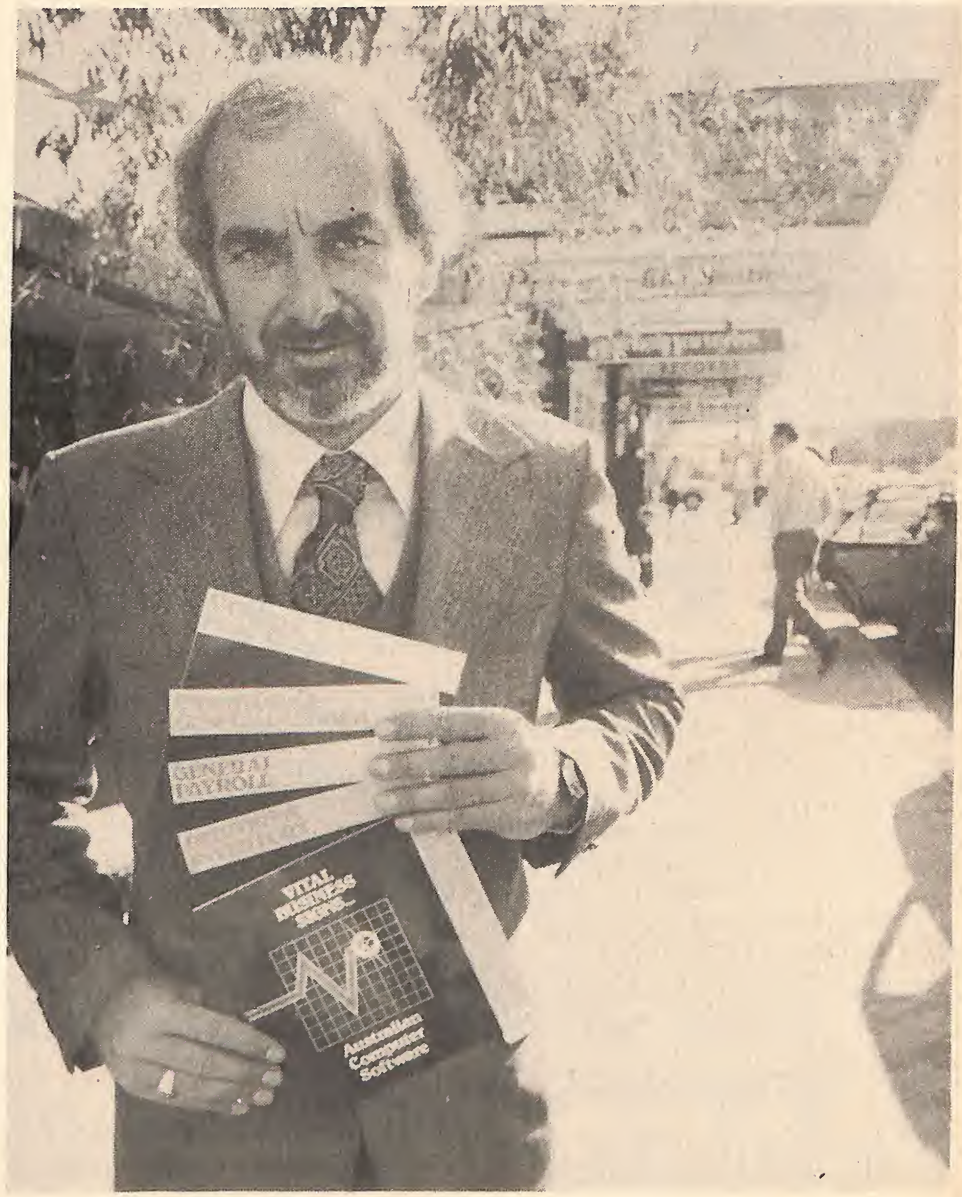
Australian businesses needs are different, so in the first of a series on locally written software, we look at. . .

THE SUCCESS OF SIX 'S'

SIX 'S' Business Advisory Pty Ltd, of Geelong, Victoria, is one of a small but growing number of companies producing software to meet Australian needs. Its creditors and general ledger package is one of many it has released, including a debtors and inventory package, general payroll, and special packages for insurance brokers and medical practitioners.

One thing about the Six 'S' packages is that they are written in UCSD Pascal. The package we examined was running on an Apple, as are most of the packages sold. But the transportability of UCSD Pascal means that the programs could be run under UCSD Pascal operating system or under CP/M, but in theory, at least, the software could be transported to run on a number of other machines including the LSI-11 and TI-990.

The other interesting thing about the choice of Pascal is the implication that this software is supplied as a complete package, with no requirement for modifi-



cation or maintenance. Not too many commercial programmers know Pascal, and this has inhibited the adoption of Pascal as a commercial language. But for writing turnkey packages which will be infrequently modified, Pascal is an excellent choice. Six 'S' has taken a bold step, and I hope it pays off.

What Does It Do?

The creditors' ledger is designed to process all the bills that come into a business from its suppliers, i.e. the creditors. For non-commercial people, here's a quick run-down:

The Six 'S' software allows the businessman to open an account for each creditor. In many larger systems, accounts are numbered, and you refer to each account by number only. The Six 'S' system is much easier to use — each account is named using an abbreviation — and it is possible to search for and retrieve any account in less than a second on an Apple. Accounts with similar names can be stepped through on the screen until the right one is found.

This high degree of interaction with the operator, and the convenience of use, are high points of the software. At all times, the operator is prompted with a short menu of alternative instructions. It is difficult to go wrong.

Once an account is found, it is displayed on the screen. The system maintains a comprehensive record for each account; the full name and address, phone number, name of a contact, information on discounts for prompt payment, last purchase date, last payment date, month-to-date purchases, year-to-date purchases and each current transaction.

Creating new account master records, and adding transactions are extremely easy: the system prompts for inputs at each step, and once the data is entered, it offers the operator the opportunity to alter any of the entries before proceeding.

When a transaction has been entered and checked, the system adds it to the master record and then recomputes the balance on the account. On the Apple, which has a 40-character display, the system can be toggled between two pages, one showing the transaction being entered, and the other showing a summary of the account and the current balance.

The system can provide a variety of reports. There's an aged creditor trial-balance which shows amounts owing over periods up to 90 days. A creditor analysis shows the entire master data file for each creditor. Transaction listings are available in batch sequence or by creditor, or by general ledger account.

A particularly useful report for small businesses is the cash requirements report which shows all the invoices which are due for payment, along with information on any discounts available for prompt payment, as well as any credits which would offset the amount owing. The report shows the total amount of cash required to meet these commitments, but (as Six 'S' points out) does not force their payment. After all, you don't want your computer to be too free with your money!

A remittance advice report shows a summary of transactions and current payments per creditor. Finally, there is a cheque printer routine. All you have to do is sign the cheques!

General Ledger

The general ledger is the financial pulse of any business. It contains all the major accounts and summarises all the transactions going through the business.

CHART OF ACCOUNTS — AS AT 20/ 5/81

1 - ESTABLISH/TRANSFER HOLDING ACC. (CR)

ASSET (DR)
- CURRENT ASSETS
  - 11 - CASH IN HAND / BANK OVERDRAFT
  - 13 - STOCK ON HAND AT PERIOD OPENING

LIABILITY (CR)
- CURRENT LIABILITIES
  - 51 - BANK OVERDRAFT
  - 52 - CREDITORS

EXPENSE (DR)
- TRADING COSTS
  - 91 - PURCHASES BOOKS
  - 92 - FREIGHT INWARDS
  - 93 - SALES TAX
  - 96 - CREDIT CARDS
  - 97 - PURCHASES MISC
  - 98 - COMPUTER
  - 99 - STATIONERY AND WRAPPING
- SELLING EXPENSES
  - 111 - ADVERTISING
  - 114 - SHOP FITTINGS LEASE
  - 115 - MOTOR VEHICLE LEASE

Actual examples of a Six 'S' software package. Real figures, not made up.

PROFIT AND LOSS STATEMENT — AS AT 20/ 5/81

	DEBIT MAY	DEBIT YEAR TO DATE	CREDIT MAY	CREDIT YEAR TO DATE
OPERATING REVENUE				
SALES			18009.73	71662.21
			18009.73	71662.21
LESS TRADING COSTS				
STOCK ON HAND	30000.00	21209.56		
PURCHASES BOOKS	1528.71	24668.25		
FREIGHT INWARDS	0.00	298.83		
CREDIT CARDS	104.81	281.85		
PURCHASES MISC	115.93	305.08		
COMPUTER	8670.68	30310.63		
STATIONERY AND WRAPPING	0.00	243.63		
	40420.13	77317.83		
LESS STOCK ON HAND 20/ 5/81	37000.00	37000.00		
	3420.13	40317.83		
GROSS OPERATING PROFIT			14589.60	31344.38
LESS SELLING EXPENSES				
ADVERTISING	733.02	4055.90		
SHOP FITTINGS LEASE	288.58	865.74		
MOTOR VEHICLE LEASE	0.00	555.00		
MOTOR VEHICLE RUNNING COSTS SALES	469.86	1161.76		
RENT BOOKSHOP AND SHOWROOM	1478.75	4436.25		
WAGES SALES	1494.10	4450.15		
WAGES PROGRAMMING & COMPUTERS	0.00	1944.97		
	4464.31			
LESS ADMINISTRATIVE EXPENSES				
ACCOUNTING FEES	0.00			
LEASE CASH REGISTER AND EQUIPMENT	27.27			
ELECTRICITY AIR COND POWER	0.00			
POSTAGE	66.26			
REPAIRS & MAINTENANCE	83.90			
TELEPHONE	0.00			
TRAVEL	0.00			

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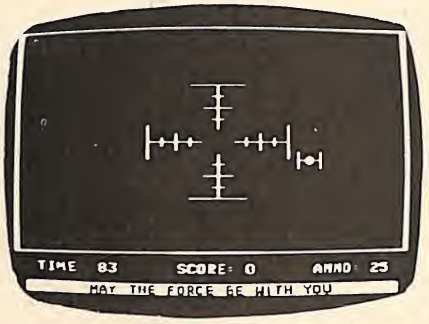

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Entries into the general ledger are automatically posted by the creditors' ledger, and can also be entered manually using a general ledger entry routine.

Like the creditors' ledger, the general ledger accounts can be called up on the screen for review. Each master record contains information on what type it is (asset, liability, expense or revenue), last posting date, month-to-date balance and year-to-date balance.

The general ledger program produces a number of reports. A chart of accounts can be printed, showing all the accounts, with or without balances, grouped according to type. A trial balance shows all the accounts with balances, total per month, current month and year-to-date.

The most important reports are the statement of profit and loss, which shows the company's performance over the year to date and the balance sheet. The Six 'S' software progressively calculates the gross operating profit, the operating profit and the net profit.

The balance sheet shows the current financial situation of the company, particularly calculating working capital, and finally calculating proprietorship plus or minus the year-to-date profit or loss.

Overall

The Six 'S' package is an excellent package for small microcomputers. It is well designed with excellent error checking and prompting, and it is logically laid out and easy to follow. The documentation is very good.

The speed of operation, on an Apple with Disk II, is quite surprising, and can probably be attributed to the use of Pascal rather than BASIC.

Our thanks go to David Diprose of Computer Gallerie, Sydney, for demonstrating the system to us and allowing us 'hands-on' experience. □

GENERAL LEDGER TRIAL BALANCE AS AT 20/ 5/81 6SE12-2 PAGE

ACCOUNT	DEBIT MAY	DEBIT YEAR TO DATE	CREDIT MAY	CREDIT YEAR TO DATE
CASH IN HAND / BANK OVERDRAFT	7576.21	4595.23		
STOCK ON HAND AT PERIOD OPENING	0.00	21209.56		
CREDITORS			5091.51	22515.07
PURCHASES BOOKS	1528.71	24668.25		
FREIGHT INWARDS	0.00	298.83		
CREDIT CARDS	104.81	281.85		
PURCHASES MISC	115.93	305.08		
COMPUTER	8670.68	30310.63		
STATIONERY AND WRAPPING	0.00	243.63		
ADVERTISING	733.02	4055.90		
SHOP FITTINGS LEASE	288.58	865.74		
MOTOR VEHICLE LEASE	0.00	555.00		
MOTOR VEHICLE RUNNING COSTS SALES	469.86	1161.76		
RENT BOOKSHOP AND SHOWROOM	1478.75	4436.25		
WAGES SALES	1494.10	4450.15		
WAGES PROGRAMMING & COMPUTERS	0.00	1944.97		
ACCOUNTING FEES	0.00	650.00		
LEASE CASH REGISTER AND EQUIPMENT	27.27	127.41		
ELECTRICITY AIR COND POWER	0.00	260.80		
POSTAGE	66.26	136.51		
REPAIRS & MAINTENANCE	83.90	83.90		
TELEPHONE	0.00	447.85		
TRAVEL	0.00	56.00		
BANK FEES	20.00	340.50		
INTEREST	242.00	1657.31		
CANBERRA HOUSE PAYMENTS	0.00	876.85		
CANBERRA HOUSE RATES AND UPKEEP	0.00	313.95		
CANBERRA HOUSE INSURANCE 16 CONDA	0.00	39.69		
PERSONAL	201.16	1102.05		
SALES			18009.73	71662.21
CANBERRA HOUSE RENT			0.00	434.34
(ASSUMED OPENING PROPRIETORSHIP:)				10864.03
TOTAL		105475.65		105475.65

As they say in the classics: only the names have been changed to protect the innocent. This trial balance is real and from a small but successful business. It demonstrates the flexibility of the Six 'S' General Ledger.

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COMPUTER THUGS

Captain Zap, Susan Thunder and Roscoe

THEY MIGHT NOT BEAT YOU UP, BUT THEY WILL STEAL YOUR MONEY!

by Christopher Reed

ON THE FBI's "wanted" list in Los Angeles are some of the names of a gang calling themselves the System Hackers. They are known only as Captain Zap, Vladimir, Susan Thunder, Roscoe, and the Sys Cruncher — a strange group of desperadoes who have committed crimes involving more than $1 million.

What is particularly irritating to the FBI and academic experts who have studied the complexities of their methods is that several of the 20-odd gang members are only 15 years old, and almost all are teenagers.

The activities of the gang, and other "phreaks" and "hackers" as they are known, have added a new item to America's crowded police files: juvenile computer criminals.

They inhabit a curious counter-culture world of esoteric jargon and incomprehensible computer "languages", spending thousands of hours hunched over the screens of computer terminals, immersed in calculations that blot out all other activities normally associated with healthy youngsters.

As well as their penchant for pseudonyms, they glory in computer "passwords" such as Prog, Wook, Boppy, Crow, Juice and LLXX.

A self-invented glamor, for they are not happy in their surreptitious work, "these kids are mavericks, loners, introverted types, often from broken homes," says FBI agent Robin Brown, a qualified accountant and graduate of an intensive computer course with IBM.

He has spent six months on the track of the LA System Hackers, without making one arrest. "But please don't call them geniuses," he says, "because they're not. Clever, yes, but geniuses, no."

Mr Brown and others concerned with adolescents and computer crime are anxious to erase what they believe has been media encouragement of the idea of "genius" computer kids. It began, they maintain, with the publicity several years ago given to Captain Crunch, leader of the "phone phreaks". His case is easy to romanticise — but it has cost him three terms in jail.

His real name is John Thomas Draper, now well into his thirties, but a product of

the sixties counter culture. He earned his nickname by discovering that a toy whistle from a box of Captain Crunch breakfast cereal vibrated at exactly 2600 cycles a second, precisely matching the "beep" needed to unlock the vast network of the world's computerised phone network.

He was first caught when he made a free call to Sydney to ask a stranger in a call box the latest hit tunes in Australia. For that he got five years probation, and became a folk hero of the "phreak" set.

The crunch came for the captain when he used his computer to break into AUTOVON. (Automatic-Voice Network), the military's secret phone system. He was caught and went to prison.

Gone perhaps, but not forgotten, for the latest example of Crunch-style computer capers has taken place at Palo Alto high school in Silicon Valley — a school Crunch attended.

Two pupils, one 16 and the other 17, used their access to the school district's Hewlett Packard 3000 computer to probe its secrets. It is used to store confidential information, including assessments of teachers and gradings of students. It can be used by students who outgrow the district's HW 2000, a less complex model used only for educational purposes.

The high school hackers committed what amounts to electronic burglary by "breaking in" to the system. After cracking the 3000's store of information, they could have wiped out records, changed reports, or given themselves higher grades. "They could even have altered the principal's salary," said Mr Richard Carey, the district's director of research, testing and computer services.

It is significant that the two pupils owned up; they were not caught.

It is also astonishing to some societies that students at high schools like Palo Alto receive computer lessons as part of the usual curriculum from the age of 11. The town may be unique — 85 per cent of the parents have university degrees and many work in computer research and technology.

"These kids go home to their own computer terminal in their bedrooms in many cases," says Mr Carey. "They shut themselves in and spend all evening on it. These are the hackers and the parents don't mind. I suppose they're glad the kids aren't playing rock music. Computers are at least quiet."

Some people like Stanford Research International's Donn Parker, senior information system management consultant and tutor to the FBI on computer crime, are beginning to worry about the wisdom of teaching youngsters about computers.

But with the increase of home computers — half a million TRS-80s and Apple IIs have now been sold for domestic use — people like Mr Parker can only expect to keep one step ahead in the never-ending security battle in the computerised society.

And "battle" is no exaggeration — both Mr Parker and the FBI's Mr Brown used the word "enemy" when talking of the computer "phreaks".

While computer crime in the adult world costs industry and Government millions each year in electronic embezzlements, juveniles seem largely satisfied with vandalism.

The LA System Hackers, for example, have broken into Digital Equipment Corporation (DEC) systems used nationwide, mainly by businesses. They may have made some money with the theft of copyrighted data, which can fetch good prices for the work they represent, but in Mr Brown's opinion the gang has done little for profit. "They have caused hundreds of thousands of dollars worth of lost business purely by being destructive." he says.

In one case, the gang got into a DEC system which stored the entire genealogical records of millions of pedigree dogs and horses. "They just wiped the whole thing out. Years of records gone, pffft," said Mr Brown.

The young computer groupies of Pala Alto, Los Angeles and elsewhere are also going largely unrestrained through the reluctance of district attorneys to prosecute 13-year-olds for system hacking — and then lose the case. "We are now investigating the Palo Alto case," said Mr Parker. "but generally the DAs just don't want to know."

The hacker is an enigmatic fellow, too, and not what one would expect from the normal adolescent.

He cares little for his appearance, tending towards long straggly hair sometimes bound in a pony tail for convenience, a wispy beard, not because he has grown it, but because he hasnt bothered to shave, jeans, sneakers, and wool plaid shirts.

He tends to be pale from being indoors all the time, and wears thick spectacles, having strained his eyes from watching small green luminous letters on a screen since the age of 11.

He is not a healthy lad. He regards exercise, games and the eating of meals as unwarranted intrusions on system hacking. He wolfs junk food at odd hours, preferring Yummy Yuk Bars and Koolfiz because these are easy to eat while sitting at the terminal.

He is not interested in rock music, preferring to use his radio to tune into police wave bands because it is technical and illegal. The messages, of course, do not interest him.

Conversation is spattered with "buzz words," the curiously ugly jargon of computer language, in which "input" is received in order to "interact" better at "access time".

"I'm afraid," sighs Ms Nancy Palmer, for 12 years a co-ordinator of computer education in Silicon Valley, "that some kids think of nothing else but computers. they become obsessed because the computer becomes a substitute person. There it is with its 'brain' but it is non-judgmental.

"These boys are very knowledgeable but it's not horizontal; it's vertical. I try to limit the time the worst hackers spend with the computer, but they go home and spend all evening in their bedrooms with their own. Their parents have bought one. You can get one for $3500 with disc drive so you can store your stuff."

These strange creatures, then, are the first computer generation. Some, as they grow older, will apply their knowledge in a criminal way.

Stanford's Mr Parker said: "A new safeguard against computer crime is a new challenge for these people. I'm investigating 800 cases at present, and that's just a small collection. We don't know how much computer crime there is; it's an empirical war that waxes and wanes."

The computer crime of the future should be spectacular. Mr Parker forecasts that within a few years a major computer crime will result in the total failure of a large corporation or a major Government department. □

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CASE HISTORY

Ken Nielsen had a gold-plated, jewel-encrusted reason to want a microcomputer. FRED SYMES reports that once the teething headaches were over the business ran as though it'd been using a computer for years. . .

KEEPING TRACK OF A FORTUNE!

KEN NIELSEN works in the exotic world of gold, silver, diamonds and other precious stones. Heady stuff. But not without its headaches. That was, at least, until he got himself an Ohio Scientific microcomputer about a year ago.

Now Mr Nielsen successfully runs his Sydney manufacturing jewellery business, Taran Trading Pty Ltd, and wonders how he ever managed without his micro.

He began thinking about computers 18 months ago when wildly fluctuating prices for gold and silver and accelerating values for precious stones presented him with the almost impossible task of maintaining an accurate log of stock value.

In his pre-computer days a revaluation of stock in hand could take up to a month, which created doubts about true profitability levels. Now he can do it in a couple of hours.

The importance of this instant valuation is that only by trading at current market values can a jeweller protect his assets — stock in hand and raw materials.

Ken Nielsen is the first to admit that he knew nothing about computers when he began looking for equipment.

"I didn't even know about micros," he says.

"During my search I met a lot of tall guys with beards and boots and a flow of jargon that I couldn't make sense of. Eventually I heard about microcomputers and their price advantages and got alongside Frank Barrett at TCG in Crows Nest. I was on my way."

Then he struck his first problem. He couldn't find a software package that suited his needs.

"A progammer came in to sort things out, but we were getting nowhere fast because he really didn't understand the peculiarities and complexities of my business, though I must say we developed a good friendship," Mr Neilsen says.

"At that stage I decided I'd done the wrong thing and cursed myself for having $25,000 worth of hardware sitting idle in my office."

It was then he decided he'd better try to sort things out for himself. Sixteen years earlier he had done a very simple program at tech. The blurred memory of that wasn't much help other than to satisfy himself

Mr Ken Nielsen at work in his exotic world of diamonds, gold and computers.

that if he could do it once he could do it again.

With manuals and programming guides he set to and found that so long as he followed a logical train of thought, he could get the computer to do things for him.

There were times when he felt like tossing in the towel but he stuck at it and in three months he had his program up and running. Since then he has developed and extended it to the extent that Frank Barrett reckons Mr Nielsen has software worth about $80,000. So efficient is it that in association with Mr Nielsen, TCG is preparing a package to be made available to other jewellers and businesses with similar needs.

For Ken Nielsen, costing a jewellery item is not a simple matter of adding material and labour costs then putting on a markup.

For any one item there are up to 15 cost factors. As well, he has a range of five discounts and 20 markups for buyers relevant to the size and continuity of orders. Then there are the complexities of sales tax which varies between ranges of goods.

By programming all the set cost factors plus the variables, Mr Nielsen can produce an accurate price list for individual wholesalers or retailers virtually on the spot. Previously, it took the best part of a month to produce a price list, by which time it could be out of date by several points.

Another area where the computer has proved invaluable is with sales reps. Mr Nielsen's reps carry up to $100,000 worth of samples which might number many hundreds. The information from the reps' orders are fed into the computer, which picks up any errors in arithmetic and updates the cost as at the date of order. The computer also subtracts any items sold from reps' stock.

"Stock control at this level was a real headache before I got my Ohio — and my software — and it was just about impossible to know where I was at so far as the stock carried by reps was concerned", Mr Nielsen says.

His software does all his accounting, allowing him to get statements out on the first of the month rather than about the 15th as in the past.

So successful has Ken Nielsen been with his own software that he has been offered jobs as a programmer, "but I much prefer the world of gold and diamonds," he says.

He says that in these days of inexpensive micro hardware he could not understand how small businesses could work efficiently without them.

He did warn, though, that it was an unwise businessman who went shopping for hardware and then tried to fit software to it. It was essential that the software package came first. Once that problem was solved the choice of hardware was a simple matter. □

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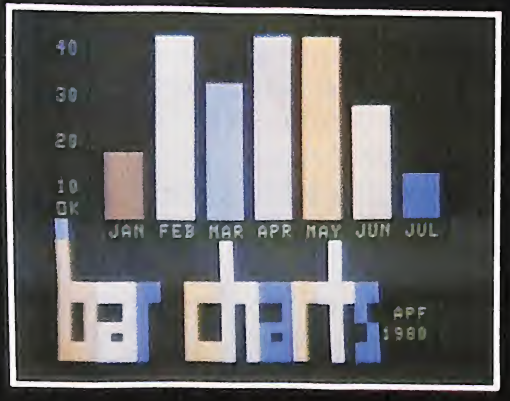

"YOUR LIFE will never be the same"; that's APF's promotional promise with the Imagination Machine, and it could prove prophetically accurate for at least one *Your Computer* reader.

It will be the case if the reader who wins APF's unique home computer is a newcomer to the incredible world of computing.

The Imagination Machine has a lot to offer for everyone: by virtue of its clever concept and design, it's almost the ideal home computer for the man in the street, yet it also offers the features and capabilities he'll want and need when he becomes an enthusiast.

The "uninitiated" can, if they prefer, treat the APF unit as an uncomplicated push-button machine. Simply plug in a program cartridge and go, without any loading, programming or debugging hassles. They need know nothing more than how to read English and how to operate a power switch.

The more expert the user, the more the machine can do; including playing music, running normal or high-resolution colour graphics, plotting shapes and charts, and developing complex games or educational programs.

The basic machine can be expanded relatively cheaply to add on twin disk drives and a printer.

Your prize is actually worth a total of $1265; it includes almost $200 worth of ready-to-run software in the form of APF plug-in memory cartridges and prepared program cassettes.

A major feature is the inclusion of APF's excellent Basic Tutor package, worth around $75 — even the beginner can be programming for himself in no time.

Your Computer makes no apologies for being biased toward the beginner. Our first issue was just the beginning of the help we are going to give to computer newcomers. But we haven't forgotten or ignored the enthusiast. Or the teacher. Or the engineer.

The competition is open to all, and AVAILABLE to all. Whether you know more than the IBM brain trust, or have never heard of a microprocessor, you can win the Imagination Machine. Either way, you should learn from it as well as enjoy it.

Good luck! □

Want to Know More?

IF YOU want to know more about the prize in Your Computer's *great inaugural competition, call in on one of the competition co-sponsors:*

If you would like to see one in action, call in on one of the co-sponsors — dealers who have joined with us to establish the competition:

- **Calculator Supermarket,** *435 Bourke Street, Melbourne. Ph. (03) 67 6412.*
- **Radio Parts Group,** *562 Spencer Street, West Melbourne. Ph (03) 329 7888.*
- **Kalextronics,** *101 Burgundy Street, Heidelberg. Ph (03) 458 2976. Shop 11, Melton Shopping Centre, Ph (03) 743 1011.*

Of course, if it means catching a plane to get there, forget it — try one of the interstate dealers listed by the importer on page 62 instead.

The Rules

1. The official entry forms will be published in the May and July issues of *Your Computer.*

2: There is no limit on the number of entries by each person, and several entries may be delivered in the same envelope, but all entries must be made on the official coupon (plus attachments where necessary). Photocopies or other facsimiles of the entry coupon will not be accepted.

3: Employees (and their families) of White House Publishing Group, Calculator Supermarket, Radio Parts Group, and Kalextronics (plus any company, group or individuals associated with the printing, distribution or sale of this magazine or with the running of the competition) are not eligible to enter.

4: The closing date of entries is 5pm on July 31, 1981. Mailed entries received within five days of this date, but date stamped on or before the closing date by Australia Post will be accepted.

5: The winner will be notified by telegram, and the result will be published in the September issue of *Your Computer.*

6: The winner will be determined after examination of all answers to question 1 on the entry coupon. Question 2 answers will be considered in the event of a tie, as will the date of receipt of entries.

7: *Your Computer*'s decision will be final, and no correspondence will be entered into.

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2: Answer the following question in 50 words or less:
"What do you want to do with a home computer?"
(If you've picked up *Your Computer* because you're a beginner trying to unravel the mysteries of computing, this issue should have already given you hundreds of ideas. Simply discuss your favourite):

.....

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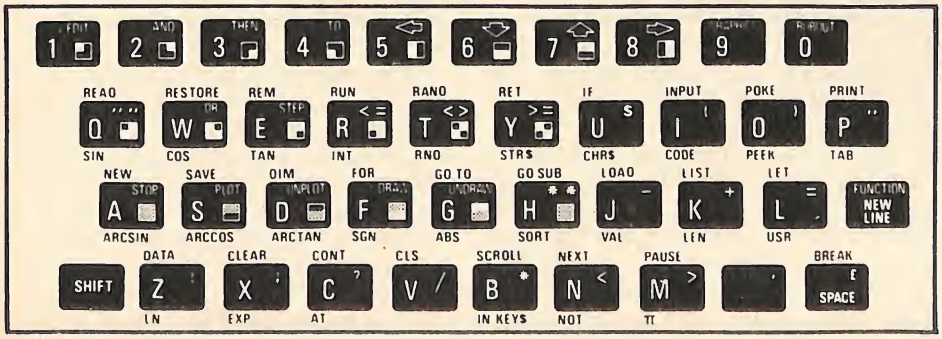
Fewer chips, compact design, volume production means MORE POWER FOR YOUR DOLLAR! The ZX80 owes its low price to its remarkable design; the whole system is packed onto fewer, newer more powerful and advanced LSI chips. A single SUPER ROM, for instance, contains the BASIC interpreter, the character set, operating system and monitor. And the ZX80's 1K byte RAM is roughly equivalent to 4K bytes in a conventional computer because the ZX80's brilliant design packs the RAM so much more tightly. (Key words occupy just a single byte). You can add to the memory via the expansion port, giving a maximum potential of 16K.

ZX80 8K BASIC ROM



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APC5

ANYTHING YOU CAN DO IT CAN DO BETTER

Continued from page 32

Olivetti

Peter Hall, a systems specialist with Olivetti Australia, says the company is moving in the direction of selling word processors as "stand-alones that can cluster"; an unusual way of saying the buyer of an Olivetti can add on to the system when and if the need arises.

Olivetti's main contender in the market is its TES 621, a $13,000 stand-alone system with a 1920-character screen, dual-drive, density floppy disks, all hooked to a daisy-wheel printer.

Like its competitors, the TES 621 has an enormous range of editing abilities, such as automatic margin shifting, easy movement of words, paragraphs, phrases or columns of words to different parts of the page of text being processed, automatic delete of words, phrases, sentences and so on, word underlining and much more.

The system is also capable of carrying out complicated arithmetic, and also has the ability to do page layouts on the screen, which will come out as displayed on the printer.

Both disks are on-line and can store about 600 pages of text (1 million characters) for later use.

According to Mr Hall, many users could begin introducing a word processor to the office by way of an intelligent typewriter, and build up from there.

"Our argument with the electronic typewriter is that at this point in time, say you're not ready for a full management-based system?

"What do you do in a few years' time? Throw the typewriter away?"

Olympia

Says Peter Hudson, of Olympia (Australia) Pty Ltd: "We sell in the gap between the typewriter and the top word processors."

With prices ranging from about $1700 to $3000, Olympia's memory typewriters, including one system with a 20-character video screen are mainly for people who have text processing problems — businesses that prepare contracted work which uses common clauses and requires repetitive typing.

The typewriters can also be used as serial printers.

The benefits of a memory typewriter, used in conjunction with disk storage, include high-volume text which needs to be stored for long periods. Applications in this category include reports, legal documents, contracts and manuals.

There are quite a few Olympia memory typewriter systems, with all of them offering reasonable degrees of editing ability and, when used with disk drives, unlimited storage.

Typrinter 221

The Typrinter is an intelligent printer that is completely compatible with every computer and all word processing software, says Richard O' Connor of Australian distributor Impact Computers.

For about $3000 this intelligent printer offers an amazing array of features. Five microprocessors in its logic can record often-used phrases and formats, do right hand page justification automatically, space proportionally and run various pitch type.

It also has many of a word processor's functions built into it, and can do half-line spacing, important for equations and the like.

Its greatest ability is it can be run on any microcomputer, like the System 80 or NCR, which turns that computer into a full-blown word processor.

The printer has built-in a text-editing capability, but is compatible with any word processing software already being used.

It can be a printer and a terminal, and can talk to its host computer. It can also run punch tape for a Telex, indeed is capable of operating as a Telex (this is subject to Telecom approval).

The Typrinter 221 is also extremely quiet, acording to Mr O'Connor, and needs no soundproofing.

Impact Computers supply the interfaces where the printer does not have one already built in.

IBM

The Displaywriter is, says a company PR officer, Ms Maureen Young, IBM's "leading edge" in word processor technology. Priced from about $9500 for a single unit up to $26,000 for three work-stations, she says the Displaywriter includes "very advanced features, including a self-checking spelling corrector in several languages."

Under the general heading of Office System 6, the Displaywriter and its more expensive stablemates have available text processing with distribution functions that allow mass mailing to be handled externally and internally.

Further up the scale, in price and size, are systems for medium-sized businesses. The IBM 5220 handles word processing, document distribution and file handling (among many other features, of course).

The word processing features include allowing the operator to create, revise, share, print and store documents.

Mailing lists are easily updated, and can be merged with text in, say, sending out the same letter to a lot of different people.

In concert with other word processing systems, the IBM range can be built up to a huge word and data processing network, or can exist quite happily as a stand-alone.

Raytheon

Raytheon's main iron in the fire is the VT1303, a dual-disk drive, half-page display system, complete with all the usual editing and formatting features.

Ms Janet Hole, of Australian distributors Raytheon Office Information Services, explained that there was quite a list of options with the VT1303. These include a BASIC interpreter, plus many software packages.

Price for the VT1303 is about $11,500, plus tax.

A communications package is offered, and up to three terminals can share the word processing system.

Vydec

Another manufacturer which offers a wide variety of word processors is Vydec, a subsidiary of the world's biggest multinational, Exxon.

The word processing product manager for Datronics Corporation Limited, Australian distributor of Vydec, Ms Beth Barclay, explained that there were two main models on the market — the Vydec 1800 and the 1400.

The 1400 is described by Vydec as a "text-editing typewriter with flexible magnetic disk storage and an independent printer." It also includes a TV monitor.

It has many of the text editing features of its competitors, including automatic line justification. The operator can prepare, edit, revise and format such things as legal documents, presentations, form letters, mailing lists and so on.

The 1800 can be used as a records' processor, full word processor and includes full page display, dual disk drives and uses a daisywheel printer.

The 1800 is also compatible with other Vydec systems and has many communication options.

Qyx

Another intelligent typewriter, the Qyx has five levels of intelligence.

Also from the Exxon stable, the Qyx can be used as a printer with Vydec systems, or used as a word procssor in its own right.

Qyx level 1 has features that include a phrase dictionary, automatic centreing, decimal tab, automatic erase and so on, while the level 5 is a dual-disk, text editing system which can be used to store, revise or type documents which need joining from several sources of information.

The higher level Qyx intelligent typewriters have many features of larger and more powerful word processors. □

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High technology, computers and our own version of the Chinese Great Leap Forward have split society into two camps — that of people whose jobs will survive and that of those people whose jobs won't.

Not yet under direct threat are our children, but unless we do something immediately they are risking leaving school and applying for jobs which don't exist. It's because educators and governments will have failed to make them 'computer literate'.

Teacher unions in Australia are well aware that while some children are being taught to survive in the new computer society, most are being given what is at best an ad hoc education in the new technology.

MARK CAMM canvassed the unions and in this story presents his view of computers and the education system. He insists that only one person can win the conflict. That person must be your child.

THE VERSUS SYNDROME

IF YOU thought education was in trouble, there's an even greater shock waiting for you around the corner — educators and governments cannot agree (and certainly have no clear idea) on how to make our children 'computer literate'.

In the jargon of those educators who can think forward to when today's children are tomorrow's unemployed, computer literacy is a term meant to be all things to all people. It covers everything from taking the awe and magic away from computers to explaining in detail the technical and mathematical make-up of complicated technology.

State education departments have hardly, if at all, kept themselves awake at night worrying over educating our children about computers. Politicians, for all their waffling, look at the matter in one light only: cost — and if it costs too much, you can't have it. Big business has to be subsidised to keep capital and employment in Australia, or we'd all go broke. There's a lot more to be done than supply schools with fancy computers, our leaders have decided.

You, too, must share the blame for not educating fully our children in one of the most radical and complete changes to society any one generation has had to face.

Computers are not something new to be added on to what we have already; they're replacing what we have (not taking it away), and our children have to be taught what their new role is to be.

Most teacher unions are painfully aware of the effects technology is producing in education. Twenty years' ago a primary-school pupil would have thought all his Christmases had come at once if the school had a film afternoon. Today, a primary-school pupil may not have too many bountiful Christmases to look forward to if a start is not made in making him familiar and comfortable with computers.

Mr Barry Jones, ex BP Pick-a-Box quiz champion and lately Federal Opposition spokesman on technology, is in no doubt about the effects of technology on society: it's so profound, he says, as to be almost ridiculous.

In America, for example, fast food outlets like McDonalds employ more people than the steel industry. There's an incredible increase in the number of hairdressers, and it's because of technology that steel workers are deserting the mills to become hamburger fryers and hairdressers; automation is taking their place and people are being forced to find less traditional jobs.

This is the problem our children will have to face, and if they're to do it with any degree of success, you will have to face it with them.

And the place you face it first is in the classroom.

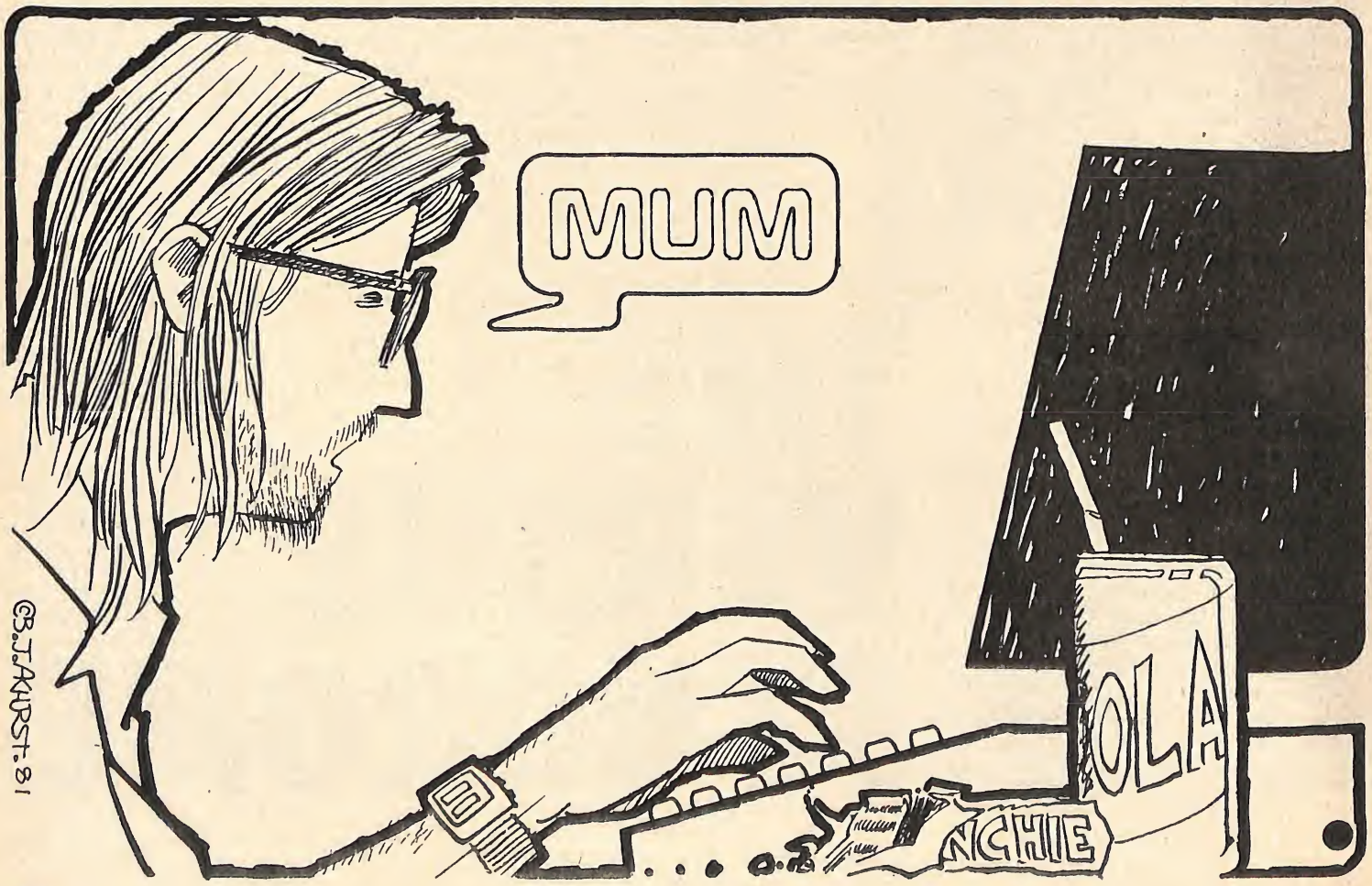
Parental ambitions being what they are, you may have wanted your child to be a good shorthand-typist or perhaps a brilliant engineer. You had better think again, because the traditional shorthand-typists and engineers are working animals inevitably heading to an evolutionary death.

Some people panic at this thought; Alvin Toffler's 'Future Shock' theory (that if too many changes happen too quickly, people fall apart and stop thinking rationally) is becoming all too true.

Technology *versus* jobs *versus* wealth *versus* traditional values is having a quite shattering effect on people whose jobs are currently under threat from the microchip; there's no reason, and no point, in making our children suffer as well. The simple and expensive answer is to give them an education which will equip them for a future which will be as alien to us as television and space travel would have been to our grandparents.

Only one State is doing something about ensuring computers are brought into the classroom in a structured and sensible way. Surprisingly, it's not NSW — and there again, perhaps that's not so much of a surprise — but Tasmania which is leading the country in computer education

The Tasmanian Teachers Federation information officer, Mr Vince Nolan, shocked me at first when he said: "We as



an organisation have no specific policy on computer education." But it's understandable when you realise the Tasmanian Education Department has already attacked the subject in a fairly responsible way.

Every high school in Tasmania has a computer. Most primary and area schools have a computer, or access to one. And the equipment is not just for show, there are teachers who know computers, and have themselves been taught how to teach computer courses.

The Lucky Few

If Tasmania is a trend-setter in *computer* education, its tertiary institutions are trend-setters in *teacher* education. You can study for a diploma in education, majoring in computers; there are other teaching courses which allow teachers to gain extra qualifications in computers.

The Elizabeth Matriculation College in Hobart was the first secondary school in Australia to offer students computer studies.

The man responsible for this leadership, officer in charge of the Elizabeth Computer Centre, Mr Scott Brownell, says that "computer awareness" should be happening now, not some time next week.

He explains that as society moves further into the age of computers and high technology, "the need for computer awareness should decrease as computers become more widespread."

In other words, if we don't immediately help our children understand computers, then events and progress will overtake them and make them just as vulnerable and worried about technology as we, the pre-computer generation, are vulnerable and worried.

There are the lucky few (the lucky many in Tasmania) who are being given a good education in computers; they are the privileged of the future. Is it fair they are to be the only ones?

The secretary of the Australian Capital Territory Teachers Federation, Mr Ian Alder, says that computer courses in the territory are "alive and very well."

But, he says, it's mainly Year 11 and 12 pupils who benefit.

The point needs making again: *all* pupils need to benefit.

However, Mr Alder says the ACTTF is realistic: "We live in the real world, and computers are part of the world."

He agreed that more than just teaching how to operate a computer or undersand its functions was needed; the social impact of technology was equally worthy of study.

The other side, of 'smashing the looms' as it were, needed to be defeated.

Teachers in the Northern Territory face a far greater threat than those teachers in the more urbanised, richer States.

They'd like a future. No computer literacy, no future.

According to the president of the Northern Territory Teachers Federation, Mr Warren Bury, some bureaucrats see computers and technology as a good way to cut down on the number of teachers — a proposal he, and spokesmen for all the teacher unions, vehemently opposed, as should anyone with even a touch of reasoning power. In an area as vast and underpopulated as the NT, it must be a bureaucrats dream to replace teachers with video screens and computers at the more remote schools.

Mr Bury agrees there is "possibly not enough done on the values and effects of computers on society" in the courses currently run. This is probably due to computer courses coming under the wing of maths teachers.

He says that while computer courses in the territory are reasonably healthy, "Up here it depends on variables."

The fate of computer programs usually depends on the enthusiasm of a particular teacher in a school.

"If there's not a person in the professional services area, it drastically reduces the success of the course in a school," Mr Bury says.

Rather than an ad hoc system, the curriculum needed to be changed to give the courses a fighting chance of survival. But more importantly, qualified people were needed in the schools to teach the subject consistently and adequately.

Should a computer course of some description become one of the basic subjects, like English or mathematics?

"I wouldn't be prepared to go that far, but I would say it would be a good idea," Mr Bury says.

"Ideally, you need everybody, as large a group of people as possible, who are able to advise others on how computers can be used — as labour and time-saving devices, for example.

"You also need people who are aware of some of the pitfalls.

"Computers can't get rid of teachers, but it's not going to stop some people from trying.

"Two groups of people worry us: the administrators who would like to see this happen, and politicians who insist it does as a cost saving.

"The other group is within our own ranks. The pessimists."

The vice president of the Queensland Teachers Union, Mr Robert Fifoot, wrote a paper for the union on the impact of technology. He is currently trying to put together a "policy document".

He sees another side to the question of computers in schools:

"I've observed in schools a tendency for some students who don't relate well to other kids 'talking' to a computer, which isolates them even further.

"Teachers need to be aware of this."

Mr Fifoot describes the health of computer courses in Queensland as "not as advanced as in other States."

Again, the courses are mainly for secondary school pupils, and again, there is a shortage of equipment and qualified teachers.

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"There hasn't been very much impact yet on education. The cost of equipment is high and many schools haven't been able to rake together the money to buy anything but small micros," Mr Fifoot says.

He says, with great tact and diplomacy, that "the Department of Education is in a tight financial position, which does not help."

The Knowledge Explosion

Everyone emphasised the 'knowledge explosion' and the need for the "kids to know, if they're going to survive."

The president of the Western Australian Teachers Federation, Mr John Negus, says that WA's computer courses are getting better.

But he admits it's the old bugbear — everyone's 'supportive', but a lot of that support is 'ad hoc'.

"Over here the education department is on the ball," he says. "Most high schools have had good contact with computers, and headmasters have been able to use the education department computer for yearly timetabling.

"The computer courses have given people another direction, made education more exciting."

The WATF, Mr Negus says, constantly reviews its policies on technology and computer education.

"I just happen to be close to the scene because my wife teaches at a primary school where computers have just been introduced," he says.

The Australian Teachers Federation, a monolith of committees, reports, and a constant reminder to education departments and governments that all is not well in education, expresses considerable concern over the lack of central planning for the funding and teaching of computer studies.

Although its annual conference in Sydney in January concentrated on the subject of government funding for private and public schools, there were many reports presented which reflected the growing concern of teachers over just what it is we are teaching our children.

According to Mr David Widdup, the ATF's research officer, there simply isn't enough "in-service re-training" for teachers already involved (qualified or not) in computer courses.

He echoes the opinion that most of the effort put into computer studies is 'ad hoc'.

"My view is that teaching kids about computers is an important area, otherwise it becomes a mystique," Mr Widdup says.

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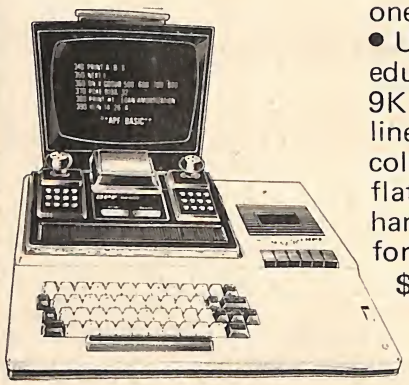

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"But we wouldn't advocate teaching kids direct job skills."

Because many of the jobs women have traditionally taken are being made redundant by computers, he advocates that girls are given far more encouragement to take on computer studies. And not just so they can take the lower level of jobs offered, but move directly into management, systems analysis and programming.

"It's a good area to crack down on sexist stereotypes," Mr Widdup says.

He says the ATF would strongly oppose any moves to have cuts in staff numbers at schools justified solely on the grounds of computers being introduced.

The human relationship between teacher and student was still a cornerstone of education, but computers were an invaluable teaching aid as well as an education in themselves.

Your Opinion

Education in Australia is in the midst of a dangerous conflict.

The Federal Government is determined to cut down on the amount of money given to the States, and is even considering abolishing the Department of Education.

The States, with more to do and less Federal money to rely on, are caught in a trap of satisfying electoral demands for better roads, better health care and better education.

To most people better education is little more than good-looking schools, polite children and a solid grounding in the 3Rs.

It takes imagination and courage for a State Government to recognise the importance of computers to a child's education. At the moment, it's not electorally popular because society itself is fighting a war of its own on technology versus jobs. What government in its right (being elected next time) mind is going to turn around and spend a lot of time, money and effort on bringing computers a lot closer to children?

The subject is an emotionally charged one, the fact that it's far more complicated and involved that one article can show doesn't help provide solutions and sensible debate.

Do you have a child at school? What do you think of the effect computers are going to have on his or her future? Do you agree that a lot more needs to be told to our children about the working life they will sooner or later have to enter?

It's easy to sit back and say that this or that is wrong and something should be done.

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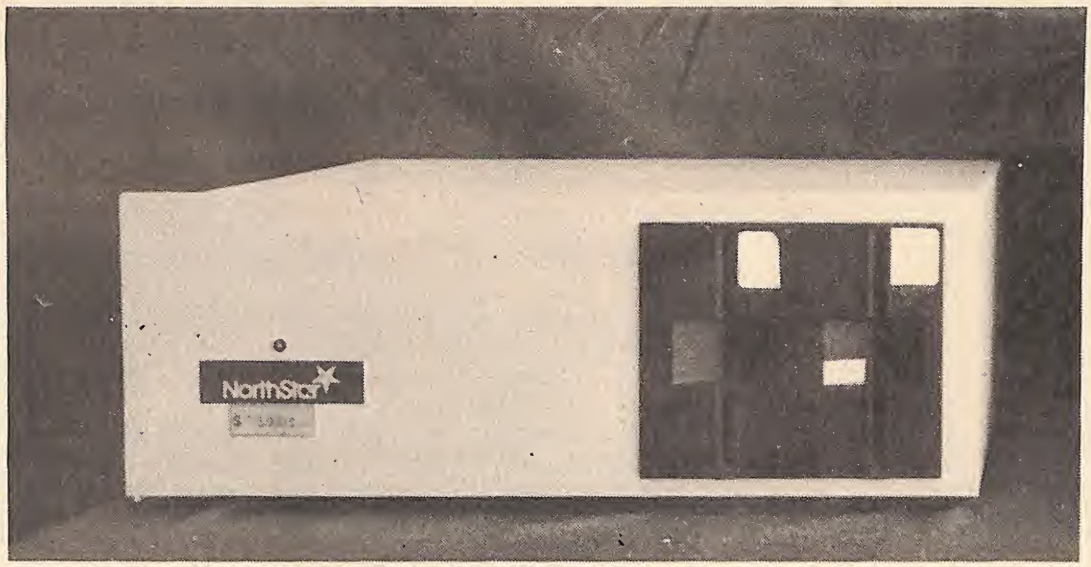


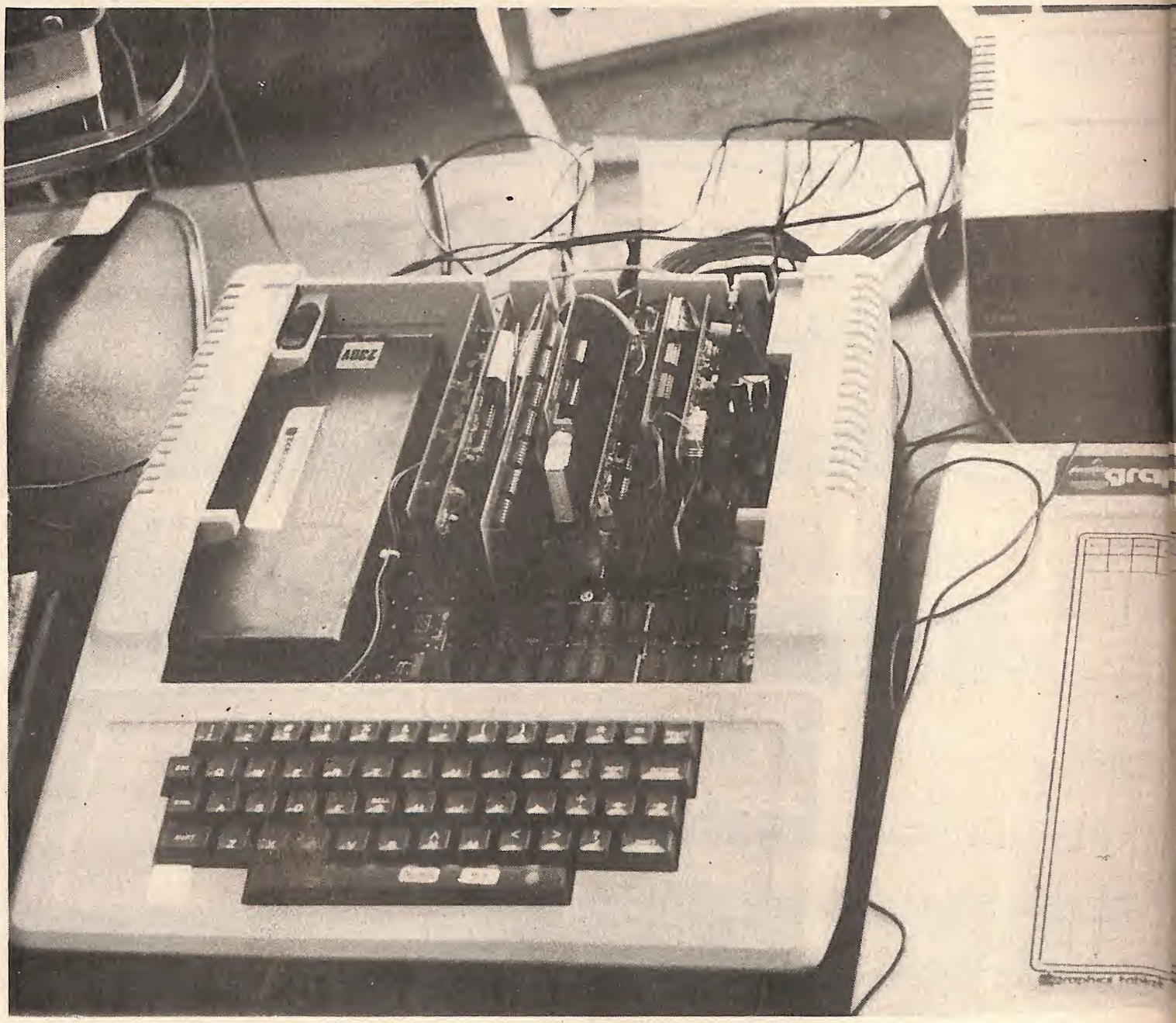
HIDDEN BEHIND THE SCENES Is An Operating System Called... CP/M

Most computer freaks have heard of CP/M, even if they don't actually run it. It's even available for the Apple, and is the most popular operating system for the TRS-80 Model II. Here Les Bell fills in the background for first-time users:

IN 1976, vague rumours started to circulate about a new piece of software: a floppy disk operating system which enabled the microcomputer owner to use floppy disks to store data and programs for fast access. The rumours turned out to be true, and Gary Kildall's Control Program for Microprocessors (CP/M) was released soon after. In fact, it had been released to OEMs for some time and was reasonably well debugged.

CP/M is now the most popular operating system in the world, with far more installations than any other. What is it? To understand that, we'd better start with the basics of floppy disk operations (talking about eight-inch, single-sided, single density disks initially, to keep it simple!).

A floppy disk stores information in 77 concentric tracks, each of which contains data plus extra information to identify the sector, track and so on. The trouble is, you can't treat a floppy disk the way you would a cassette tape; you can't just position the read/write head over a particular section of the disk and say, "okay, computer, write that text file here". For a start, the disk is rotating at 360 rpm, and secondly, you



don't know what may have been recorded on that spot previously.

This is the beauty of Disk Operating Systems. A DOS program will automatically keep track of what areas of the disk have been used, and will only write to unused areas. What's more, you never have to know exactly where on the disk a particular file is stored — the DOS will read and update a directory of the files on the disk. All you have to do is remember the name of the file.

Using CP/M

CP/M does all this and more. Assuming that you have a working and installed copy of CP/M on your system, then it's easy to use. Once you reset the system, it should automatically boot CP/M into memory from the disk and run it. The console should display a sign-on message, followed by the prompt A .

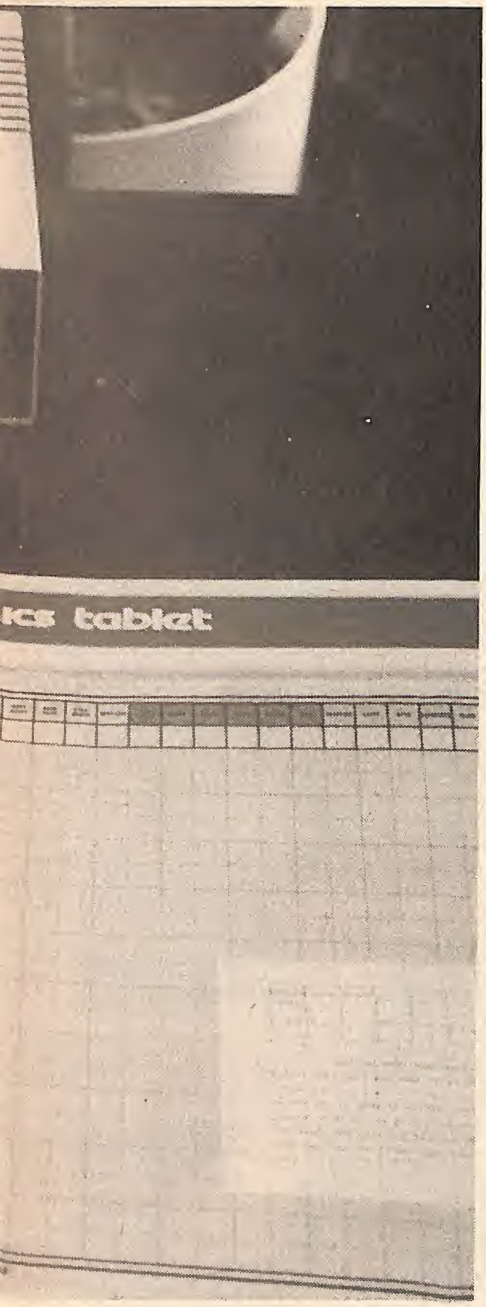
This indicates CP/M is running and that drive A is the current drive; in other words that all file references are to files on drive A unless otherwise specified. To run a machine-code utility program, all you have to do is type in the name of the program: to run Microsoft BASIC, for example, one just types MBASIC and BASIC should sign on shortly after.

File names in CP/M all follow the same pattern: up to eight characters of primary name, followed by a period and a three-character extension. Looking at the disk I'm editing this article on, for example, I can see: MBASIC.COM, a command file; WSMSGS.OVR, the word-processing program WordStar's messages OVeRlay file; CPMINTNTRO.BAK, a backup version of this article; VB3.ASM, an assembly language source file; CMAC.LIB, a macro assembler library file; GRAFIX.C, a C (language) source file; GRAFIX. CRL, a C relocatable object file; ICRT.SYM, symbol table file; and so on.

Generally speaking file names cannot contain punctuation symbols — the reason for this will soon become clear as we look at CP/M's wild-card matching of file names.

The command DIR will print out a directory of all the files on the current disk drive. To obtain a directory for another drive, the drive name is merely appended to the command; DIR B: would give a directory of drive B.

If you don't want a full directory, but merely want to know the names of the files you've generated while working on a



In the stable of unlikely CP/M users is the Apple II, which derives a great deal of its flexibility from the system. Other users of CP/M are just as unlikely, but just as greatful they use it.

video board driver, for example, you might just type DIR VB3.* to get a listing of all files with that prefix.

This * matches any extension; similarly, you can type DIR *.ASM to get a catalogue of assembly language files on the disk.

The command DIR W*.* would match all the files with names beginning with W.

To refer to files that are not on the current drive, prefix their names with the name of the drive; for example DIR B:*.ASM would list all the assembly language files on drive B.

Built-in Commands

CP/M has a number of built-in commands; DIR is one example. Another is TYPE, which lists the contents of a file — this command will not accept wild-card matches. ERA erases a file, or group of files, from the disk.

REN renames a file; for example REN S.BAS = SINEPLOT.BAS will rename SINEPLOT. BAS to S.BAS. SAVE n filename will save n pages (256 bytes) from the transient program area and name it filename. This is useful for saving the debugged versions of machine language programs.

PIP

The other major utility supplied with CP/M is PIP (Peripheral Interchange Program). Although most people use it simply to transfer files between disks, PIP is capable of a lot more.

To transfer a file between disks, the procedure is to type

PIP B:=Afilename.typ

which copies the file from drive A to drive B. After the file name, one can as an option, put a string of parameters in square brackets. These paramenters give PIP a lot of its power.

For example, the V parameter causes PIP to verify that a file was written correctly to the destination disk. The L parameter will translate all upper case letters to lower case, while the U parameter does the opposite. th N parameter adds line numbers to a file. Using the various parameters, one can change the lengths of pages in a file and a number of other quite fancy tricks. The trouble is, one uses these techniques so infrequently one tends to forget what is possible.

PIP recognises CP/M's wild-card expansions, and can transfer a number of files at a time. For example,

PIP B:=A*.COM

will transfer all the programs on A to B.

As well as transferring files between disks, PIP can also operate between the various peripheral devices such as the console, paper tape reader and punch, and the printer. The command

PIP A:TFILE.COM=RDR:

will read the contents of a paper tape from the reader into file TFILE.COM on drive A.

Other CP/M utilities

The CP/M editor, ED, is a very straightforward and simple editor, based loosely on the editors found on most mainframes. It makes no assumptions about the console hardware, and so doesn't have any cursor move or video editing functions. Most users will soon buy a more sophisticated editor, so I don't propose to describe ED here.

The CP/M assembler is an 8080 assembler, with conditional assembly, but no macros. It reads input from a file called name.ASM and outputs an 'Inter hex format' file called name.HEX. The user then runs the LOAD utility to convert the hex file into an executable program file called name.COM. The COM file can now be run, just by typing 'name' after the console prompt.

The complete CP/M system normally lives on the outermost two tracks of the floppy disk, and has to be put there by a special program called SYSGEN. When sysgen is run, it asks the user whether the source of the system is one of the disk drives, in which case the resultant system is a straight copy, or whether the system is already in memory following modification. This facility allows the user to customise the system in various ways.

CP/M is normally located at the top of the memory in the user's computer, so that depending on how much memory you have, your version of CP/M will be located at a different address. If you should add more memory to your system, you will have to relocate CP/M in memory in order to use it. This is done using the MOVCPM utility, which can automatically relocate CP/M for any size system.

A DUMP utility is provided to display the contents of a disk file on the console in hex. Another useful utility is SUBMIT, which allows you to automatically execute a whole string of system commands, one after the other. This is particularly useful when you are debugging a machine code program, then editing, reassembling, linking, loading and executing a file time and time again. Instead of having to type the commands at the console repetitively, you just put them into a submit file, and SUBMIT it.

Transient Commands

As well as the built-in commands, CP/M supports what are called transient commands. These are actually programs which load into the 'transient program

area' of memory, which starts at location 0100H for standard systems and 4300H for TRS-80s and the like. Several of these transient commands are supplied with CP/M: the editor, for example, as well as the assembler.

The names of transient command files end in .COM (command), and they are run simply by typing in the primary name of the command. Some of the transient commands are very powerful indeed, particularly STAT and PIP.

The STAT utility provides statistical information on the amount of free space left on the disks. Simply typing STAT, for example, will return a message like: A: R/W, Space: 276K. To get the amount of space on drive B, you type STAT B: Stat does a lot more than that, though. It will also provide information about individual files. For example, STAT WUMPUS.BAS tells you the file WUMPUS.BAS occupies 24 records and is 4 Kbytes in length, that it is contained in one 16K logical extent and is read/write, as opposed to read-only. If the filename apears in parentheses, it would indicate that the file has the system attribute set, and would therefore not be shown in a directory listing.

```
Recs  Bytes  Ext  Acc
24    4k     1    R/W A:WUMPUS.BAS
Bytes Remaining On A: 276k
```

STAT can be used to set a file to read-only; for example; STAT WUMPUS.BAS $R/O would make the previous file read-only. It can also make entire disks read-only, at least between warm boots. To remind yourself of the capabilities of STAT, you can use the program itself; STAT VAL will type:

```
Temp R/O Disk: d: = R/O
Set Indicator: d:filename.typ R/O $R/W $SYS $DIR
disk Status : DSK: d:DSK:
User Status : USR:
Iobyte Assign:
CON: = TTY: CRT: BAT: UC1
RDR: = TTY: PTR: UR1: UR2
PUN: = TTY: PTP: UP1: UP2
LST: = TTY: CRT: LPT: UL1:
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Next issue, in the concluding part of this article, I'll explain how CP/M works (briefly) and how to call it from programs.

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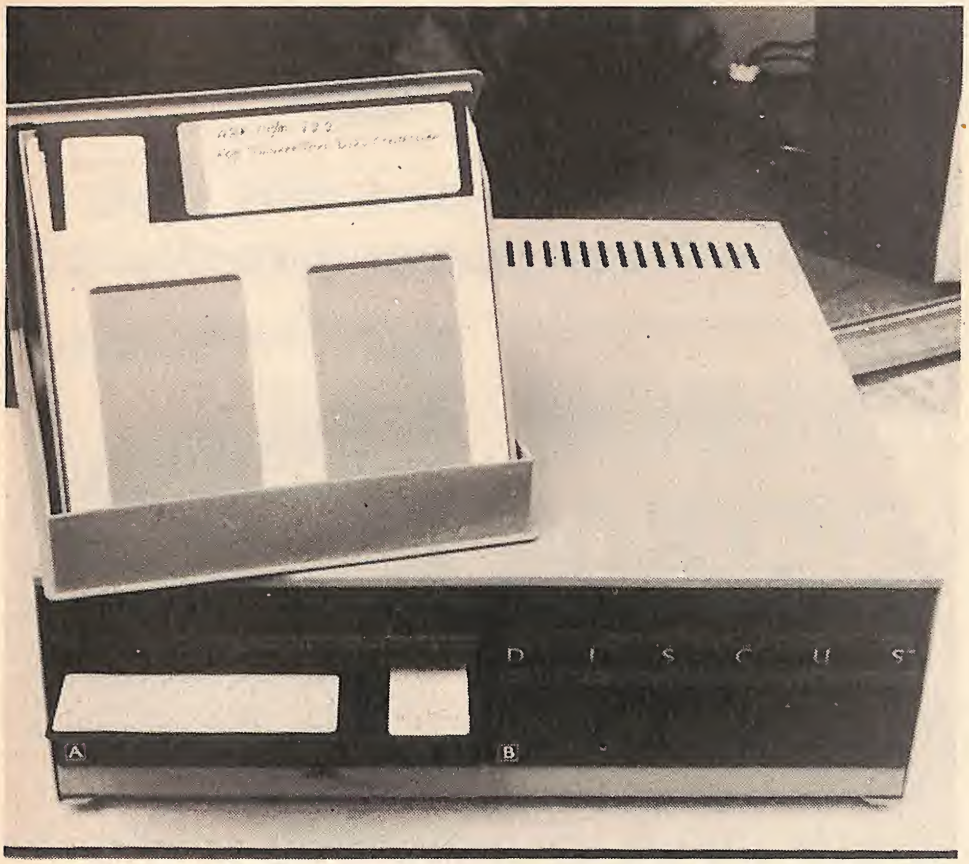

The Discus 2D, reviewed in our first issue, is another CP/M user. In fact, the list of users is long and not always straightforward. There are the complex and powerful machines like the Discus which derive much of their strength from the CP/M. The NorthStar Horizon is another example.

Built-in commands

ERA	erase a file
DIR	list directory to console
REN	rename a file
SAVE	save a binary image
TYPE	list a file to console

Transient commands

STAT	statistics about storage, status of peripherals
ASM	the standard CP/M assembler
LOAD	loads an Intel hex format file into a COM file
DDT	Dynamic Debugging Tool
PIP	Peripheral Interchange Program
ED	editor program
SYSGEN	puts system image onto a fresh diskette
SUBMIT	batch processing command
DUMP	display the contents of a file in hex
MOVCPM	moves the CP/M system in memory
XSUB	extended SUBMIT feature

Certain other utilities may be supplied with your copy of CP/M:

FORMAT	formats a diskette
EBASIC	BASIC-E compiler
RUN	BASIC-E run-time package

as well as files of code:

BIOS.ASM	standard BIOS for Intel MDS -800
DEBLOCK.ASM	deblocking algorithm for double-density systems
DISKDEF.LIB	disk definition library

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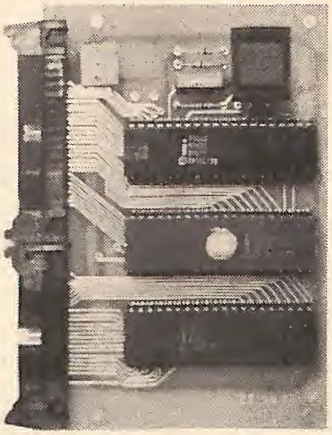

Mascon Consulting Services Pty Ltd an all Australian company has designed a small microprocessor board MS85/38 for OEM users to fit into the I/O intensive area.

The board, measuring 80 by 120 mms, contains only three LSI chips but gives the user a total of 38 I/O lines plus serial communications capability. Based around the 8085 microprocessor it provides 38 I/O lines arranged as one 6 bit port and four 8 bit ports. It contains 2K of EPROM and 256 bytes of RAM. It has on board one 14 bit programmable counter/timer. It operates at a crystal frequency of 3.276 MHz but other frequencies can be supplied to special order. Power supply requirements are 5V d.c. at 0.5 amps.

Connection to the outside world is via two ribbon connectors, one 26 way and one 34 way.

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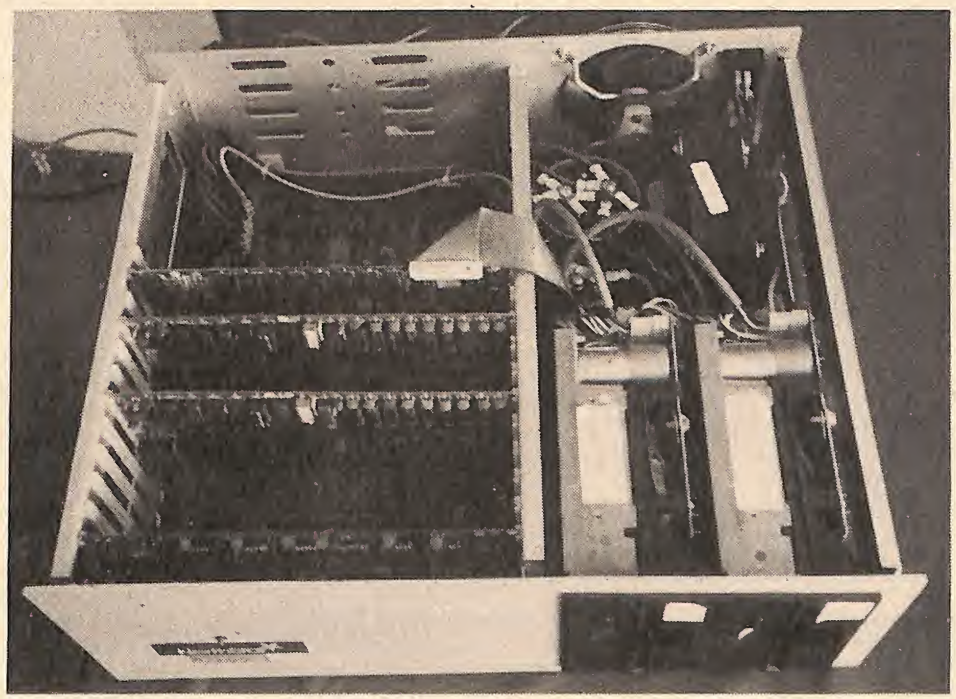
DEALERS ENQUIRIES WELCOME

If you ask for a NorthStar Horizon you'll look in vain for the TV monitor or a keyboard; this computer is literally the box of tricks you've heard about but never seen.

Twin disk drives and advice from the NorthStar supplier on what goodies to attach and you have a computer the small-business world loves. . .

THE NORTHSTAR HORIZON



A Real Box Of Tricks

THE NORTH STAR Horizon is a Z-80 based S-100 microcomputer well suited to the needs of small and not-so-small businesses. The system is robust and has an extensive software base for the North Star DOS; additionally North Star has recently started to officially support CP/M for its systems, giving users factory-approved access to the wealth of quality CP/M applications programs, languages, utilities and development software.

The Company

North Star first made its name with disk subsystems for 8080 microcomputers back in the days when *any* disk system for a microcomputer was big news. The North Star MDS (Micro Disk System) was a reliable, solid product that came with a reasonable DOS and a very good BASIC interpreter. The extensive base of North Star DOS software has its roots in North Star's early dominance of the microcomputer disk market. Owners of Processor Technology SOL computers bought MDSs in large enough quantities to enable North Star to expand its line into the then new Z-80 microcomputer realm with a CPU card and eventually the Horizon computer.

your computer REVIEW

The Horizon was quickly recognised as a robust, high performance micro and established a strong position in the market place. In the meantime the general floppy disk subsystem market was moving toward 8 inch systems so the company has concentrated on developing system business.

The Horizon system continues to be developed with the introduction of a hard disk subsystem, denser memory and I/O boards, improvements to the North Star DOS and the introduction of a multi-user operating system.

The Box

The Horizon mainframe is a very substantial piece of metal work, made out of thick aluminium and internally braced to positively prevent any flexing. The power supply has a capacity of 15 Amps at 5V with an exhaust fan and good airflow pattern to keep internal temperatures even. The front panel is cut out to take two minifloppy disk drives and has a LED "power on" indicator. The paddle type reset switch is wisely located at the rear (front panel resets are a potential disaster for a business system) next to the rocker type power switch. The rear panel has 8 cutouts for DB25 (RS 232C) connectors and 4 holes for switches or other connectors.

The Horizon motherboard has 12 S-100 slots as well as what amounts to another S-100 card's worth of system support functions permanently attached at the rear. The system support facilities include two serial I/O ports, one parallel input and one parallel output port, real time clock and power regulators for the minifloppy disk drives. All power to the motherboard goes via tag connectors.

The CPU

The North Star Z-80 CPU card is a proven design that has remained substantially unchanged for several years. The cards were developed before the Horizon system was made and have a range of jumper options allowing configuration for systems other than the Horizon, i.e. there is a socket for an IMSAI style front panel. The board operates at 4MHz clock rate. A power on jump circuit is provided on board and while this can be set to jump to any byte address, it is normally configured to jump to the Disk controller Boot at E800H. There is also provision for a 2708 EPROM on board which is addressable on 1K boundaries.

Memory

The two sizes of North Star memory board are dynamic types with an unusual hardware parity check option available. An extra bit is stored with each byte and is used to detect hardware parity errors; unfortunately the system software does not support this feature properly and so it is an option. The boards will respond to port controlled style bank select, allowing multiple banks of memory for multi-user systems. The system software has a memory test optimised for these boards which allows the quick identification of faulty chips. In over 2 years of use I have encountered only 2 faulty memory chips on a 16K board and they were in the first six months of operation.

The Disk Controller

The North Star disk controller will support up to 4 minifloppy disk drives with double density and double sided operation. The original North Star controller was single density, single-sided only and the early Horizons were shipped with it. The controller uses 'discreet' logic rather than one of the newer LSI disk controller chips used by most other manufacturers. While the disk systems are quite reliable, the design of this controller makes it hard to service.

The North Star disk system uses a hard sectored (10 sector hole) diskette, this is a legacy of their early entry into the disk subsystem field. The technology of that time made hard sectoring mandatory for economical design of a minifloppy disk system of useable capacity. North Star has stuck to its original disk format for compatibility; the present controller can still read and write the original single density disks. The standard disk controller uses IK of memory space for driver firmware in ROM and memory mapped I/O located at E800H, which means that memory above this address cannot be used for normal programs. The firmware is not readily accessible from user software. Disk technology has come a long way in four years and the North Star controller is definitely 'old' technology, and is in my mind the weakest component in the system.

My double density disk controller developed problems sometime ago and has not been entirely satisfactory since, despite service by the original dealer.

North Star DOS

In common with the disk hardware the Release 5 DOS is showing its age. The DOS uses static allocation of disk space, making 'compaction' operations a frequent necessity with any reasonable amount of disk usage. Also a cumbersome explicit create, type and save operation is necessary to open a new file from the DOS. The DOS is usable and there is no lack of software available for it but CP/M runs rings around it and is also readily available preconfigured for the North Star system. The only redeeming feature of the DOS is that it supports an excellent BASIC.

An elementary monitor program is supplied with the DOS along with a small number of utilities, but there is no debugger or assembler available from North Star, though they can be purchased from other sources.

North Star BASIC

The truly outstanding piece of software with the North Star Horizon is the BASIC interpreter. It is a good extended disk BASIC (within the limitations of the DOS) with some very useful features. As it is an 'HP type' BASIC (by contrast Microsoft BASICs are 'DEC type') there is virtually no restriction on string length. The internal editor is also quite good. There are several different 'precisions' available up to 14 digits, also the BASIC is supplied in a version which can use the North Star Hardware Floating Point card.

The BASIC is extremely well documented. While the manual is not intended as a general tutorial on BASIC it does provide a very thorough description of the North Star implementation of BASIC as well as providing several non-trivial sample routines and programs. The manual is well laid out and more importantly well indexed for quick reference. The Release 5 version has a standard load address of 2D00H but I believe the latest release is relocatable to load at any address reasonable for the operating system.

Hardware Standards

A proposed IEEE standard for the S-100 bus is ready for final approval. After several years of minor chaos with S-100 board compatibility (particularly between the minor manufacturers) a definitive standard will soon officially exist. In fact the major aspects of the standard have been clear for over 18 months and several manufacturers of S-100 equipment have been turning out boards which will satisfactorily perform to most if not all parameters of the new standard for at least that amount of time. The North Star hardware does not meet the IEEE standard, though it will probably work satisfactorily with a lot of other S-100 equipment.

I have had several specific examples of incompatibilities between IEEE 696 standard boards and the Horizon. There are some internal race state conditions within the CPU card which can affect its performance with other boards, 8 inch disk subsystems in particular. The bus is not terminated and this has caused me some minor problems; even a terminator card would not clear them up. I could not boot up my Morrow Disk Jockey 2DF disk controller card while it was sitting on an extender card in the North Star motherboard, but when I installed a new terminated motherboard in my Horizon I had no trouble booting the Disk Jockey on an extender card.

My solution to this problem has been a slow upgrade to a full IEEE 696 standard system in my Horizon chassis. I now use none of my original North Star boards at all. However the point is that the Horizon has served me as a good springboard into a completely standardised system. While this may seem like a sort of backhanded compliment, it *is* a compliment. The North Star Horizon was adaptable to this slow upgrade in a way that few other 'packaged' computer systems would be.

I needed to standardise my system because it is used for advanced hardware and software system development. These are not factors which would affect the average business user. The Horizon will perform usefully as an integrated hardware package, but I would recommend thorough testing of S-100 boards from

other manufacturers before purchase if you have to step outside the range of boards available from North Star.

The Disk System

The minifloppy drives supplied with the Horizon have only a relatively limited capacity, even in the 'Quad Density' (actually double sided density) format. For any serious business use a high capacity 8 inch floppy disk system (not available from North Star) or a hard disk would be essential. This is a general criticism of minifloppy based computers, not just the North Star. While it is possible to configure minifloppy-based business systems, the discipline of frequent disk swapping is bound to lead to operator frustrations and possible errors.

The only saving grace of minifloppy systems is that they are compact and if it is essential that you have a transportable computer, this aspect can outweigh the disadvantages.

Higher capacity minifloppies are on the way as are small hard disks of the same physical size.

Software

At least one supplier of North Star Horizons is marketing a software package called 'Trader' for the system. This package is being supported with orientation seminars, training and is written for local conditions. I haven't seen the package but have heard some good reports about it. Good business software written for Australian conditions is not easy to come by, so have a close look at 'Trader'. If it does what you want it to do, that may be reason enough enough alone to buy a Horizon.

There are some major hardware and software support items available from independent suppliers. Micro Mike's runs large ads in the US computer magazines advertising interface software to allow Morrow Design disk systems to be used with North Star hardware. The programs work too. I bought their DOSCHG program which allowed me to run my Morrow Disk Jockey 2D disk subsystem as two extra large capacity drives under North Star DOS. They have interfaces for the Morrow hard disks, a Z-80 BASIC that is a faster version of North Star BASIC and a series of subroutines for North Star BASIC that makes screen handling and form design a snap.

The 'Software Review' has a program called 'Connector' that allows the Morrow disk Jockey 2D to be used as the C and D drives in a North Star CP/M system. It also has a marvellous single stepping debugger for North Star BASIC. DMA Associates has an operating system called DMA-DOS (CP/M compatible, supposedly) which allows the use of the North Star disk system and a Tarbell disk system together.

The Wrap Up

There are not that many alternative package systems available here today which can match North Star Horizon, but the market is rapidly changing and competitive systems are starting to appear. I bought my Horizon 2 years ago and consider I have had excellent value for my original investment — I have been able to put together the system I am using today because I bought a North Star. Perhaps a North Star Horizon can fulfil your immediate requirements and be your springboard to better things. □

—Bill Bolton

Specifications and Report Card

Unit:	NorthStar Horizon
Made By:	NorthStar Computers, US.
Processor:	Zilog Z-80
Clock Speed:	4 MHz
RAM:	varies
ROM	bootstrap
I/O	serial, Rs 232C plus expansion through S100 bus
Languages:	BASIC, FORTRAN, PASCAL plus others supported by CP/M
Keyboard:	none
Display:	none
Graphics:	none
Peripherals:	twin disk drives
Best points	reliable, expandable; well-supported software
Worst points:	not true S100 standard; should have 8 inch disks

Ratings:	**excellent**	**good**	**well, maybe**	**poor**
Documentation	✓			
Ease of Use		✓		
Functionality	✓			
Support	✓			
Value-for-money		✓		

Extras included:	not applicable
Options:	hard disk available, expands to multi-user
Price:	$5500
Review unit from:	not applicable

BEGINNERS

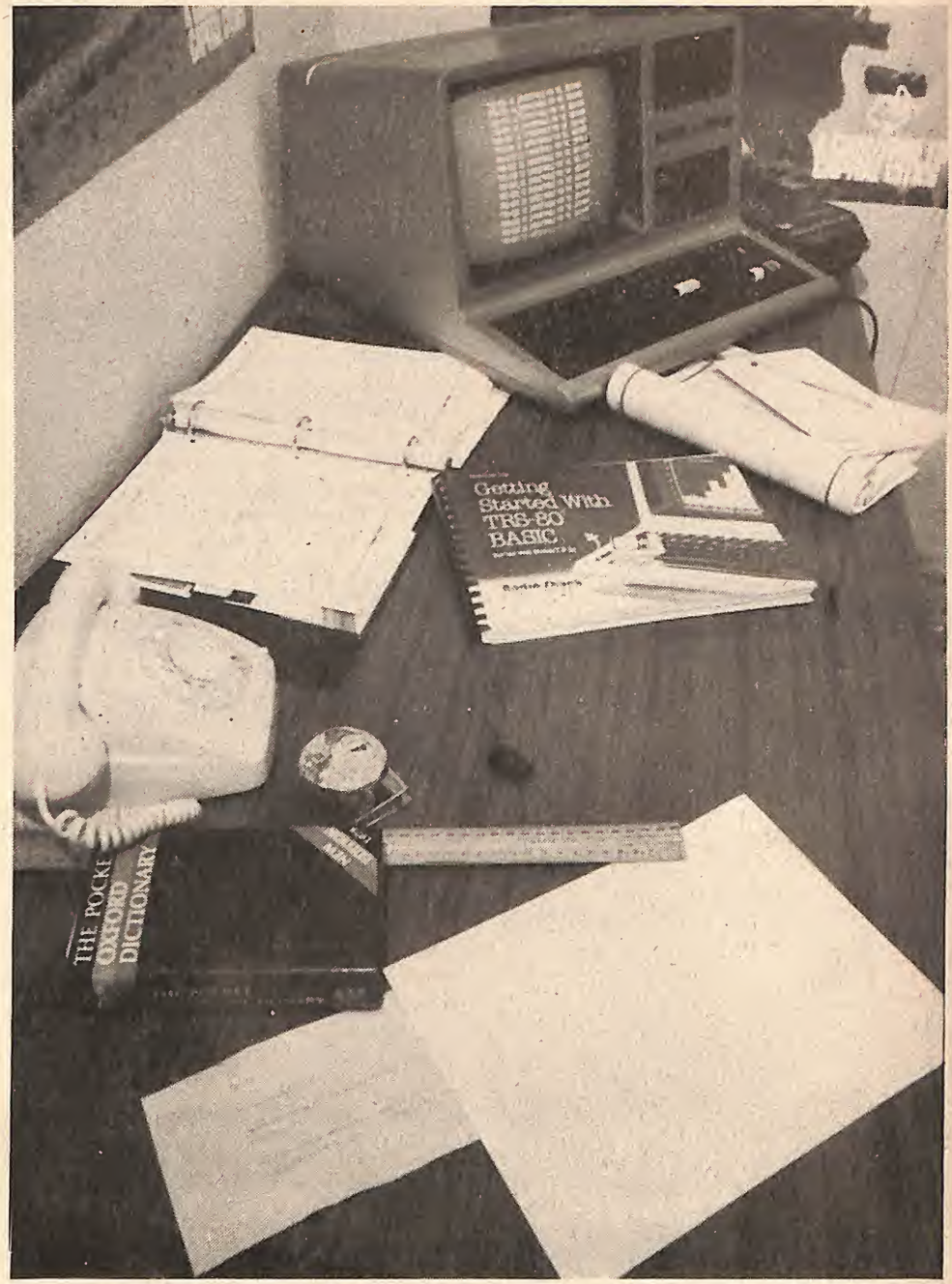
ON THE HORIZON

THE NORTHSTAR HORIZON Is your original box of tricks. Up to now you may have associated a computer with a keyboard and a TV screen. But a computer really is nothing more than a box of tricks. The keyboard's there to tell the computer what to do, the TV screen so you can see what it's doing.

The NorthStar is billed as a business computer, or a piece of complex machinery for the hardware enthusiast. It's probably not the sort of thing a beginner would waltz into knowingly; but there again there are beginners teetering on the edge of computer courses, businessment who need a reliable and powerful micro at work, and no doubt one or two other beginners who could conceivably dance to the tune of the NorthSar.

To see it in the flesh is to walk away uninspired. It's no more than a grey box with two holes in the front where the disk drives go, disk drives (and the floppy diskettes which go on them) being one way, and the best, for the NorthStar to get its instructions or for information to be stored for later use.

The NorthStar has a good track record. As improvements come through onto the market, they're compatible with existing bits and pieces. In the world of computers, an improved version doesn't mean the first one was lousy. Things happen rather fast in the land of micros.



Despite manufacturing the most popular computer in the world, the Tandy Corporation isn't resting on its laurels. The range has been considerably expanded, by offering firstly peripherals and, recently, completely new systems. Latest in the line is the TRS-80 Model III. LES BELL reports.

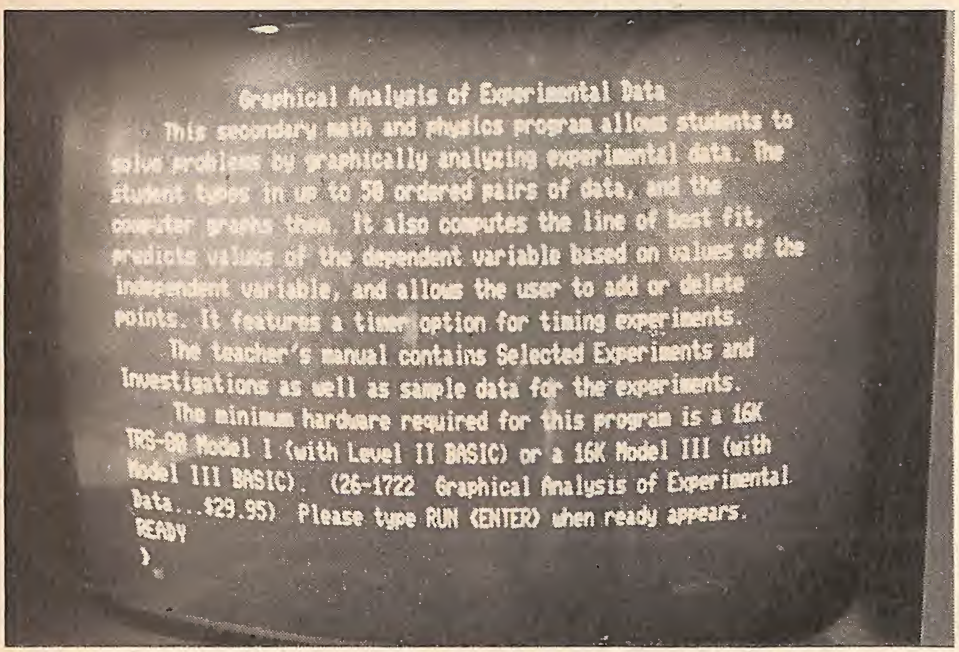
TRS-80 MODEL III
Is It Three Times As Good?

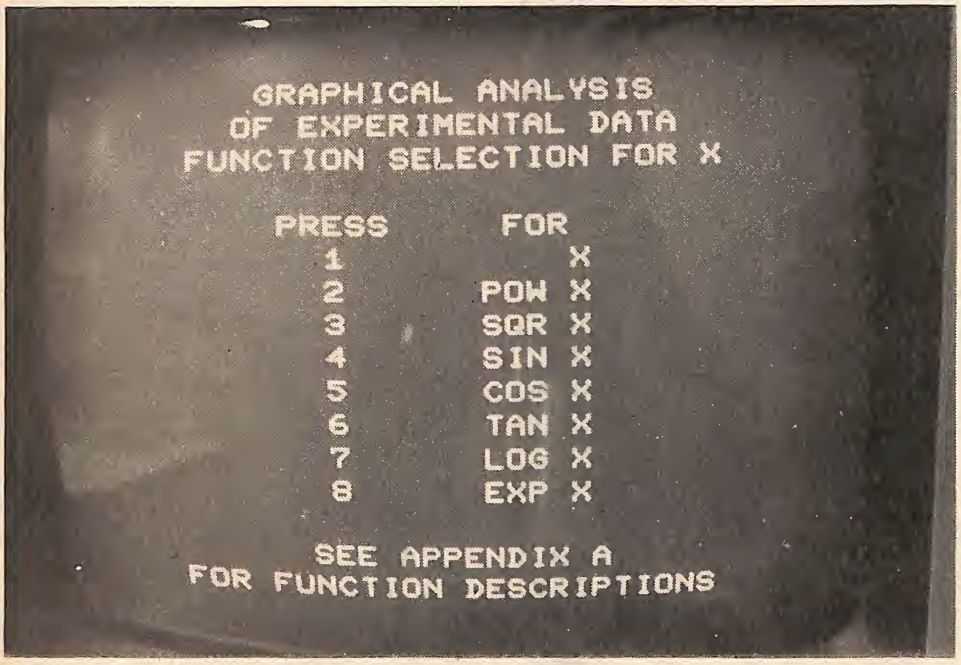
your computer REVIEW

WHEN THE original TRS-80 appeared, I'm afraid I wasn't too complimentary. In fact, I panned it. With only 4K of memory, and Level 1 BASIC, it wasn't exactly a sophisticated machine. Also, Level 2 BASIC and disks hadn't appeared at that time, so the future for the TRS-80 looked a bit grim.

That's why I'm surprised Tandy have let me within a mile of one of their computers, let alone provide me with the ammunition to take some more shots at them. I can only conclude that either they are exceptionally fair-minded people or they are supremely confident they've got a good product.

The TRS-80 Model III is really a successor to the Model I, though Tandy will deny this. What's been happening is that an increasing number of people have been





The Tandy TRS-80 Model III is backed by some clever and innovative software, including, left, the examples from an education program.

buying Model I's, then quickly upgrading with an expansion box, disks and printer. Now that's a clumsy, expensive way to buy a computer. If you know you're going to need disk drives, it makes sense to buy them with the computer, or at least buy a computer to which they can be added without too much trouble.

The Model III is Tandy's answer to that need. The model we reviewed had two disk drives and 32 Kbytes of RAM, all in a single enclosure with only one power card. No more problems with untangling yourself from the power cords.

Construction

It looks like an outsized video terminal, except for the two 5¼ inch disk drives to the right of the screen. It's finished in the standard TRS-80 silver and black. Personally I can't stand that black and silver hi-tech newspeak look. At a time when people need to become accustomed to a computer environment, we need machines that look soft, warm and friendly, not like props for a Flash Gordon movie.

Because of its bulk, the Model III is a little awkward for one person to move, not that you often need to.

The fact that the keyboard is not detachable from the main enclosure might bother some people, but I found that it was quite easy to type on for long periods without fatigue. The keyboard is normally set to upper case only, which is ideal for writing BASIC programs, but it can be shifted down to full upper/lower case by hitting 'shift 0' — which is not marked on the keyboard and confused me when it first happened accidentally.

The reset switch is sensibly positioned right by the keyboard — you don't have to go fumbling about in the dark spaces behind the computer — but it's also recessed so that it's very difficult to accidentally reset.

Resetting the computer on power-on will boot the operating system off drive zero; the problem is, which drive is drive zero? There was no marking on the disk drives. By trial and error, after giving up on the manual, we discovered it was the lower drive.

TRSDOS

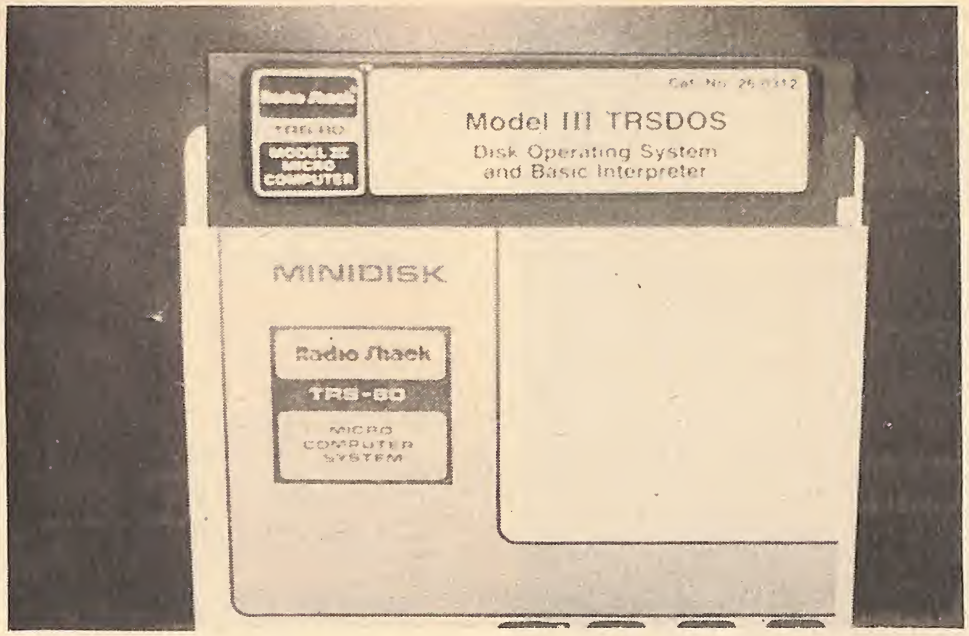
The disk operating system, called TRSDOS (Tandy coyly suggest you pronounce it triss-doss, *not* trash-doss as I tend to do), boots automatically, and the first thing it does is draw a picture of the computer on its own screen. Cute. It then asks you to supply the correct date and time, and keeps asking until you've supplied it in the correct format.

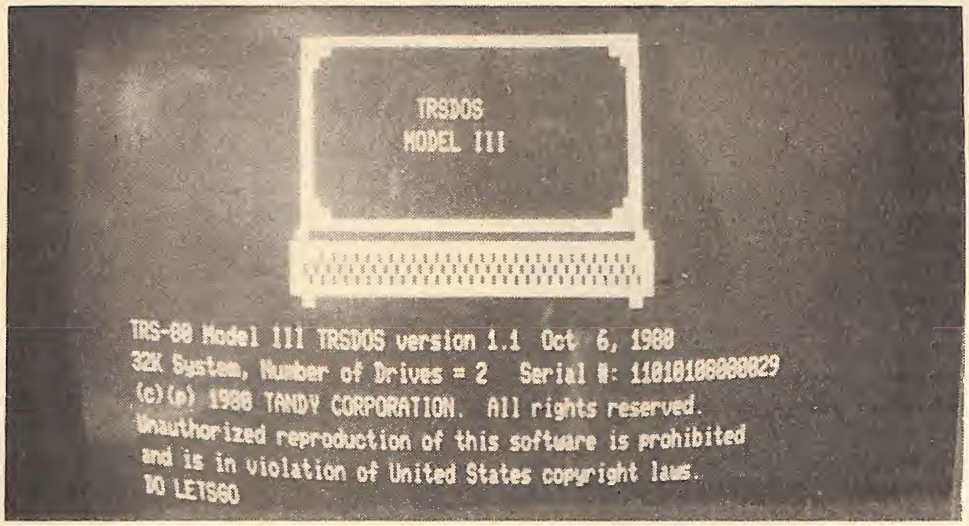
The Model III incorporates a real-time clock circuit which can be used to display the time and date on the screen, or to supply that information to your programs, etc. It would be a really handy feature — if only it worked. The clock is obviously driven from the mains which is 60 Hz in the States and 50 Hz here. The result is that the clock runs at 5/6 of correct speed in Australia. In any case, the clock is stopped during any disk or cassette data transfers, so it will gradually go slow anyway. I don't really mind about that, but I do resent the computer asking me the time when it can't keep time correctly itself.

Having said my piece, let's move on to the good points, of which the Model III has many. For a start, for the owner who doesn't have disks, there's a high-speed tape mode which runs three times faster than the old Model I. Saving and loading programs is much faster.

The BASIC for the machine is very similar to Model I BASIC. It's Microsoft BASIC, with a few bells and whistles added for the machine.

What surprised me most about the machine was the speed of the BASIC. On a trial calculation of prime numbers,





The TRS-80 Model III has its problems, but generally it's a well-integrated package. The documentation, though, leaves a little to be desired in some departments.

the TRS-80 Model III took just over 29 minutes, compared to 26 minutes for a good old 2MHz 8080 running Microsoft BASIC. On the other hand, it could be that although the clock speed is claimed at 2.2 MHz, the memory isn't that fast, and so the processor is running with a wait state inserted. All this goes to show that the clock speed is not necessarily a satisfactory indicator of system performance.

The BASIC is interesting because of its number of commands. For example, the statement CMD"O" 20,A$ will alphabetically sort the string A$ into order with substrings of length 20. That is a very powerful capability to have in your computer. Other commands allow the user to list the disk directory on the screen, turn the clock on and off, and access some of the disk operating system commands.

TRDOS offers a wide range of facilities. In particular, it has extremely comprehensive password protection for files, allowing the user to specify one of six levels of protection. Files can be execute only, read-only, and so on. Frankly, I tend to feel this is a little overdone — with a small computer, file security is most easily obtained by removing your diskettes and locking them away, but I can think of a few occasions, particularly on systems with only a single disk drive, where password protection would have been useful.

TRSDOS has a number of library commands which are used to manage the disk system. The most interesting to me was the HELP command. This lists out the complete list of library commands, and if you type HELP DIR, for example, it provides helpful information on how to use the DIR command.

The Model III has most of the Model I commands and a good many more from Model II. BUILD and DO let a series of commands be carried out automatically whenever switching on. SETCOM initialises the serial port for data communications. CONVRT makes the majority of single density Model I software compatible with the double-density Model III. And if you get any of that wrong, the ERROR command is very helpful. If you blunder it tells you, but it also puts you on a fast path to finding and curing the mistake.

Documentation

Documentation varied in quality. The disk manual, in particular, was only a preliminary version and it was nowhere near the quality of the other manuals. Even for an experienced user of other disk systems, the manual was cumbersome to use, and difficult to read through. No matter how experienced with other machines, every buyer of the Model III disk system is still a beginner on that particular machine, and so I feel that the disk system manual should be written in a similar tutorial style to the other manuals.

The introduction to BASIC manual,

which applies to the built-in BASICs of both the Model I and the Model III, was very clearly written and was one of the best tutorials on BASIC that I have seen.

Similarly, the owner's manual for the machine was well put together and easy to read. There were a few glaring omissions, particularly in the Disk System Manual, which, for example, omitted to inform the user which was drive 0 and which was drive 1.

There is some other material including a quick reference guide for TRSDOS, and an introduction to personal computers for the novice buyer.

Overall

The TRS-80 Model III is a well-integrated package, with only a few minor annoying problems. The slow clock, for example, is unlikely to be a serious problem to most users. It has a comprehensive range of software available, and Tandy can be expected to seriously support the product.

For a small business user, the TRS-80 Model III is a pretty good buy and as a personal computer it will compete seriously with most of the machines on the market. Prices range from about $1000 up to about $5500, depending on what Model III you buy.

Our thanks to Tandy for providing a sample for review — I can only state that their confidence in the machine is justified.

Specifications and Report Card

Unit:	Tandy TRS-80 Model III
Made By:	Tandy Corporation, US
Processor:	Zilog Z-80
Clock Speed:	2.2 MHz
RAM:	32 Kbytes
ROM	16 Kbytes
I/O	integrated screen, keyboard, cassette, disks
Languages:	BASIC, disk-extended BASIC
Keyboard:	standard QWERTY plus numeric pad
Display:	64 × 16 upper and lower case
Graphics:	28 × 48 pixels
Peripherals:	disk drives, printers
Best points	good screen, helpful problem solving info.
Worst points:	poor documents for beginners

Ratings:	**excellent**	**good**	**well, maybe**	**poor**
Documentation		✓		
Ease of Use			✓	
Functionality		✓		
Support		✓		
Value-for-money		✓		

Extras included:	not applicable
Options:	not applicable
Price:	vary from about $1000 to $5500
Review unit from:	Tandy Corporation

BEGINNERS

NICE LEGS — SHAME ABOUT THE FACE

THE TANDY TRS-80 Model III comes in several versions — that doesn't make life easy for the first-time buyer, no matter what the salesmen say. If you know only a little, or indeed nothing, about computers, it's going to be of no help to you to know the Model III comes with or without disk drives, with 16K or 32K of memory, and so on.

The confusion caused by the variations on the Model III theme can only be cleared up satisfactorily for the beginner by knowledgeable and paient salespeople, (who do exist) or by a friend or by a TRS-80 club.

Our TRS-80 test unit was one of the "up market" versions. It had twin disc drives — the drives run diskettes which are something like an LP record; the diskettes store information (data) or they can instruct the computer (program).

Ours also had a large memory capacity. Other model IIIs have smaller memories.

The Model III, if you like "futuristic" styling, is attractive and functional, although the paint scheme is, um, different. Boring?

The keyboard, for putting information in to the computer or giving it instructions, is easy to use and the monitor, a TV screen which lets you see what the computer is on about, gives an eyestrain-free picture.

The computer speaks to itself and you "speak" to it in a computing language called BASIC. Because it runs disk drives, it has another "language" called a Disk Operating System (DOS) which controls the operation of the disk drives. DOS means that you can keep information on diskettes and use them again later without losing that information. A disk drive is much faster than using a cassette recorder to put a program into the computer, or retrieve information. But cassette recorders, although much slower, are significantly cheaper.

The operating and user manuals which came with our test Model III (the one with disk drives) were, from a beginners point of view, poor to the point of being awful.

No doubt an experienced hand would soon sort out what was what from the various manuals and have the computer up and running with no effort or sweat.

But we're not talking about experienced computer hands. We're talking about people who deserve to be spoken to in an understandable language. It's called English, minus jargon, minus complicated technical language.

Once you do master the computer and begin to know a little about computing and programming, then the TRS-80 is a good machine to work with. It has some features which make it superior to some other brands.

MIGHTY MITE TAKES ON THE

your computer REVIEW

Our review of Clive Sinclair's ZX80 was a nice one — it deserved to be; the machine works when everything says it shouldn't.

But to meet a ZX80 with muscle, well! The upgraded version is faster, smarter and really made us pause.

LES BELL reports:

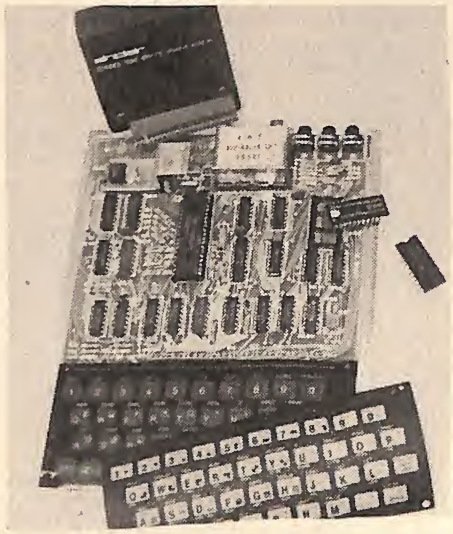
AS I played around with a ZX80 last month, I came to be impressed with the amount of British ingenuity that had gone into its design. The poms are widely admitted to be top-notch software designers and that is reflected in the design of the ZX80. It's a triumph of software and tricky programming over complex hardware.

Interesting aside at this point, especially for owners of ZX80s who have some hardware experience — Don Lancaster's TV Typewriter Cookbook, although I haven't seen a copy recently, explains many of the techniques used by the ZX80's designer in generating its video display. In fact, I suspect that the ZX80 designer must have slept with a copy of the TV typewriter cookbook under his pillow. If you really want to understand the operation of the ZX80 video display, this book would be pretty-well indispensable. But I doubt that you could do much to improve the basic design of the circuitry.

Although the ZX80 is ingenious, it does have some serious omissions, most notably that it does whole number arithmetic only. Most people just aren't used to doing arithmetic with just integers — try adding up the prices on your shopping list for a start. You can't get far without a decimal point.

To correct this deficiency along comes son of ZX80 — alias ZX81, or ZX80 with a new 8K ROM, which is pretty close to the same thing.

The BASIC interpreter and monitor program for the ZX80 is stored inside a 4K ROM, which is the reason why it is limited in power. To increase its capabilities, the obvious solution is to rip out the 4K ROM and put in something a bit bigger — like an 8K ROM. That's what Sinclair is offering



now — the 8K ROM. A kind of fuel-injected V8 version, if you like.

Also to beef up the suspension a little, there's a 16 Kbyte RAM expansion module. First, the new ROM requires a bit more RAM to keep all its variables, cutting down on the machine's internal RAM. This leaves less space for your programs and variables — just when you've got the new souped-up version. Of course, having the new ROM makes it feasible to attempt much longer and more complex programs on the computer, so you really need more RAM space.

What will it do?

The first and most obvious advantage of the new ROM is the ability to do floating point arithmetic — in other words, to deal with decimal fractions rather than whole numbers all the time. This makes the computer a great deal more useful and less tedious to use.

Perhaps owing to Sinclair's background as a calcualtor manufacturer, the ZX80 8K version behaves remarkably like a calculator — an impression that is heightened by the exposition of algebraic precedence in the manual. The internal accuracy of the machine is about 9½ digits; better than most of Sinclair's scientific calculators, but not as good as most of the "serious" scientific calculators. Microsoft BASIC, for example, has an internal accuracy of about 6½ digits in single-precision mode, and about 13 in double-precision.

The 8K ROM offers an unusually full complement of transcendental functions; sin, cos and arctan are usual on computers (tan = sin/cos), but the 8K ROM gives tan, arcsin and arccos as well. Cramming all this into an 8K ROM is bound to be pretty tight so I am a bit dubious about the accuracy of these functions, although I have not tested its accuracy.

The manual does claim that the transcendental functions are calculated to eight digits accuracy. Perhaps an investigation of the accuracy of the machine would make an interesting project for a son of ZX80 owner.

The 8K ROM boasts a square root function, EXP (e to the power x), LN (natural logarithm) and SGN (signum) functions as well as (another reminder of the scientific calculator) a PI function which returns the value of pi (3.14159265. . .). In fact, Sinclair seems almost to be marketing the ZX80 8K ROM version as a super-calculator — which I guess it is.

Because of the added functions, the 8K ROM comes with a replacement keyboard overlay. To get a function on the keyboard, you must first touch the shift key, then the newline key, then the key with the function you want — a rather tedious procedure, but if you're not a good typist it is generally better than typing the whole function name out. I still can't fall in love with that keyboard, though, even though I'm no touch-typist.

More Basic

The BASIC is, in general, much more like Microsoft (TRS-80, PET, etc) BASIC than was the 4K version. This means that ZX80/8K and ZX81 owners will be able to convert programs from magazines a lot more easily than before. It has a full complement of functions, including AND, OR, RND, CHR$ (though not ASCII), LEN, USR(n), and INKEY$. An interesting point is that in 8K BASIC the arguments of functions do have to be enclosed in brackets; while most computers would reject STR$ 735, the ZX80 would accept it.

There are several new statements; COPY will send a copy of the screen to the

UNIVERSE With A Bit Of Extra Help

printer, if it is connected; LOAD will load a named file from tape; PAUSE n will stop the computation for up to n × 32767 fiftieths of a second (if n + 32767, then it pauses until a key is pressed). The display reappears on the screen while the computer is paused.

PLOT m,n blacks in the pixel at m,n on the display (remember that the ZX80 displays black on white). UNPLOT does the reverse. SCROLL moves the display file up one line. A function called AT (similar to the TRS-80's PRINT FUNCTION) sets the next print position on the screen.

A new feature which will appeal to many ZX80 owners is the ability to run the computer in a SLOW mode. In this mode, computation is only performed during the times that the video refresh circuitry is off the top or bottom of the screen. This allows the display to be refreshed while the computer continues to operate. It's not blindingly fast, but it does work.

String handling is one area where the ZX80 is non-standard. However, its string functions are very reminiscent of Hewlett-Packard BASIC, so they have an honourable precedent. I find them easier to use than all that RIGHT$, LEFT$, MID$ stuff in Microsoft BASICs. Chacun a son gout.

The Documents

The manual supplied with the 8K ROM is excellent. I dips me lid to its author, and wish he or her was writing for *Your Computer*. This is one of the best manuals I have seen for any small computer, particularly one as inexpensive as the ZX81. It is extremely comprehensive, right down to explaining the internal operation of the BASIC interpreter. At the same time it is informative and written in straightforward English without being condescending as some American manuals are — 11 out of 10 for documentation.

Incidentally, the manual is actually the manual for the ZX81 computer, which is basically just a ZX80 with some of its discrete logic collected into one chip and with the 8K ROM as standard. There are only minor differences between the two machines and these are explained in the manual.

RAM Expansion

Writing about memory is always a dilemma. As far as the user is concerned, it is the simplest part of the computer and the only criticism you can make of it is whether it remembers or not. The 16k expansion module does remember, but it worries me a little in the mechanical area. It doesn't attach particularly securely to the computer. The connector on our review sample didn't mate very well. I felt that the memory module might come adrift at any moment; still, that wouldn't be a hard problem to fix.

Last month I wrote of the ZX80: "When I grow up I want to be a real computer," and the ZX81 or 8K ROM is certainly a step along the way. I still don't understand how they managed to cram so much into only 8K, but I'd have to say that the ZX81 still isn't a real computer, simply because of its limited expansion capabilities. Given time and ingenuity, though, that problem will doubtless be solved. It's not a calculator; if we're honest, it's not a real full-blown computer; I don't know what it is — but I do know it performs well and offers excellent value for money. □

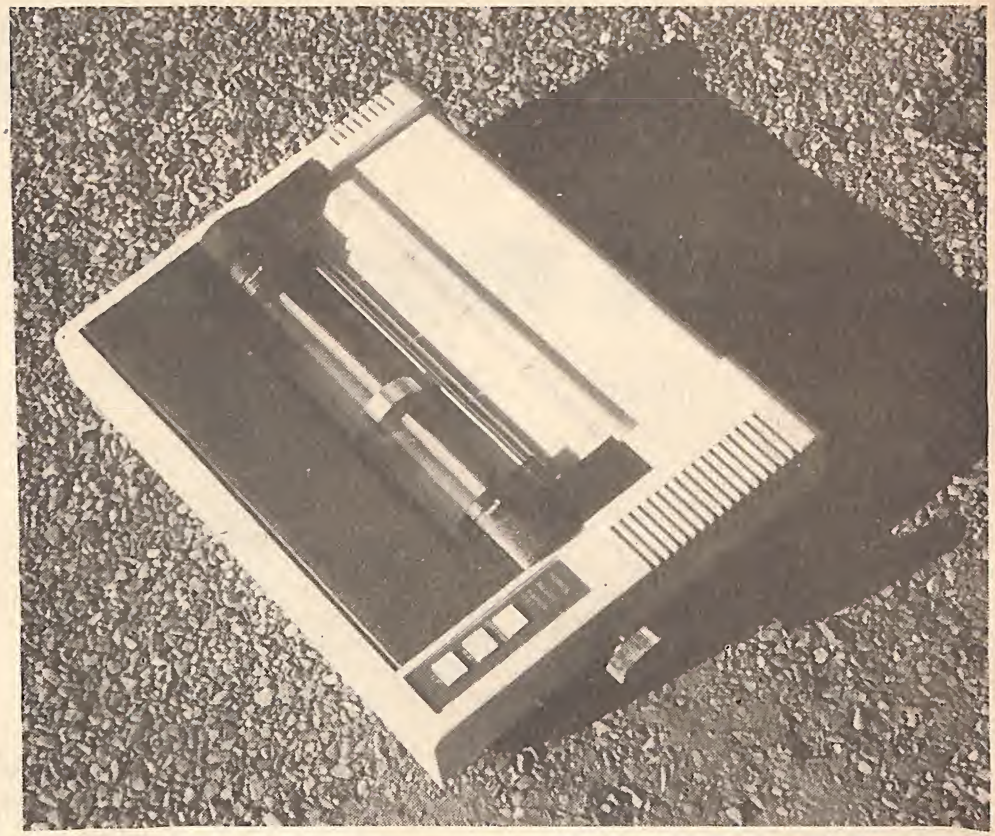
Continued on Page 86.

Specifications and Report Card

Unit:	Sinclair ZX80 with 8K ROM
Made By:	Clive Sinclair, UK
Processor:	Z-80
Clock Speed:	not applicable
RAM:	1 Kbyte internal plus 16K option
ROM	8K
I/O	not applicable
Languages:	BASIC
Keyboard:	elastomeric QWERTY with shifted keywords
Display:	24 × 32 black on white
Graphics:	63 ×43 pixels
Peripherals:	printer
Best points	slow but sure; excellent value for money
Worst points:	rotten keyboard if you're a touch typist

Ratings:	**excellent**	**good**	**well, maybe**	**poor**
Documentation	✓			
Ease of Use			✓	
Functionality		✓		
Support			✓	
Value-for-money	✓			

Extras included:	not applicable
Options:	8K ROM; 16K RAM
Price:	$199 — $440 with options
Review unit from:	City Personal Computer, Sydney



If Cheap Is Neat, But It Has To Be Cheap And Neat, Then The MX-80 PRINTER Wins The...

EPSON CUP

The relative prices of printers and computers have resulted in a lot of tail-wagging-the-dog situations in the microcomputer field. Inexpensive printers could be bought, but until recently it was almost impossible to buy cheaply and still get quality printing features. Until the advent of printers like the Epson MX-80; dollar for dollar, it might just be the printer you need. . .

—By Les Bell

ALTHOUGH YOU may have a terminal on your desk and a TV screen to look at what's stored in the memory, there's still no substitued for the written word.

You can fold paper up and take it with you, anytime, anywhere. You can't do that with a computer, not even the smallest of them.

The snag is that, until recently, even fairly shonky printers cost more than a small computer. There are good reasons, both technical and economic, for this. But fortunately times have changed and some good printers are available at a price that won't force you to sell the family's heirlooms, or the computer, to get one.

The subject of this review has generated a lot of interest because of its low cost, large range of features and its small size.

The Epson MX-80 is a general-purpose printer with some features you only expect on much larger devices. It prints bi-directionally, for example, with logical seeking, which means that it doesn't waste time spacing over blanks, but speeds up instead. If the print head moves left to right over a long line and then wants to print a short line immediately after, it will accelerate back to the left before starting printing backwards.

Physically, it's quite a small printer. Only 374 mm wide by 305 mm deep and 107 mm high, it weighs in at 5.5 kilograms. This makes it smaller and lighter than many stereo turntables (and less expensive, too!). It's fairly quiet in operation, and it's styling is quite pleasing on the eye — I'll never forgive Tandy for that awful, futuristic silver and black plastic hi-tech look, which the MX-80 fortunately avoids.

Print quality is very good indeed; in fact, excellent, bearing in mind the price. Full upper and lower case is supported, and the lower case letters such as p and q have true descenders, making the typeface (if you can call it that!) easy to read.

For our French, German and English readers we offer the information that through the setting of two DIP switches, the printer can be set up to print acutes, graves, cedillas, umlauts and even the German B and double-s. (As a matter of interest, do any of our readers know if there is a standard code or extension of ASCII which includes e-acutes, c-cedillas, and so on?).

In addition to the standard and accented character sets, the MX-80 also has a chunky graphics character set which corresponds to that of the TRS-80. In fact, the printer can be set, at the flick of a DIP switch, to be completely compatible withthe TRS-80 character set. Because the print head has 9 pins, the graphics are continuous, with no breaks between the lines.

Of course, if you don't want the graphics characters, at the flick of a switch you can have the Japanese Katakana font instead. Is there no end to the versatility of this machine? Only if you're Russian or Greek, I suppose.

As well as the print characters, the MX-80 will also accept a range of control codes: chief amongst these is CR and LF (carriage return and line feed), and it should be pointed out at this stage that the printer can be set up to perform an automatic line feed after every carriage return, if required, at the flick of yet another DIP switch. (Incidentally, I was fascinated to notice that the DIP switches inside the machine were clearly marked HONDA.) The printer automatically prints the contents of its buffer upon receipt of a CR or LF.

Other control characters: HT causes a horizontal tabulation; tabs are set by the sequence **ESC D** +n1+n2+n3. . . +nk+**NUL,** which allows up to 112 tabs to be set in the one sequence. Vertical tabs can be set by a similar sequence starting **ESC B,** with the vertical tab command being VT, of course. FF makes the printer form feed, and the form length can be set by the sequence **ESC C**+n. The line spacing can be set at 1/8", 7/72", or 1/6" using escape sequences also.

Doing It Differently

The MX-80 can print characters in a double-width format, which is useful for emphasizing points or headings for listings. It confuses some word processors, though, as they lose track of line widths. But used with care, it can be a handy feature.

More important, possibly, is the ability to print condensed characters at 16.5 characters to the inch. This gives a width of 132 characters across — just what's needed for many commercial programs. To set the printer into the mode, just PRINT CHR$(12) on initialisation, and you're away. The print is still good.

These two modes can be combined to give a Condensed Enlarged print, at 66 characters across the page.

As if these modes weren't enough, the MX-80 also offers emphasised characters (done by striking the character twice) and double printing, which strikes the character twice, the second time after advancing the paper 1/216".

By combining these print modes in various ways, it is possible to come up with some striking effects.

The BEL code causes the printer's buzzer to sound for about three seconds — this also happens when the printer is out of paper (and the printer will not accept any data).

The printer can be selected and deselected over the computer interface, and the print buffer can be cleared.

Control Panel

There's a small control panel at the front-left of the printer with three push-buttons and four LEDs. The LEDs indicate power, ready, paper out and on line. The buttons are on line, form feed and line feed. The form feed and line feed buttons have no effect unless the printer is off line.

Interfacing

As standard, the MX-80 is fitted with a Centronics-style 8-bit parallel interface, and most computers can interface to that without any problems. However, for all you people with odd-ball machines, like the PET, TRS-80 and Apple (I was only kidding, honest), Epson has available a range of interface cards. The Apple card plugs into the Apple and matches the Centronics interface. The TRS-80 interface (I think) plugs into the Epson's circuit board, and I'm fairly certain the IEEE 4888 interface fits inside the printer, too. Incidentally, I notice from ads I've seen that Hewlett Packard is now selling the MX-80 with its own name on it to match the HP-85 personal computer — that must be close to the ultimate accolade.

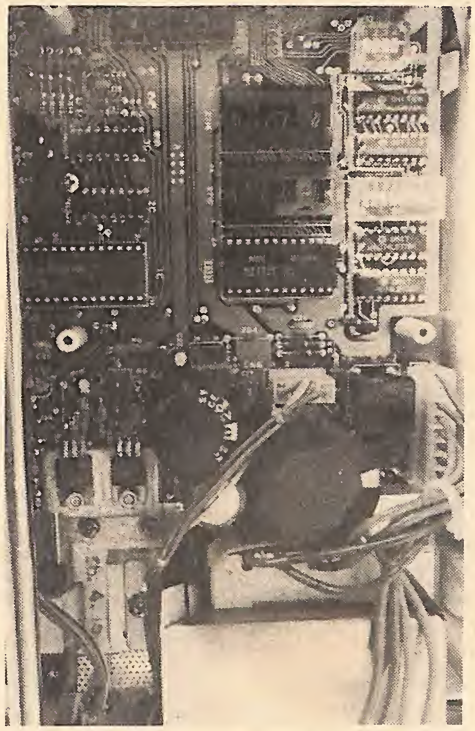
There's also an RS-232C (ahem!) interface board for the MX-80. I say ahem because it's not really RS-232C at all. Well, it's RS-232C from the computer to the printer, but the handshaking back from the printer to the computer is just a straight logic level, which it's pointless to try to feed into a UART. If your RS-232C port has a few bits of parallel I/O for modem control, then you may be able to use one of them to take care of the handshaking, otherwise. . . black marks for that one, Epson!

The Innards

If you're like me, as soon as you've bought some new gadget, the first thing you do with it is rip it to bits to find out how it works. Well, we went through that exercise with the MX-80, and managed to get it back together again (it must be good. . .).

The printer mechanism is simple, and looks robust. There are two stepper

One of the reasons the Epson ZX-80 is able to perform so well. It's well made.



THE EPSON MX80 HAS THESE FACES

CONDENSED:
abcdgkpqxyzABCDKXYZ!"#$%&*><@^~123890

NORMAL:
abcdgkpqxyzABCDKXYZ
!"#$%&*><@^~123890

EMPHASISED:
abcdgkpqxyzABCDKXYZ
!"#$%&*><@^~123890

DOUBLE PRINTED:
abcdgkpqxyzABCDKXYZ
!"#$%&*><@^~123890

ENLARGED/CONDENSED:
abcdgkpqxyzABCDKXYZ
!"#$%&*><@^~123890

ENLARGED:
abcdgkpqxyz
ABCDKXYZ!"#$%&
*><@^~123890

ENLGD/EMPHSD
abcdgkpqxyz
ABCDKXYZ!"#$
%&*><@^~123890

motors, one for the paper advance and one for print head positioning. The latter print head is under control of an 8041 UPI (Universal Peripheral Interface — which is actually a complete microcomputer in its own right). The 8041 is responsible for managing the bidirectional printing and logic seeking functions. The mechanism, reading between the lines in the manual, appears to be a joint venture between Shinshu Seiki (alias Epson) and Seiko, the watch people.

The control circuit board carries very little circuitry. The heart of the beast is an 8049 single-chip microcomputer (2K ROM, 128 bytes RAM inside). This means, with the 8041 UPI, the printer has two microprocessors inside — more than my computer. There's also an 8155 RAM-I/O chip and some EPROM — 2K if I recall correctly — as well as TTL chips. Not much to go wrong.

There's a power supply board, which looks pretty much like a well-designed power supply board should look. Overall, the internals reveal a good quality of construction, equal to some printers which are twice the price or even more.

Documentation

Aha, I hear you say, here's where it all falls down; the manual's written in Japlish, which is all quite amusing until you try to use the printer. *Not so,* the MX-80 manual, while not a shining example of brilliant English, is (tolerably) well written, informative, and well illustrated. I had no trouble at all in finding the information I wanted, and much of it is duplicated, with both quick-reference tables and full explanations in the text. Not a bad effort at all.

. . .And Finally

Value-for-money makes the MX-80 one of the best printers on the market today. I wouldn't be surprised if it was *the* best. If you're looking for a small printer to tack onto the end of a small system, the Epson MX-80 is worth checking out.

And after all that hype, what do we really think of it? Well, Peter deForest (at deForest Software) hasn't seen the review unit since our test, nor will he.

In a radical departure from form we didn't beg, borrow *or* steal the thing; we bought it! □

BEGINNERS

TO PRINT OR NOT TO PRINT; WHAT'S THE QUESTION?

A PRINTER is a printer is a printer. Well, no it isn't. There are bottles of wine and bottles of wine. There are cars and then there are cars.

And there are good printers and there are bad printers.

Thankfully, most of the bad printers are easy enough to be immediately recognised. Some, though, are disguised by a hefty price tag.

But a printer phenomenon is edging itself onto the market — it's the cheap but packed with quality features printer. An example is the Epson MX-80.

A printer increases the versality of a computer system. Sometimes it's nice to take a bit of paper with you and not an entire computer to show someone something; an invoice, for example.

The Epson MX-80 is a high-speed printer, but its cheap price tag belies its quality. You can vary type faces, have bold or italic, big or small letters, a whole range of things usually found only on the more expensive models.

The computer tells the printer what to do, but the printer has built-in an ability to understand what it is the computer is saying — very important. Some computers can't talk to some printers, and vice versa.

The Epson is very easy to set up, very easy to use. It's reliable, fast, doesn't forget itself and comes with some very nifty tricks.

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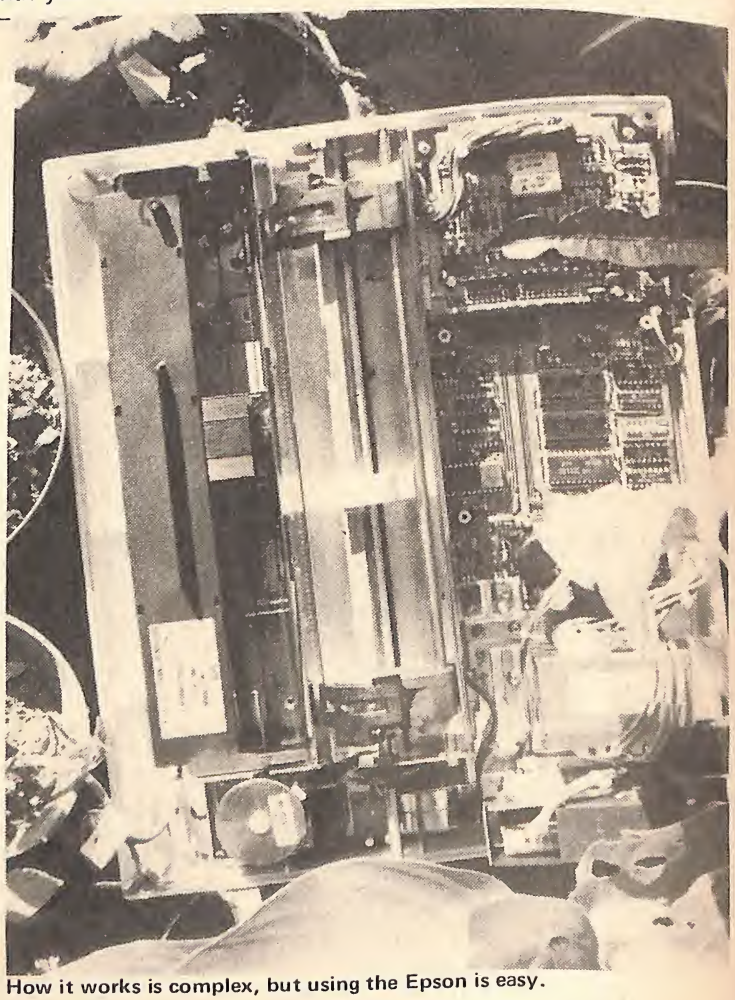


How it works is complex, but using the Epson is easy.

mă'rathon *n.* Long-distance foot--race, esp. as a principal event of modern Olympic Games; feat of endurance; undertaking of long duration. [*M*~ in Greece, scene of decisive battle in 490 B.C., whence messenger ran with news to Athens]

compū'te Reckon, calculate; use comp…r; **cŏmpūtā'tion** *n.*; **~r** *n.*, automatic electronic apparatus for making calculations or controlling operations; **~rize** *v.t.*, perform by, produce by, equip with, **~rizā'tion** *n.* [F or L (*puto* reckon)]

MARATHON

Computers won't help the marathon runner get to the finish line any quicker, but as FRED SYMES reports, he or she will sure know in a hurry where they've finished.

MARATHON RUNNERS and a Commodore 8000 series microcomputer got together recently to provide an ultimate example of antithesis.

The occasion was the 1981 Air New Zealand New South Wales open marathon championship when 580 athletes raced around the 26½-mile course at Holdsworthy military camp.

Okay, marathons aren't all that unusual and you're probably wondering what on earth a sporting event is doing appearing in *Your Computer*. The simple answer is that for the first time in Australia the results were sorted out by computer.

The idea came from Jack Black, a marathon and electronics components whizz. He approached programmer Colin Long to help out.

Now you might think that getting the results of a marathon is pretty simple — you know, 1st, 2nd, 3rd and so on. Not so. Not with this one anyway. Being an open championship, it included a number of categories; 16 in fact.

To collate all the information necessary to find the placegetters in all these categories would normally take about three or four days. The Commodore produced the printouts in a matter of hours, with the all-important (and most complex) age category results being available one hour after the last runner crossed the line.

The program contained a mass of information about each competitor. Such things as sex (yes, women run the marathon, too) age, club name, registered number, fastest previous time, whether they'd run a marathon before or not, among other things. The program also had to allow for late entries up to a few minutes before race start.

As each runner completed the course, in various states of exhaustion, his or her registered number and elapsed time was recorded by officials. Within minutes this information was being fed in to the computer to be sorted into the relevant categories.

Each entry took only a few seconds, in fact the operation could have been speeded up considerably had the program been in machine rather than BASIC language. However, with only three weeks to write the program in spare time (mostly late at night) BASIC was the only way possible to finish it on time.

Surprisingly, says Colin Long, the software worked perfectly.

"We were expecting a few bugs but when we wrapped up the job four hours after the race nothing appeared to have gone wrong," he said.

Oh, yes, that antithesis bit.

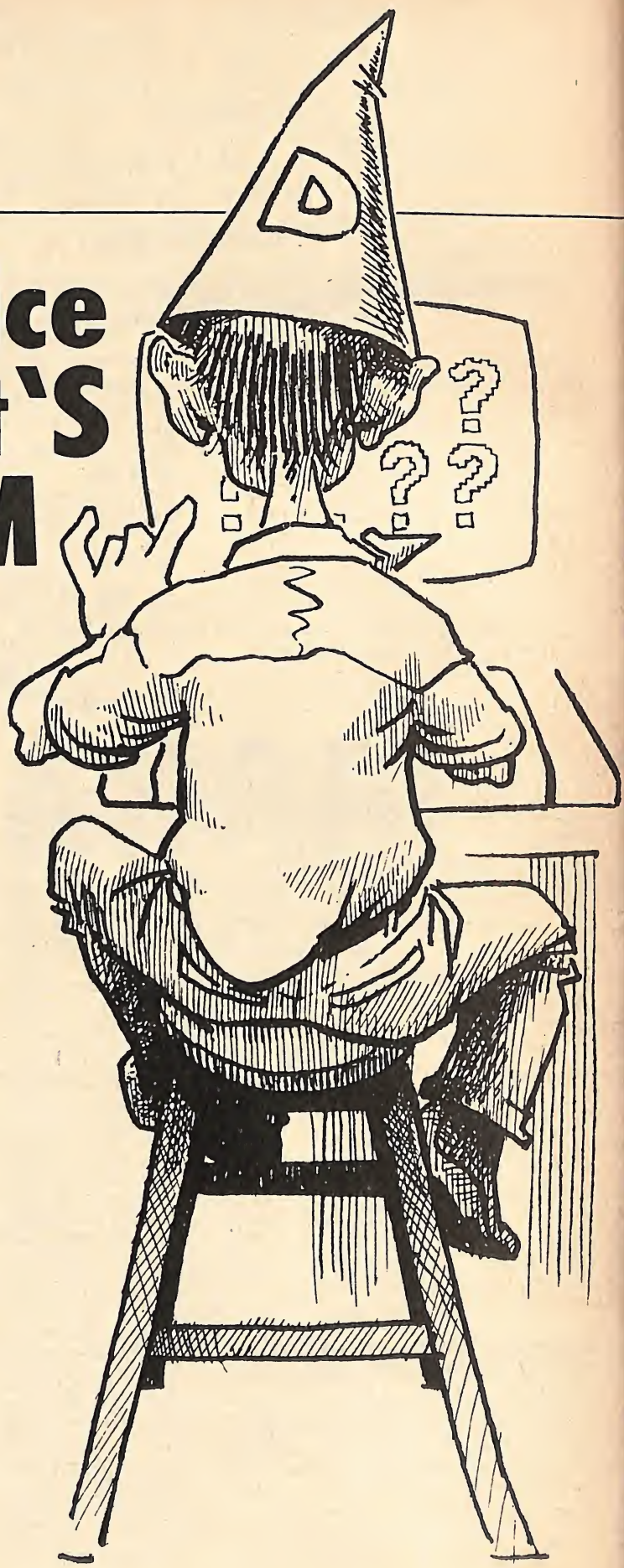
Anyone out there who still thinks of the computer as a brain should watch a marathon runner in action, particularly one who finishes well back in the field. While the computer operates in a series of totally logical steps, the runner must call on every bit of abstract, illogical thought to keep himself going.

I mean where is the logic in the self-punishment of slogging around, mile after mile, hour after hour, knowing you have no earthly chance of winning? But perhaps this shows the intelligence which will always outwit the computer and maintain its subservience to the human race.

For the record, the NSW open marathon championship was won by Steve Poulton in 2hr 17m 07s. □

ThE ofFice idlot'S flrST TerM RepOrt caRd

For persistence	A
For tenacity	B+
For ability	C–
For showing us all that for every step forward, there can be two back	A+



NAPOLEON HAD trouble, didn't he? I mean, at first he had his successes, but he also had his Waterloo. . .

He's not exactly my hero, but the comparison between Napoleon's battles with brass monkeys and the Russians and mine with brain fatigue and computers is just too close to ignore.

Napoleon's feeling around in his tunic was, I'm convinced, in the hope of finding a hammer so he could wallop the ice off his hat. I feel around inside my shirt in the hope of finding a heart beat. After battling with the complexities of BASIC and machine language (and never winning) rigor mortis has a habit of calling for lunch.

The other day (a journalistic term which could mean anything from last year to yesterday) I was, unhappily, confronted by the son of Sinclair's ZX80. Son, as you can read in the review in this issue, is a hybrid of that remarkable and devilish ZX80, the one with the miniscule memory and mighty ability. My run-ins with this machine are legion.

My first encounter with the ZX80 ended, as you doubtless know, in humiliating defeat. My Lady who works with massive IBMs all day, heaped scorn on me as well.

With son of ZX80, you buy a new chip which gives the lad a bigger built-in memory, and a pack which give him 16 times the ability to store information. Because he can do so much more, you also get a new keyboard overlay.

I had, eventually, won the battle with the original machine. The new one, I so carelessly thought, would be dead easy. Hah!

Carefully, on that horrible night the other day, I pulled the old ZX80 apart, put in the new chip (or so I thought), carefully laid down the new keyboard overlay, put the covers back on, plugged into the back the new big-memory pack and did the following things, in this order:

- Plugged in the power pack — 240 volts, I'm told, melts ZX80s. Nine volts doesn't.
- Plugged the video cable into the machine, and then to the family colour TV, to get a fairly clear and understandable picture (use channel 1, for all you hopefuls out there).
- Pressed the Newline key and did not end up with a letter K, the cursor, as I should have. Instead, the computer gave me a question mark. . .
- Rang the computer world's version of Lifeline, the editor. You idiot, he said, and explained he had already put the new chip in! Did I think he was stupid enough to leave that to me?
- I pulled the thing down again, put the right chip back in and I haven't looked back since. Mind you, I do look over my shoulder now and again. The editor is getting a bit upset over my 'phone calls. He has a decidedly strange look in his eye whenever he sees me.I put it down to eye strain, but you can never be too sure.

Do you ever feel, despite your own feelings of self-confidence and the knowledge you're not really off the air, that in certain crowds or situations your contribution to enlightenment and personal enrichment hovers between outright failure and humble lunacy?

Unfortunately, that's what happens to me whenever, A: I get within extension-cord range of a computer; and B: When I walk into the office each day.

I've proved this point time and time again. Take my dabblings with Tandy's TRS-80 Model 111 (the version with built-in twin disk drives) as a prime example.

In its huge carton it looked harmless, except for the notice which said: CAUTION: Do Not Drop As CRT May IMPLODE.

Carefully, I pulled the TRS-80 Model III out, placed it on my desk, plugged the office cassette recorder to the beast, worried for five minutes because the cassette recorder power cord would not go in the TRS-80's power outlet, then realised the real power cord was at my feet, leapt to the keyboard. . . and came to a sudden stop.

I had trouble getting Dick Smith's System 80 to work, but eventually (with a lot of help) sorted it out.

With Sinclair's ZX80 and son of ZX80 I had my moments, but emerged victorious.

With the APF Imagination Machine I had no trouble whatsoever.

With the Tandy TRS-80 Model III. . . Oh my gawd, where do I begin to tell you its inpenetrable nature for the beginner, of which I am, according to others at the office, the beginners' beginner?

Doubtless the TRS-80 has many remarkable features. A few I heard about, but could not understand, surpassed that of the ubiquitous Apple. For example, loading a program from a cassette tape to a disk is apparently a much easier and quicker exercise with the TRS-80 than with the Apple.

However, that was really not my concern. I looked at the three, huge manuals which came with the TRS-80 and tried to find a sensible sequence of instructions. I couldn't find them. After being used to the ZX80 BASIC Programming manual, the simplicity of the APF Imagination machine, and the logical sequence of events with the Apple, I made very heavy weather of my time with the TRS-80.

Can you imagine the frustration a beginner would feel after being told the understandable instructions he needs to use the disk drives, as an example plucked out of the air, are embedded in a disk?

If a beginner hoped to find step by step instructions in the manuals to get himself or herself used to the various operations and languages of the machine, before moving on to bigger, more complex and complicated matters, then forget it. The instructions in the manual have every appearance of being easy. . . but they aren't.

I somehow loaded a demonstration disk, and the information on the disk ran. Miracle of miracles.

But don't ask me how I did it. I haven't the faintest idea.

Because I'm a raw recruit, I look at microcomputers in almost simplistic terms. I think all beginners do. I told myself that if I could write simple BASIC programs for the ZX80, run programs on the system 80 and Apple and APF without too much bother, then I should be able to do the same with the TRS-80. I, sob, couldn't. And I still, sob, can't.

The fault is in the documentation. The main problem is that Tandy assumes you only buy the disk drive model after you have experience with the basic: an unreasonable assumption in the case of the Model III which, simply because it has room for them, encourages you to buy the on-board drives first up.

Les Bell, the pretentious know-all, sat down at the TRS-80 for the first time and went off and running immediately. I hate him. □

BEGINNERS

Continued from page 79

If the ZX80 was a cunning piece of technology, and if its miniscule size was no indication of its abilities, and if its dirt-cheap price floored you, then what are you going to think of a ZX80 that is even smarter.

SON OF GODZILLA

LIKE SON of Godzilla, the son of Sinclair's ZX80 is the image of his dad, but with a bit more muscle and a few more brains.

The original ZX80 (reviewed in our first issue) was an incredibly clever machine for its size and mental capacity. Its human equivalent would have been a five-year-old genius.

Son of ZX80 — not to be confused too much with the next generation on the family tree, the ZX81 — was sent to prep school, given a heavy session in the gym and graduated with the good looks of its father, a much bigger memory and a new ego.

While dad had a mental capacity of just a Kilobyte (1K) (a byte provides storage for one character in the computer's memory, so 1K is about the length of your average nasty letter. See, it wasn't hard, was it?) sonny, remember him? son of ZX80, has 16Ks of memory, or 16 times dad's nasty-letter capacity.

The extra brain power does make dad look a bit of an idiot.

Dad's ego was pretty sound, but like all good children sonny usurped the parent and came up with a bigger and better version — in his case an 8K ROM, (Read-Only Memory, the machine's permanent memory which contains the information the ZX80 needs to work); which is twice the size of the original.

This is all child-psychology talk to say that son does more thinking for himself, while dad needs a bit of a hand now and again.

The ZX80 is small. If you left it lying around a sandwich shop long enough, it would be mistaken for a piece of lumpy bread and sold with a bit of corned beef and mustard. Son of ZX80 is a bit heavier hung and doesn't risk the same fate.

In fact, the gestation period for sonny boy is about five minutes. To set the record straight, you can't get son without dad. So, beginning with dad, you take of the lid, and remove the old boy's ego (the original permanent memory, the piece of electronic wizardry called the ROM chip) and replace it with a more powerful version.

Before the lid goes back down, an overlay is put down over the original keyboard (to cut down costs drastically, the ZX80 keyboard is touch sensitive and has no moving parts). The new overlay is needed because son of ZX80 does things a bit differently to dad, and different keys have different, new uses.

Next, you put the lid back on (but check first that the computer works with the new chip and overlay) and clip into the back sonny's new 16K memory pack, a black plastic box that gives sonny the ability to out-think dad in a flash.

You then have the pride of the Sinclair family in your hand: a complete son of ZX80.

Its computing abilities are significantly better than dear old dad's. The manual which comes with sonny is also a big improvement, even though dad's was very, very good.

The chapters take you on a BASIC programming course (BASIC is the language you talk to the computer in) which introduces you very capably to the power and abilities of your new charge.

In the beginning, the book involves you in using the son of ZX80 as a calculator. The big difference over dad is that son has a floating decimal point; no, not a teenage disease, it just means that son can play around with fractions, while dad used to stagger around with whole numbers.

Then it takes you on the twisted path of graphics programming, making pretty pictures appear on the screen. It's a most necessary part of the course if you're to later instruct the ZX80 update to run a horse race, complete with horses running on the screen.

There are far more keyboard functions in sonny boy's keys that give it its specialised instructions, and without which it would be just a dead bit of plastic and printed circuit board.

There are far more keyboard functions in sonny boy's keys, which give it its specialised instructions, and without which it would be just a dead bit of plastic and printed circuit board.

There is a fast button that makes son about four times quicker than dad, but you do lose the TV screen while son takes time to think. On the slow button, everything remains clear and pristine, and stationary.

Son of ZX80 is a powerful little computer; as a machine in its own right, it offers very good value for money. As a teaching tool, or an experimenter's toy, for someone who doesn't want to go to too much expense (yet), it is excellent value for money.

Son of ZX80 is a plug-in 16K memory module the size of a cigarette packet and an 8K ROM chip half the size of a domino, all neatly clipped on to dad. You could quite happily frighten off Godzilla with it.

Son of Godzilla is another matter. □

your computer text file

Fishing Expedition

I BOUGHT a copy of *Your Computer* after having anticipated its arrival for nearly two months.

Congratulations, a great publication.

Please don't go the way of the other journal which I hardly bother to read anymore. Its only concession to the home dabbler is just an oft-repeated glossary of terms.

Placing myself (at a guess) at an 'intermediate' level of understanding of the home computer, I am interested in both elementary and advanced fields but on the human and practical side, not the theoretical.

Now that you have even dared to mention the APF Imagination Machine IM-1, don't let it drop — please. I couldn't get the other mag to even include it in its market surveys. I appreciate that you too must be swayed by numbers, but I do hope to see a Your APF Computer section amongst the Apples and 80s.

I am a family man, 27, by trade a map maker and have worked around computers for 10 years. I had no programming experience until I bought a HP 25c calculator. I loved it!

I got the IM-1 last November, about the first one in Adelaide, and hoed in. Why the APF you ask? After much careful consideration of my limited money supply, I believed the IM-1 to represent the best value at that level. I still believe it. There is at present a lack of informed technical backup in this country, although the users' club in New York is excellent in recognising overseas members (would you believe that it is called the Your Life Will Never Be the Same Computer Club)? Mercifully it uses the acronym YLWNBS Club).

I continue to be impressed with the capabilities I discover within this computer, which neither the advertising nor the manuals even hint at. Yes, I would buy the same again, and I do recommend it to home enthusiasts, the more so if they have family to consider.

DAVE POWELL
Morphett Vale, SA

Words In The Night. . .

I AM WRITING to complain about the instructions for the completion of section 1 in the APF computer contest.

The instructions give no idea of the number of words needed in section 1 — should there be 12 (the number of blanks) or as many as you can create? Also, section 6 in the rules is confusing as it states "after examination of all answers to question 1. . ." Does this mean every entry is checked or just the odd few? And what will be examined? Finally, how would a tie arise.

W.W.CRANDALL JR.
Double Bay, NSW

The competition is a word game. It wasn't designed to be hard, but it wasn't meant to be easy, either. If you read very carefully what the instructions say, taking absolutely nothing for granted, you'll discover there is only one way to do it.

Yes, every entry is checked, and we look for those entries that got it right. Obviously, there has to be a winner, but more than one person can get the combination of words. In that case it's a tie, and its then that the other factors are considered.

Ed.

WE WELCOME readers' letters. Not only do we enjoy reading them (most of the time. . .), we want to publish them so other people can look in on your news and views.

Constructive criticism, lavish praise for our efforts, helpful hints for other micro users; if there is something you would like to say, write to *Your Computer* at PO Box 216, Spit Junction, NSW 2088.

Saucy News

THANK YOU for an excellent first issue. I was glad to read local content for a change.

However, The best news is that *Your Computer* actually mentioned my favourite, the HP-85. Please, give us more!

ERIC WAKEFIELD
Dee Why, NSW.

Fan Mail

I ESPECIALLY enjoyed the articles about the Office Idiot's trials and tribulations. My experience with computers is similar to his.

At present, I am a very interested onlooker who would like to become more involved, but I am terrified of getting my fingers burnt yet again. My previous experiences with electronic 'gear' have persuaded me to be very wary and now I find myself surrounded by all these different systems and no-one seems prepared to give a totally honest run-down on what his computer can and cannot do.

I have spent a fair amount of time in the shops and the salesmen are all sure that they have just what I need — maybe I do not know the right questions. What this all amounts to is that I am still unsure of which system to buy and, for this reason, I hope you continue your reviews of the computers available with the frankness of the reviews in your first edition.

I am clear on what I would like from a personal computer: It should challenge my reasoning ability; it must be educational and to this end it should be able to produce large, high resolution words for my child to read and to progress from there to more complex learning programs, and my wife would like to be able to use it to help in managing the home. I also appreciate the games.

I do not see this as being any more than a hobbist would want, but I have not already made my choice and I feel that this choice will become more difficult as more equipment appears on the market.

I am relying on you, so keep the information coming.

STEVE McNALLY
Boolaroo, NSW.

Sticks And Stones

AT LAST, a good magazine for us beginners. Out here in the sticks, it's not easy to get your hands on *any* kind of computer magazine, let alone one as good as yours — but don't you guys know better than to put your cut-outs on the back of something that could be interesting (good thing I read it first)?

Please put your order forms and such on the back of some dreary old ad so that if we need to mutilate the magazine, at least we wont miss something important.

I am a student and am trying to study computing by correspondence (not easy, I might add, especially when I get my brightest ideas at 2 am and have no computer to try them out on). Anyway, to help with my homework, I went and purchased a ZX80, and was pleased to read your article on the Mighty Mite (after I had spent my money). It's nice to know my money isn't wasted. I started out a bit like your office idiot, buy now have the beast under control, almost.

I still can't get my space invaders out of the cassette every time. But I fluked it once or twice (patience, girl, patience!).

Can you maybe print a few helpful hints about these problems from time to time?

Thanks to whoever was responsible for printing this magazine, and keep it up!

JENNY STORM,
Cootamundra, NSW

your computer pocket programs

An AddA For Dadda

YOU MAY not spend your evenings bashing your head on the loungeroom wall because no-one will give you a pocket program to work out palindromic numbers, but. . .

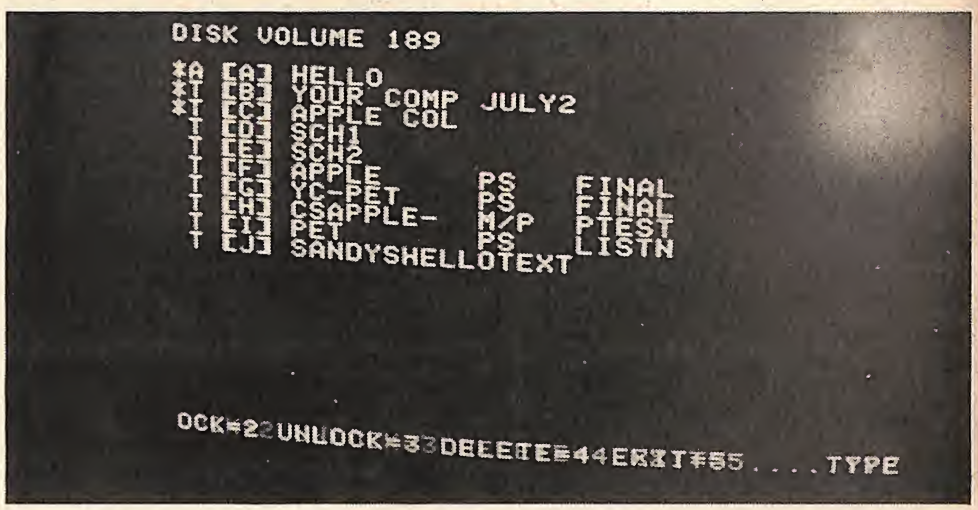
For TRS-80 Level I and II owners, put away the Bex; Frank Mack, from the Grafton High School, NSW, has your evenings sewn up.

"Basically, it involves taking any number, reversing the digits and adding; then repeating the process until such time as the sum is palindromic," he says.

We'd like to add that the result of running the program gives a print-out that's about three times longer than the program itself.

According to Mr Mack, the school uses palindromic numbers to keep the kids occupied while helping them with their addition skills.

Still don't know what a palindromic number is? Well, a palindrome is a word, like Anna, that's the same backwards as it is frontwards. . .




```
 5 CLS
 8 DEFDBL A-Z
 10 PRINT@015,"******   PALINDROMIC  NUMBERS   ******"
 20 PRINT:PRINT:
 30 INPUT"ENTER ANY NUMBER.    THIS PROGRAMME WILL GENERATE  A PALINDROMIC NUMBER FROM YOUR NUMBER";C#
 35 Q=C
 36 N=0
 37 CLS
 40 PRINT:PRINT:
 45 PRINTQ
 50 X=C
 60 N=N+1
 70 B=C-INT(C/10)*10
 80 C=INT(C/10)
 90 GOSUB1000
 100 PRINTI:Y=X+I
 112 T=I-X:IFT=0THENGOTO200
 115 PRINT"--------------";"         ";"*  ";N;" STEP(S)"
 120 GOSUB2000
 145 I=0:C=Y
 147 PRINTY
 150 GOTO50
 200 PRINT:PRINT
 210 PRINT X;"  IS A PALINDROMIC  NUMBER GENERATED FROM ";Q;"IN";N-1;"STEPS"
 220 C=0:X=0:B=0
 225 T=0:I=0:Y=0
 230 GOTO20
 1000 I=I*10+B
 1010 IF C=0THEN1030
 1020 GOTO70
 1030 Y=Y+1
 1040 RETURN
 2000 T=I-X
 2010 IF T=0THEN200
 2020 RETURN
```

```
DISK VOLUME 254

 *A [A] HELLO
 *B [B] INVADERS
 *A [C] WUMPUS
 *A [D] BRICKOUT
 *A [E] WUMPUS2
 *B [F] ADVENTURE
  B [G] AREC
  B [H] AREC
 *B [I] FRED




UNLOCK=3 DELETE=4 EXIT=5      TYPE LETTE
```

Far left ar Applesoft progr... a boon to the Apple owner who can't tell his disk-drives from a file number.

Apple 'Ullo

```
RUN
******   PALINDROMIC  NUMBERS   ******
 1946
 6491
--------------        *   1  STEP(S)
 8437
 7348
--------------        *   2  STEP(S)
 15785
 58751
--------------        *   3  STEP(S)
 74536
 63547
--------------        *   4  STEP(S)
 138083
 380831
--------------        *   5  STEP(S)
 518914
 419815
--------------        *   6  STEP(S)
 938729
 927839
--------------        *   7  STEP(S)
 1866568
 8656681
--------------        *   8  STEP(S)
 10523249
 94232501
--------------        *   9  STEP(S)
 104755750
 57557401
--------------        *   10  STEP(S)
 162313151
 151313261
--------------        *   11  STEP(S)
 313626412
 214626313
--------------        *   12  STEP(S)
 528252725
 527252825
--------------        *   13  STEP(S)
 1055505550
 555055501
--------------        *   14  STEP(S)
 1610561051
 1501650161
--------------        *   15  STEP(S)
 3112211212
 2121122113
--------------        *   16  STEP(S)
 5233333325
 5233333325
 5233333325   IS A PALINDROMIC  NUMBER
GENERATED FROM  1946 IN 16 STEPS
```

THIS APPLESOFT program should prove useful for readers who run disk drive-equipped Apples.

It's been around for some time and, as is always the case with this sort of utility, has been modified several times — so even if you're running it already you might find this one's an improvement.

This version, as modified by *Your Computer's* new (next issue) Apple columnist Greg Stringer, turned up on a contributed disk and we thought it was too good to hide.

Key the program into your Apple and save it onto a loaded disk, then run it to get an idea of its value: you'll probably then decide to use it as it was intended, as a disk initialisation program.

It catalogues the disk, then labels each file alphabetically, and flashes a scrolling message across the bottom of the screen offering you six options.

You can simply type the relevant letter to run a program, or type numbers for other effects: 1 for load, 2 for lock, 3 for unlock, 4 for delete and 5 for exiting this program.

If you use it as the Hello it runs as soon as you boot your disk, so with autostart ROM machines you can have a program loaded and running by simply typing a letter after switch-on.

It distinguishes between machine code and BASIC programs, so is capable of BLOADing and BRUNing where necessary.

You can, naturally, add its features to your current disks by saving it under the same filename as your current initialisation program.

```
100  TEXT:HOME: D$=CHR$(4): PRINT
     D$"CATALOG": B=PEEK(37)-2: IF B>22
     THEN B = 22
110  T=0: CH=4: FOR CV=0 TO 23: GOSUB
     1000: IF C<>160 THEN POKE P-1,219:
     POKE P,T+193: POKE P+1,221: T=T+1:
     S=CV
120  NEXT CV: VTAB 24: A$="TYPE LETTER TO
     RUN, OR LOAD=1 LOCK=2 UNLOCK=3
     DELETE=4 EXIT=5..."
130  B$="RUN": HTAB 1: PRINT
     LEFT$(A$,39);:
     A$=MID$(A$,2)+LEFT$(A$,1):
     K=PEEK(-16384): IF K<128 THEN FOR K=1
     TO 75: NEXTK: K=FRE (0): GOTO 130
140  POKE-16368,0: K=K-176: IF K<1 OR K>5
     THEN 300
200  HTAB 1: CALL-868: IF K=5 THEN  END
210  PRINT "PRESS 'LETTER' YOU WISH TO ";:
     IF K=1 THEN B$="LOAD"
220  IF K=2 THEN B$="LOCK"
230  IF K=3 THEN B$="UNLOCK"
240  IF K=4 THEN B$="DELETE": FLASH
250  PRINT B$;: CALL-198: NORMAL: SET
     K$:K=ASC(K$)-48
300  IF K<17 OR K>T+16 THEN 130
310  CH=1: CV=S-T+K-16: GOSUB 1000: IF
     C=194 AND (B$="RUN" OR B$="LOAD")
     THEN B$="B" + B$
320  FOR CH=6 TO 39: GOSUB 1000:
     B$=B$+CHR$(C): NEXT CH: HTAB 1:
     CALL-868: PRINT B$: PRINT D$;B$: GOTO
     100
1000 C1=INT(CV/8): C2=CV-C1*8:
     P=1024+128*C2+40*C1+CH: C=PEEK(P):
     RETURN
```

HEARD ON THE BUS

By LEON YENDOR

showdown at the OK corral...

Standard media or mediocre standards? After having been told about hardware standards in the first issue, you might have thought yourself sufficiently prepared to go computing.

Not so easy! There are media problems to consider.

THOSE OF us who were around long, long ago will remember the early cassette interfaces and how we found that we couldn't always swap tapes with each other. We weren't using the same recording techinque as everyone else, but then, to ease our pain, along came Kansas City Standard Tape Format.

A meeting of designers in that famous place resolved their differences and laid down a recording method which ensured that tapes were readable by nearly every user. Considering that these guys worked for a number of manufacturers this was remarkable in itself, but there was still one problem. Even though I could read your tape could I make any use of it? Maybe those guys were so happy to get that far that they went out and celebrated too much to be able to finish the job. Nobody could tell from the tape itself if the file was text or program, where in memory it should load and if any error checking method was used. Sure the smarter manufacturers implemented various data layouts that achieved these determinations, but the key word here is various. No wonder you don't hear much of old KC now. I guess it doesn't matter any more because only the poor beginner has to put up with tapes and a TRS-80 program isn't much good to an Apple muncher anyway.

Slipped Disks

If you have decided that floppy disks are your salvation, you can do something to ensure a greater degree of media exchangability. But all is not rosy in this area either, so we should note just how widely our chosen "standard" ports vary if we want access to many programs. First, let us look at physical details. There are two sizes of floppy in wide use. The minifloppy is five and a quarter inches in diameter and the floppy is eight inches. Yes, I know we are all metric now but the sizes are determined in the good old US of A and these are the figures you'll mostly see in the literature.

My chart of disk types lists the following minis:

- Single sided; soft sectored; 10 hole; 16 hole.
- Double sided; soft sectored; 10 hole; 16 hole.

Both types are available in single and double density. Double-sided double-density disks are often referred to as "quad density" — pooh! What are those twits going to say when Lal Tandon really redoubles the density later this year?

As mentioned in my first column, there is no IBM standard for minis, so if you hear this description applied to a mini file, the speaker is either an idiot or a con man, depending on whether he's a user or salesman. This information may become invalid if the rumoured IBM minifloppy eventuates. In any case various formats are used on the soft sectored disks, some have 35 tracks and some 40, with the 96 tpi units sporting 70, 77 or 80 tracks. On each track you may find varying numbers of sectors — 10, 16 and 18 are numbers I have seen.

So minis are a problem and floppies aint? More sad news! There are four types of hard sectored diskette, all with 32 holes! You will be pleased to hear that, apart from Burroughs B-80 systems, these are getting rarer — so let's just look at the IBM standards; 370 and System 34 are the magic numbers here. These use soft sectored disks and here you will find the single-sided single-density 128-bytes-per-sector, 26 sectors, 77 track diskette that is the nearest thing to a universal standard in media.

Leaving aside for now all the other formats, let's see where this IBM standard gets us. Physically, the layout of sectors on these disks is just how IBM set it down. But just try reading the disk I wrote this on in a 3740. The problem is what we put where.

The big guys don't boot their systems from a floppy nor use them for program storage. They are laid out for data only and big chunks of it at that. What we do is to reserve the first two (usually) tracks for the system and the rest for data, which is accessed after referring to a directory. Only if all systems which need to read this disk know where the directory is and how it is coded will they be able to use the files. Just getting a disk which was formatted by IBM doesn't mean the info on it is *getable*. Fortunately, nearly every CP/M system which uses 8 inch floppies has the capability to read the original layout used by Gary Kildall for distribution. As a result, this has become the most widely used interchange format and is the nearest thing to a real media standard for micros.

If I wanted to ensure that I had access to the widest possible program and data bases, I'd make sure that I had a machine which could read and make sense of an 8 inch floppy in single-density single-sided 128-byte sector format when written with the data and directory laid out as explained in the CP/M method. I don't know of any program that runs in the CP/M operating system which is not available in this type of disk.

What all this boils down to is that there is no universally used layout for mass storage. You have to ensure that you are not buying an orphan. It is a little like choosing a video cassette recorder.

Please make sure you know how many other sources you have for programs before you buy a disk unit or computer. Make sure, too, that these sources don't depend on one hardware manufacturer. I think it wise to choose equipment and operating software that is effectively standardised and thereby insulate yourself from the possible demise of any one source.

Crystal Balls

Dangerous things! But it's my neck I'm sticking out so here goes. The famous Bell Lab's UNIX will be the most copied operating system of the eighties. Early look-alikes will have to have a CP/M interface if they are to succeed on eight bitters. Who wants to give up that good software base? C (also originating at Bell) will become a big force in micro software development. I've heard this described as "Pascal that isn't afraid to get its hands dirty" A good thing that is too. Someone like me can't stand all the overblown praise for that hothouse orchid escapee from the halls of academia.

BASIC was designed as a teaching too language (and all you who came up that way should thank Kemeny and Kurz for that) but all the useful versions are non-standard little (or big) half-sisters □

PROBABLY THE hardest thing for the new user of CP/M is coming to terms with the documentation. Unfortunately the manuals seem to be written for someone who works at Digital Research and already understands something about CP/M. This situation is being relieved by the appearance of several books about CP/M from independent (of Digital Research) sources. There is a brief review of one such book later in the column.

Some Extra SYSGEN Features

There are several features of some of the CP/M support utilities available on almost all CP/M systems which are not documented in the Digital Research manuals at all. The first is for the SYSGEN, COM program supplied with all CP/M systems (except the Apple Softcard CP/M). SYSGEN.COM is used for transfering CP/M systems from disk to disk and also in writing newly generated systems to the disk.

The DR suggested method for writing a new system to disk using SYSGEN is to get the system into memory using DDT (or SID) then exit DDT and use SYSGEN. In this case you are supposed to ignore the prompt about the source drive and press 'return', then answer the prompt about which destination drive you want to write the new system onto. There is an alternative way to achieve this: SYSGEN is given a file name when it is executed (for example A SYSGEN CPM48.COM) it will not prompt for the source disk but go straight to the destination disk prompt. The file named in the command line is loaded into the appropriate position in memory ready for writing onto the system tracks of the destination disk.

The file name given to SYSGEN must be a valid CP/M system image generated from MOVCPM as outlined in the System Alteration Guide.

SYSGEN can also be used for examining the system image on the system tracks of a diskette. SYSGEN is executed as normal and the source disk prompt is answered for the disk whose system you want to examine. When the destination prompt appears just press 'return'; CP/M should then warm-boot. Before executing any other command type: A save ×× CPMSYS.COM where ×× is the number that your particular MOVCPM prompts you to use when you save a system image created by it. This CPMSYS.COM file can now be examined, patched and altered in exactly the same way as a system image created from MOVCPM, and then written back onto a disk using the method outlined earlier.

An Extra DDT Feature

As well as the DDT (Dynamic Debugging Tool) supplied with every CP/M system, DR also markets a more advanced debugger called SID (Symbolic Instruction Debugger). One feature of SID is a hexadecimal arithmetic command 'H'; the 'H' command is also in DDT but it is not mentioned in the DDT manual, it is however mentioned in the System alteration guide (on 7 of my copy). If while in DDT you type: —H2800, 1800 DDT will respond with —4000 1000 (for example):

2800H + 1800H = 4000H (the sum)
2800H + 1800H = 1000H (the difference)

This hexadecimal arithmetic feature can be very handy in calculating address offsets, buffer lengths and so on.

New Versions of CP/M and MP/M

Over the next few months DR will release new versions of CP/M (version 3.0) and MP/M (version 2.0). Full details are not available at the time of going to press but some features of the new versions will include file/record locking, User 0 public to all other users, passwords, as well as support for time and date, type-ahead buffer and video console cursor movement commands.

A CRT screen version of ED is also to be included in these new versions. To support all these new features the system image will become approximately 2K bytes larger and I think that this could create problems for many users. With most double density implementations of CP/M 2.2 there is not enough room on the system tracks of the disks to support a system 2K larger than CP/M 2.2.

Don't go bothering your dealer for more details just yet as he probably doesn't have them. My guess is that it will probably be July before MP/M 2.0 is released and late August before we see CP/M 3.0

Book Review

The CP/M Handbook with MP/M by Rodney Zaks is the first of several recent publications designed to make CP/M understandable for new users. Unfortunately this book will probably confuse as many new users as it will help as there are numerous major and minor errors. While there is a reasonable coverage of the basics of CP/M there is nowhere near enough information about the pitfalls of customising the BIOS or the practical differences between the preconfigured CP/M systems supplied with many computers.

For instance, while every system is supplied with a SYSGEN utility and each functions identically as far as the users are concerned, SYSGEN is a highly system-dependent utility program which must be customised for every different disk controller. Similarly not all CP/M systems images are the same size; double density implementations are often larger than single density versions. Once again this is usually not noticeable to the user but can lead to confusion if material presented in 'The CP/M Handbook' is followed.

The book is poorly bound and many pages came loose in my copy. I get the impression that this is another of the Zaks 'pulp mill' paperbacks designed to make a quick buck out of the microcomputer market. Don't buy it, there are better books around on CP/M (to be reviewed later).

UNIX-like Operating System

As I've mentioned before, I think that UNIX is the coming thing in microprocessor operating systems. I recently had the chance to use a preliminary evaluation version of MARC (Machine Aided Resources Co-ordinator), a UNIX-like operating system being developed by Ed Ziemba in the US. Those of you who are using BDS C will remember the cryptic references to MARC in the BDS manual.

In a word MARC is impressive, even in its present rudimentary state. Its commands are largely the same as UNIX with pipes, filters, I/O redirection and many of the other features of the UNIX shell. Perhaps the most impressive thing about MARC was the ease with which it was installed on my system. The system is presently on two disks. The first disk is called the 'Parasitic Boot' and is a CP/M disk. You simply type MARC and MARC proceeds to locate your CP/M BIOS and relocates itself to use the BIOS. It then prompts you to insert the other MARC disk and finishes loading MARC.

Finally someone has worked out a way to latch another operating system onto almost any CP/M 2. X BIOS, no matter what type of disk system is being used. Mini-floppies, double density or hard disks, it doesn't seem to matter as MARC will work with them all. This is the way UCSD PASCAL *should* have been done, instead of the complicated bootstrapping procedure it uses. MARC will probably be released in the US around August/September and will include a copy of BDS C as well as a lot of system utilities.

80-AT Address

In last month's column I gave the wrong address for 80-AT, the Australian 8080/Z-80 User's Group. The correct address is P.O. Box 165, Lakemba, NSW 2195. □

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Win an **apf** Home Computer

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COMMODORE is offering for a limited period the 4016 16K pet for $999 (you also need the C2N cassette for $126). How limited this will be only time will tell.

Commodore machines have been overpriced in this country for some time. The current offer makes it quite competitive.

One of the things I cannot fathom about Commodore is the price structure of its products.

In the United States the price of the 8032 varies from $US1500 to $US1800; in Australia it is $2750, 50 per cent higher (whilst the Australian dollar is worth $US 1.14 our 15 per cent sales tax offsets this).

I know there are shipping costs, import duty, and the need for local product support. However the recommended retail price of an Apple II in the US is $1550 compared to $1720 here, a difference of only 10 per cent.

The interesting point is that Apple is distributed here by an independent company.

Then again, as reported in our last issue, Commodore made a profit on its first three months of operation here even after writing off all setting-up costs.

In case you or Commodore feel I am being unfair in picking out the 8032 as an example, the 4032 is up approximately 65 per cent.

One further point on costs: the Federal Government has increased the duty on computer imports by 200 per cent. However sources in Commodore are not sure whether they will be affected and if so by how much.

The Colour Commodore

The price of the new Commodore Video Interface Computerwhich is expected to be released in Australia around September, is rumoured to be $399 or so, a fair figure on the current US price plus the need to modify it to suit the PAL television system.

The VIC (which stands for Video Interface Chip) is a 5K home computer. It comes standard with an RF modulator so that it can be directly connected to your television set. Features will include:

- Programmable function keys
- Programmable sound generator
- Full-size keyboard
- Memory expansion to 32K
- High-res graphics, joystick, light-pen
- External plug-in program cartridges.

It will compete directly with the Atari 400 (although the Atari has 8K of RAM it uses 3K for internal operations, leaving only five available to the user).

The VIC will be adapted for use to the PAL colour system before it is marketed in Australia, a definite plus point as distinct from the APF machine which requires an NTSC set. It will also use PET basic.

I expect to be able to bring you a pre-release report soon, as Commodore will be receiving evaluation machines shortly.

According to reports the VIC is not yet released in the States as it is still awaiting FCC approval.

The VIC to be released in Australia will be the European version which, I am told, is already in production in Germany.

This should mean that supplies will be readily available here by October.

When the VIC is released it will be supported by a new range of peripherals such as a single serial-ported disk drive. At the same time or very close to it Commodore is planning to have the single drive for the PET available.

Sound Generation Routines

As promised in the last issue I have included some routines to generate sound on your Commodore.

To generate a sound like a police klaxon try the following:

```
10 POKE 59467,16:POKE 59466,2:REM
     PREPARES CB2 FOR USE
20 FOR X = 1 TO 4
30 FOR Y = 100 TO 255 STEP 40
40 POKE 59464,Y:NEXT:
    FOR B = 1 TO 475:NEXT
50 FOR Y = 255 TO 100 STEP -40
60 POKE 59464,Y:NEXT:
    FOR B = 1 TO 475:NEXT
70 NEXT
```

To generate specific notes poke the following values into location 59464:

A = 69
B = 61
C = 117
D = 105
E = 93
F = 87
G = 78

Fast Forward Tape Loader

This program, which was developed by Stephen Lee of Commodore, was originally published in the Sydney Users Club magazine.

It allows for the fast-forward searching of the tape. It requires, however, that it be used to save the programs as blocks are set up so that they are each larger than any program that may be loaded into them (if it is less that 8K).

If you wish to use this program, load it as the first program on each tape. By changing the contents of FL$(X) to reflect the program name you will have an accurate directory of all your tapes.

It its printed form it is suitable for old—ROM PETS.

For new ROMS and BASIC 4 alter the value 519 to 249 in lines 70, 530 and 550. □

—Peter Sandys

```
3 DIMFL$(14)
11 FL$(1)="PROGRAM 1"
12 FL$(2)="PROGRAM 2"
13 FL$(3)="PROGRAM 3"
14 FL$(4)="PROGRAM 4"
15 FL$(5)="PROGRAM 5"
16 FL$(6)="PROGRAM 6"
17 FL$(7)="PROGRAM 7"
18 FL$(8)="PROGRAM 8"
19 FL$(9)="PROGRAM 9"
20 FL$(10)="PROGRAM 10"
21 FL$(11)="PROGRAM 11"
22 FL$(12)="PROGRAM 12"
40 PC=5.073E-2 REM
50 FFT=98:REM
60 PRINT"□■■■PRESS STOP ON TAPE #1"
70 IF PEEK(519)<>0GOTO70
110 GOSUB170
130 GOSUB190
140 GOSUB430
150 GOSUB480
160 END
170 REM CLEAR THE SCREEN
180 PRINT"□";:RETURN
190 PRINT"          ** DIRECTORY **"
191 PRINT"
200 FORQ=1TO40:PRINT"_";:NEXT
205 PRINT"|          |
210 PRINT"| FILE     |       DESCRIPTION
220 FORQ=1TO40:PRINT"¯";:NEXT
225 PRINT"|          |
226 PRINT"L    -     ⊥ DIRECTORY "
230 FORQ=1TO12:PRINT"L    ";CHR$(Q+64);"
    ⊥  "; FL$(Q):NEXT
235 PRINT"|          |
240 FORQ=1TO40:PRINT"¯";:NEXT
300 PRINT"■■WHICH FILE DO YOU WANT ?"
400 GETC$:IFC$=""THEN400
410 IFC$<"A"ORC$>"L"THEN400
420 BS=ASC(C$)-64:F1=BS:RETURN
430 REM
440 BS=BS*8000
450 FT=.11594E1+.13985E-2*BS-.61234E-8*BS↑2+
    .24540E-13*BS↑3-2.5562
460 FT=FT*FFT/98*19.7134*PC
470 RETURN
480 REM
490 PRINT"□■■■■SEARCHING FOR FIELD   ";C$
492 PRINT"NAMED              ",FL$(F1)
496 PRINT"■■■■■PRESS FAST FORWARD ON TAPE #1"
500 IFPEEK(59411)<>53GOTO500
510 FT=TI+FT*60
520 IFTI<FTGOTO520
530 POKE519,52:POKE59411,61
540 PRINT"□■■■■■■PRESS STOP ON TAPE #1"
550 IFPEEK(519)<>0GOTO550
560 PRINT"□■■■TAPE IS NOW IN CORRECT POSITION"
570 PRINT"■■YOU CAN NOW LOAD OR SAVE THE
    PROGRAM■■■■■"
590 RETURN
READY.
```

FLEXING THE BEASTY'S MUSCLES WITH A DISK DRIVE — BUT WHICH ONE?

THE EDITOR, in his wisdom, demanded I tell you some more about my Sorcerer computer.

As I said in the first Sorcerer column, I first used this microcomputer as a word processer, but found I was not using all the features of the WP pack. So I took a deep breath, evicted the moths from my wallet and decided that I would buy a disk drive.

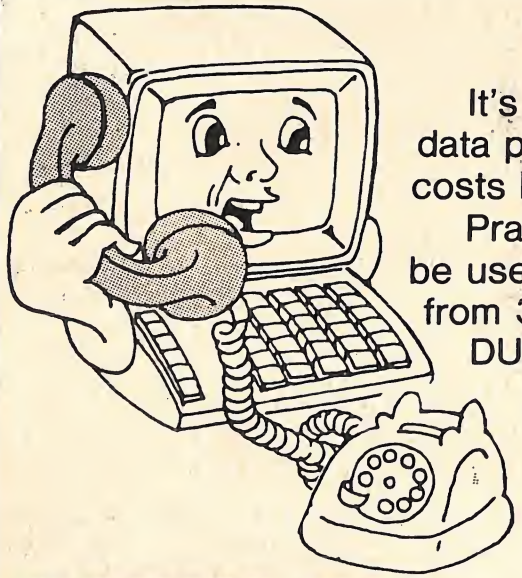
With most machines there is no real choice of drives for you to add to your computer (nice play on words there). But with Sorcerer there are no less than three disk drive systems to choose from — Exidy's own FDS (floppy disk system), the Vista disk drive and the Micropolis disk drives.

I'll try and lay out a few facts about each of the disk drives, and the reason I bought the one I did.

The newest on the market is the Vista disk drive. It comes in several configurations, starting at a 200K single disk. For about $1000 the Vista includes a CP/M disk operating system and the choice of two different versions of disk BASIC. This looked like good value, but when I was shopping for a disk drive Vista had not been released. No-one could tell me if I could save the files from the word processer pack using the version of CP/M that came with the Vista drives. Perhaps now that they are available someone will be able to answer this question.

The Exidy FDS is another relative newcomer to the market. Like the Vista system it uses soft sectored disks (there is only one timing hole in the disk. A hard sector disk has 16). The FDS has a capacity of 308K a disk and with the three possible disk drives this gives a capacity of 924K of on-line storage. The first disk (the

one with the controlling card) comes with a CP/M operating system for $1190; if you want a disk BASIC you will have to buy it separately for about $350. But there is a bonus — the disk BASIC includes a routine to automatically convert most standard Sorcerer BASIC programs to



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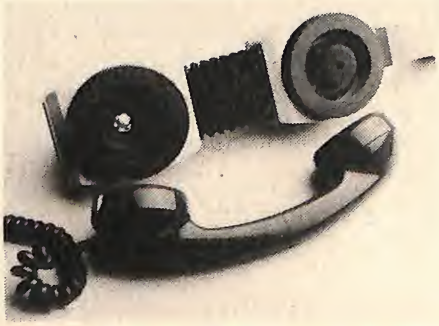

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disk BASIC. There is no great problem about what to do with all the programs you have already written.

Finally there was the Micrcpolis disk drive. Unlike the other two disk-drive systems, the Micropolis used an S100 disk controller card; to use this drive you must also have an S100 expansion bus (which costs $575).

The Microplois has a capacity of 315K a disk and you can have up to four drives a controller. This means 1.2 million bytes of on-line storage. The first drive, complete with controller, MDOS (the Micropolis Disk Operating System), and a disk BASIC costs $1149. The add-on disk drives (which can be used with the FDS) cost $649. You can buy a CP/M operating system to suit the Micropolis for around $149. A CP/M complete with a disk BASIC like the one mentioned for the Exidy FDS costs about $445.

I chose the Micropolis disk system for one reason: flexibility. I added disks to my Sorcerer to make it easier to use the features that were already there and to add new utilities. With the Micropolis disks I had a choice of two systems, two disk BASICS and five empty S100 sockets in the expansion unit, sockets that I can fill with music synthesisers, analogue to digital converters, AC power controllers or any of the large range of S100 boards around. That's about as flexible as I want a microcomuter to be.

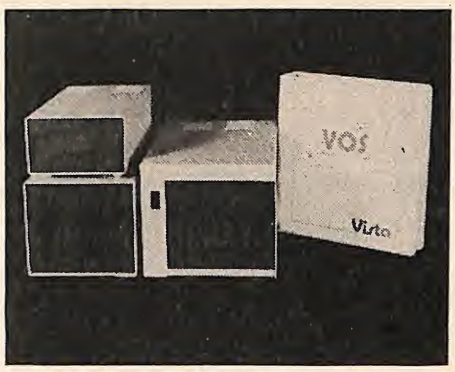
Next issue, I'll move away from the hardware side and look at three software packages: Quality Software's graphic animation package, a utility package that gives great results, Arlington Software's Music Program that allows you to enter a tune in standard musical notation onto the screen, and then play it through an external amplifier, and System Softwares machine language tutorial package, an instruction program to introduce you to the strange world of machine language programming. □

—Paul Beaver

New Scenes

THE VISTA, which Paul mentioned as being attractive but unavailable when he was searching for a disk drive, is indeed alive, well and thriving in a retail atmosphere.

The Vista system needs no expensive



S100 buses; it plugs directly into the Sorcerer's 50 pin edge connector. The amount of user storage for each disk side is 189Ks. It bumps up to a maximum of about 800K for a dual-drive double-density disk system.

Software supplied with the system includes:

ASM	— loads and executes the CP/M assembler.
BASIC	— BASIC-E language.
COPY	— copies, formats and performs a read check of full disk.
D	— displays files on disk (alphabetically) and blocks used.
DDT	— for testing and debugging programs.
DUMP	— shows in HEX contents of a particular file.
ED	— context editor allowing creation and alteration of ASCII files.
EXBIOS	— Basic input/output system.
EXYCPM	— reconfigures CP/M for a particular memory size.
INIT	— will initialize blank or crashed disks in Vista format.
LOAD	— translates HEX files into COM types.
PIP	— peripheral interchange program.
RUN	— interpreter for files created by BASIC-E.
STAT	— gives memory information about programs and device
SUBMIT	— allows commands to be batched together for automatic processing.
SYSGEN	— generates CP/M on an initialized diskette.
VERIFY	— checks copied disk.

CP/M commands:

ERA	— erase file or files.
DIR	— lists files on logged disk.
REN	— renames files.
SAVE	— saves files.
TYPE	— shows contents of ASCII source file.

Media: System diskette with above software and box of 10 blank diskettes.

Documentation: take a week off work to read it.

Don Weir from Customised Technology in Sydney is running the dual drive double headers (B52s) and finds the system reliable and simple to use.

To load programs is easy, he tells us:

BASIC:

```
CLOAD PROGN
READY
BYE
>DU 187 188 - find program's end, e.g:
>46 25      - end is 2546
>60 B900    - (or whatever boot you
              have; must be below
              BFFF to avoid ROMPAC
A>SAVE zz PROGN.COM
          - where zz is the number
            of pages (38 in example)
```

The BASIC program is now on disk and can be called by just typing it's name and, when on Ready, typing run.

Machine Code Programs

Where GO ADDRS is 100H and start ADDRS is equal to or greater than 100H: LO PROGN

When loaded, boot system and SAVE zz PROGN.COM or if on drive other than A; SAVE zz B:PROGN.COM will save on drive B where GO ADDRS is greater than 100H, eg: 1000H

Once the software is loaded, add a jump:

EN100
C3 00 10 /

now boot the system.

The above examples will now load and auto-execute when called from your diskette.

The Vista system is good value and there is software available off the shelf.

RATHER THAN go into the workings of the Apple II this month, I would like to evaluate a superb program that has just been released — one which could do as much to promote the micro as Visicalc has.

The program, produced by Image Producers Inc, is so new I have not yet seen a review of it in the US magazines.

It requires an Apple II Plus with 48K and a disk drive (3.2 or 3.3).

Called Time Manager, it is a computerised diary with a difference.

The speed of the program is one of its real plus points.

To move from day to day takes only a split-second, and the same for monthly searches. Time Manager also remembers the current date so by issuing a single command the program will return to the current day, or any other day you have designated as your base day.

As a diary it permits you to create both an automatic reminder and a permanent history file.

It provides a complete list of each day's activities in a priority order. As each item is completed you delete it or add it to your permanent record. Things you have planned to do but didn't have time for are then automatically scheduled the next day.

In other words, if you don't delete something it will be carried forward — the number of times I have forgotten to do this in my own diary is embarrasing.

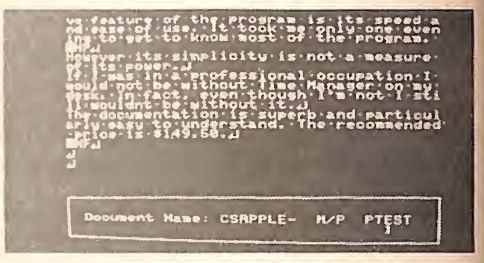
It has automatic search for an entry: how many times have you wanted to find reference to something you are sure you had done but somehow couldn't find, especially when a client wants the information now. Time Manager allows you to search for a specified field or word like electricity account, or golf score.

It incorporates expense documentation and account records. The program lets you specify amounts and categorise them. You can have up to nine separate accounts and you can also break up the entries in each of the categories with a client name or maybe a job number — for example, telephone costs for job 123 or for Mr Brown. This feature could be invaluable for people who have to keep detailed records of costs for final breakdown and charging to their clients. A lawyer or advertising executive are two examples which come to mind.

If your Apple is fitted with a hardware clock Time Manager displays the time and date. It can also be set to remind you of an appointment by a buzzer signal.

In addition to the data display Time Manager can also give you a hard copy for any day of the year. This helps if you are going to be away from your computer, or you need it for other work during the day.

For tax records Time Manager is invaluable. You can use the expense record function to itemise your expenses and detail why the expense was incurred.



You can have your expense totals on a daily, weekly, monthly or yearly basis.

With data search, you can specify a company, name, project or the like and the program will display those entries containing your selected word.

You can also set permanent dates in your diary from year to year, covering items like public holidays or your wedding anniversary. Time Manager sets these up each year on your data disk without you having to remember to do it.

As I indicated earlier, the most impressive feature of the program is its speed and ease of use. It took me only one evening to get to know most of the program. However its simplicity is not a measure of its power.

If I was in a professional occupation I would not be without Time Manager on my desk. In fact, even though I'm not I still wouldn't be without it.

The documentation is superb and particularly easy to understand. The recommended price is $149.50. □

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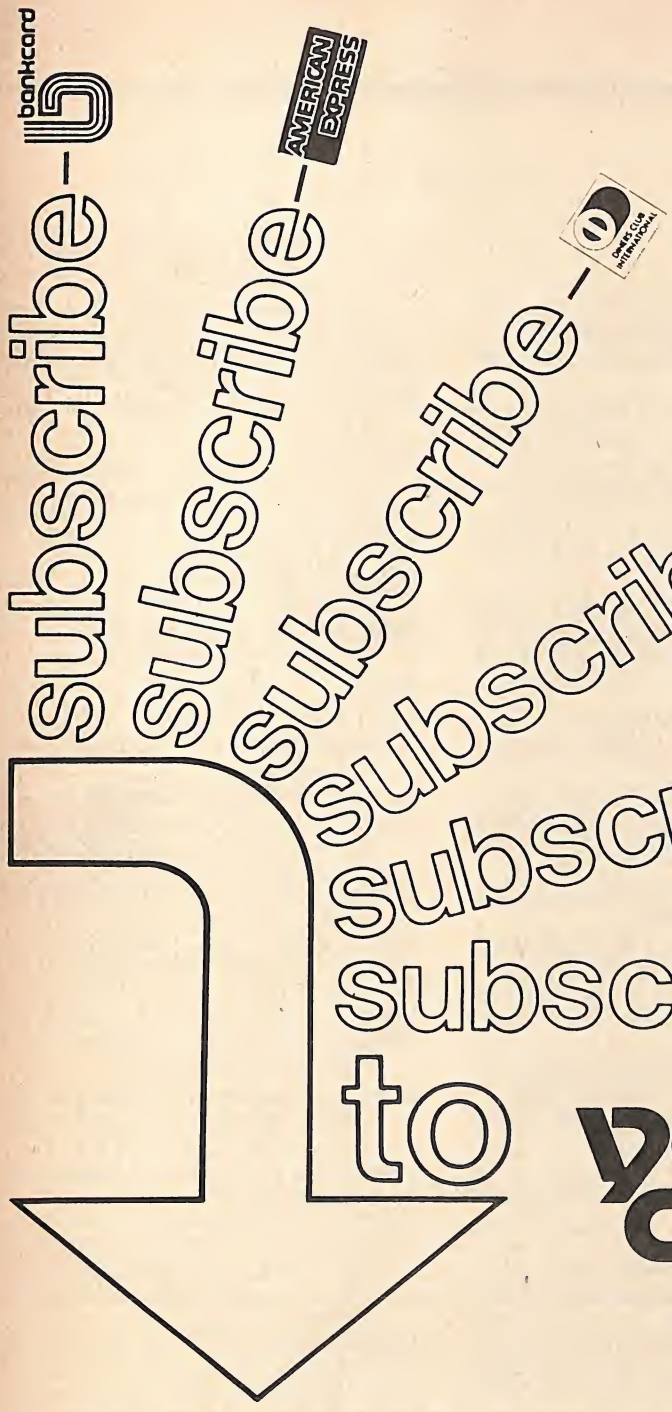

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your computer glossary

Absolute: Located at a fixed address in memory.
Access: To read or write from a location in memory, or a file, or disk.
Accumulator: The major register of a CPU.
Address: A memory location.
Algol: Algorithmic Language.
Algorithm: A set of instructions which define a method of obtaining some result.
Alphanumeric: Composed of either letters or numbers or both.
Apple: The Apple 11 computer is a computer based on the 6502 microprocessor with an integrated keyboard.
Application: What you do with your computer.
Array: A set of values under a common variable name, which are accessed through a subscript.
ASM: Assembler.
Assembler: A program which converts assembly language into its corresponding machine (or object) code, which can be executed by the computer.
Assign: To make one thing equal to another.
Atom: An indivisible component of a data structure.
Attribute: A property possessed by some object, such as a file.Often attributes take the form of restrictions, such as a file being read-only.
Backup: An extra copy of a disk, tape or file taken as a precaution against damage of the original.
Backus Normal form: A special language (a metalanguage) used to describe precisely the grammatical rules of another language.
Base: The lowest number inexpressible in a given number system.
BASIC: Beginners All-purpose Symbolic Instruction Code.
BDOS: Basic Disk Operating System. The major functional component of the CP/M DOS.
Binary: The system of counting in 1s and 0s used by all digital computers.
Binary Search: A method of searching for an entry in a table by successively halving the table until all that's left is the desired entry.
BIOS: Basic Input/Output System.
Bit: Binary Digit. Either 1 or 0.
Boot: To load the operating system into the computer from a disk or tape, either initially or subsequently after running a program.
Bootstrap: To use one short program to load a longer loader program which then loads the operating system.
Buffer: An area of memory used for temporary storage while transferring data to or from a peripheral such as a printer or a disk drive.
Bug: an error in a program.
Bus: A set of wires over which, data, addresses, or control signals are transferred between the central processor and memory or I/O devices.
Byte: A computer word eight bits wide. A byte in memory can hold a character or a binary number between zero and 255 (or — 128 and 127), or a computer instruction.
C: A programming language, developed at Bell Labs.
Call: A jump to a subroutine which leaves the return address on the microprocessor stack, so that when the subroutine is finished executing, control returns to where it left off.
CBASIC: A commercial version of the BASIC language, running under the CP/M operating system.
CCP: Console Command Processor. The part of the CP/M operating system that reads a command line and sorts out what it means.
Chain: To automatically run one program after another.
Character: A letter or number, or in some circumstances, a control code such as "carriage return".
Checksum: A running total of the characters in a file, recorded or transmitted with the file so that errors can be detected.
Code:
Cold Boot: To start up a system from scratch.
Cold Start: See Cold Boot.
COM file: In CP/M parlance a command file.
Command: An instruction from the console.
Comment: A note added into a program to help the reader (or programmer) to understand its operation.
Compiler: A program which accepts as input a source file written in a high level language, and produces as output an object file containing the machine instructions which are actually executed.
Concatenate: To join two strings together, one after the other.
Conditional: A test.
Console: The keyboard and screen.
Control characters: Codes which perform functions.
Copy: To duplicate, usually for backup safety.
CP/M: A disk operating system for 8080 and Z80 based microcomputers.
CRT: Cathode Ray Tube.
Data: Information to be processed by, or output from, a program.
DDT: Dynamic Debug Tool. A program that assists the user to find errors in machine code programs.
Debug: To locate and fix errors.
Directory: A list of the programs on a disk (or occasionally tape).
Disc: A flat, circular magnetic surface on which the computer can store and retrieve data and programs.
Disk drive: The mechanical assembly which rotates the disk and positions the read/-write head.
Disk Operating System: A program which operates one or more disk drives automatically and mangages the system.
Display: The computer's output device at the console, usually a TV-like display of letters and numbers.
Double Density: A method of recording twice as much information on a floppy disk.
Dump: To list out the contents of memory or a disk.
Echo: When the computer inputs a character from the keyboard, it then sends it back to the display so that you can see it was received correctly.
ED: An editor program; part of CP/M.
Editor: A program which lets you alter and correct source files and other documents.
Error Message: Tells you something went wrong, and sometimes what.
Execute: To run a program.
FIFO: First in, first out.
File: A continuous collection of characters (or bytes) saved on a disk or tape for later reloading.
Fixed Point: Counting in integers only.
Flag: A variable, sometimes a single bit, which can have only two values, used to indicate some condition.
Floating point: The kind of arithmetic used in scientific calculators.
Floppy disk: A disk, made of thin flexible mylar, and enclosed in a card jacket, which can be used for magnetic storage.
Focal: Formula Calculator. A simple language.
FORTRAN: Formula Translation. One of the first computer languages.
Garbage Collection: The process of going through memory or disk space, reclaiming all the unused space.
Global: A variable which is known to all the parts of a program.
Grammar: The formal rules of a language.
Hard Disk: A disk made of hard material, larger, faster and more fragile than a floppy disk, and capable of storing 70 million bytes or more.
Hexadecimal: The method of counting to the base sixteen.
Identifier: A label, or the name of a variable.
Index: A variable which usually points to an entry in a table or list.
Index Register: A processor register which is used to access tables and lists in memory.
Indirect Addressing: Referring to a variable which actually contains the address of another variable.
Input: To get data into the computer.
Instruction: A step the computer can perform.
Integer: A whole number.
Intermediate Code: A special kind of object code which cannot be run directly on the computer, but must be interpreted.
Interpreter: A program which examines source code a line at a time, decides what it means, and then does it.
Interrupt: To electronically drag the computer away from what it is doing in order to respond to some time-critical situation.
I/O: Input/Output.

Kilobyte: 1024 bytes (Kbyte).
Kilobaud: 1000 baud (kbaud).
Label: A word which identifies the destination of a call or jump instruction, or simply identifies some location in memory.
Line Number: A number at the beginning of a line, which identifies it in a similar way to a label.
Link: Part of a data item in a list, which tells the computer the location of the next data item.
LISP: A list processing language, much favoured by the artificial intelligence community.
Load: To transfer some data or program into the computer memory.
Locate: To "fix" a relocatable code so that it will only run if loaded in a particular location.
Logical Device: A device as the computer "sees" it.
Loop: To repeatedly execute a sequence of instructions.
Machine Language: The binary codes the machine actually executes.
Macro: A user-defined sequence of instructions which can be inserted anywhere in a program.
Macroassembler: An assembler which can utilise macros.
MBASIC: Microsoft BASIC; the BASIC used in the TRS-80, PET, Apple 11 and so on.
Memory: Where the computer stores data and programs internally for fast acccess.
Menu: A display which offers the operator a choice of several alternatives.
Microprocessor: The central processing unit of a computer, built into a single silicon chip.
Mini-diskette: A 5¼ inch floppy disk.
MP/M: A multi-user version of CP/M.
Numerical analysis: The art and science of number crunching.
Object Code: Machine code.
Object File: A file containing object code.
Object Module: An object file containing part of a program, ready to be linked to others.
Octal: the system of counting to base eight, or grouping bits in threes.
Offset: To load an object file somewhere it will not run, in order to edit or modify it.
Open: To give the operating system the characteristics of a file so that it can subsequently read or write it.
Operand: The number an operator (+, −, etc) operates on.
Operator: An arithmetic function or some other function which alters variables.
Output: What the systems produces.
Packed Data: Data which shares the same address, and has to be unpacked before use.
Page: A length of memory, typically 256 bytes.
Parameter: A constant which sometimes has to be varied.
Parity: An extra bit on the end of a character or byte for error detection.
Pascal: A modern structured language which may eventually rival BASIC in popularity.
Password: A secret word the system may demand.
Patch: A temporary (ha,ha) fix on a bug.
Peripheral: A piece of equipment the computer uses.
Peripheral Driver: A program which outputs data to a peripheral and controls it.
PIP: Peripheral Interchange Program. A CP/M utility for copying files between devices.
PL.1: Programming Language /1.
Pointer: A variable used for indirect addressing.
Polish Notation: A method of separating operators and operands; e.g. + 5 4 is Polish Notation for 4 + 5.
Preprocessor: A program which does part of a job to make life easier for the program which follows.
Priority: The resolution of which interrupt is serviced first if two should arrive at the same time.
Program: A sequence of instructions which can be understood, and ultimately followed, by a computer.
Prompt: A message asking the operator to supply information.
Queue: A list in which entries are made at one end, and removed from the other.
R/O: Read Only; cannot be overwritten.
RAM: Random Access Memory.
Random Access Memory: The computer's internal memory which is used to hold running programs and data. The computer can both write and read RAM.
Read Only Memory: Memory used to store programs, which can not be erased or overwritten.
Read/Write Head: The small coil which reads and writes on the surface of a disk.
Reconfigure: To reorganise the I/O or other aspects of a system.
Record: A set of related data items. For example, an employee's name, address, payroll number and pay rate would form a record.
Recursion: The ability of functions in some languages to call themselves.
Redundant: Not needed or taken for granted.
Reentrant Code: Code which can be used by several programs simultaneously, keeping separate data for each.
Register: A location in the processor capable of performing logical or arithmetic functions on the contents.
Relocatable: Capable of being moved in memory.
Relocatable Object Module: Part of a larger program consisting of many such modules, all linked together and located.
Resident: Permanently in the system.
Reverse Polish Notation: See Postfix.
RPN: See Reverse Polish Notation.
Run: To execute a program.
Save: To store a program on disk or cassette.
Schedule: To decide at what stage a process should run (of an operating system).
Sector: A section of data on a disk.
Simulation: Making one system behave like another.
Software: Programs.
Source Code: The original text form of a program.
Source File: A file of source code.
Source Language: The language the source code is written in.
Sort: To arrange items of data in order.
Spool: To output a file to a peripheral.
Stack: A list in which both entries and removals are made at the same end.**String:** A sequence of characters.
Submit: To put the system under control of a file of system commands.
Subroutine: Part of a program which can be accessed from several points within the program.
Symbol: The name of a variable or a location in memory.
Symbol Table: A table constructed by an assembler or compiler to give the addresses of all variables and labels in a program.
Symbolic Name: A label.
System: A collection of hardware and software, possessed of the property that the whole is greater than the sum of the parts.
System disk: A disk carrying the operating system.
Teletype: An electromechanical printer/keyboard.
Timeshare: Running several programs on a system simultaneously.
Track: The area under the read/write head during one rotation of a disk.
Transfer: To move data.
Transient: A program that is only in memory for a short time before being overwritten.
Tree: A list in which each data item may refer to several others.
TTY: See Teletype.
Unix: A multi-user, multi-tasking, multi-programming operating system, expected to appear on microcomputers before long.
User: One of the people connected to the computer.
Utility: A program of use to most users.
Variable: Named quantity that can take on different values.
Verify: To check that data written on a disk or tape can be read again correctly.
Warm boot: To reload the operating system a second or subsequent time.
Word: The amount of data fetched from one memory location. Typically one byte.
Word Processor: A system for manipulating, editing, printing and formatting texts files.
WordStar: A proprietary word processing program.
Write Protect: To remove the cover from the notch in a floppy disk so that it cannot be written on.
Zilog: Manufacturer of the Z-80 and Z8000 microprocessors.

your computer services

EDITORIAL CONTRIBUTIONS: Contributions to *Your Computer* are welcomed and will be given every consideration*. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details).

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your computer club news

WE KNEW you were out there; some of you even wrote to us to let us in on what was happening in your club. . .

But there a a lot of you keeping yourselves beautifully hidden. If you want your club listed or we've put down the wrong address or made some other blunder, the only way these errors and omissions can be cured is for you to write to us. Let us know in a letter addressed to *The Club Page, Your Computer, PO Box 216, Spit Junction, NSW 2088.*

Besides addresses, we would also like information on what your club is doing. He who hesitates doesn't get published.

Our club list for this issue has been updated; you'll notice new addresses for the NSW Apple Users Group, the Apple Society of Melbourne (help us out with *full* details there, please!) and the Australian 80AT-Z80 Users Group. □

NEW SOUTH WALES

MEGS (Microcomputer Enthusiasts Group); John Whitlock, PO Box 3, St Leonards 2065. Meets third Monday each month, Wireless Institute Australia Hall, 14 Atchinson Street, St Leonards. 7 p.m.

NSW Apple Users Group; John Smith, 1A Wallaroy Road, Double Bay 2028. Phone (02) 36 5696 for more information.

Commodore Users Group; John Guidice, GPO Box 4721, Sydney 2001.

Compucolour Users Group; Andrew MacIntosh, 91 Regent Street, Chippendale, Sydney 2008

80-AT, The Australian 8080-Z80 Users Group; PO Box 165, Lakemba 2195

Wollongong Computer Club; Paul Janson, 14 Hoyward Street, Kanahooka 2530, or 'phone (042) 61 5451

Sorcerers Users Group; PO Box E162, St James, 2001. Ian King, 15 Forest Avenue, Wahroonga 2076, or 'Phone (02) 48 6072

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Sorcerer Computer Users (Australia); Secretary, PO Box 144, Doncaster 3108

Compucolour Users Group; L. Ferguson, 12 Morphett Avenue, Ascot, Melbourne 3342

SMUG; SCORD M100 users, Robin Miller, 60 Winmalee Drive, Glen Waverley 3150

National ZX80 Users Club; 24 Peel Street, Collingwood, Victoria, 3066

Apple Users Society of Melbourne; contact Mr G. Halprin, 'phone (03) 859 5835 (sorry, that's all we've got at the moment).

BUG 80; Burwood Users Group, PO Box 46 Blackburn South 3130.

Geelong Computer Club; Peter McKeon, PO Box 93, Geelong 3220

SOUTH AUSTRALIA

TRS-80 Users Group; G. Stevenson, 36 Sturt Street, Adelaide 5000

QUEENSLAND

Brisbane Youth Computer Group; A. Harrison, PO Box 396, Sunnybank 4109.

AUSTRALIAN CAPITAL TERRITORY

MICSIG' Registrar, PO Box 446, Canberra 2601.

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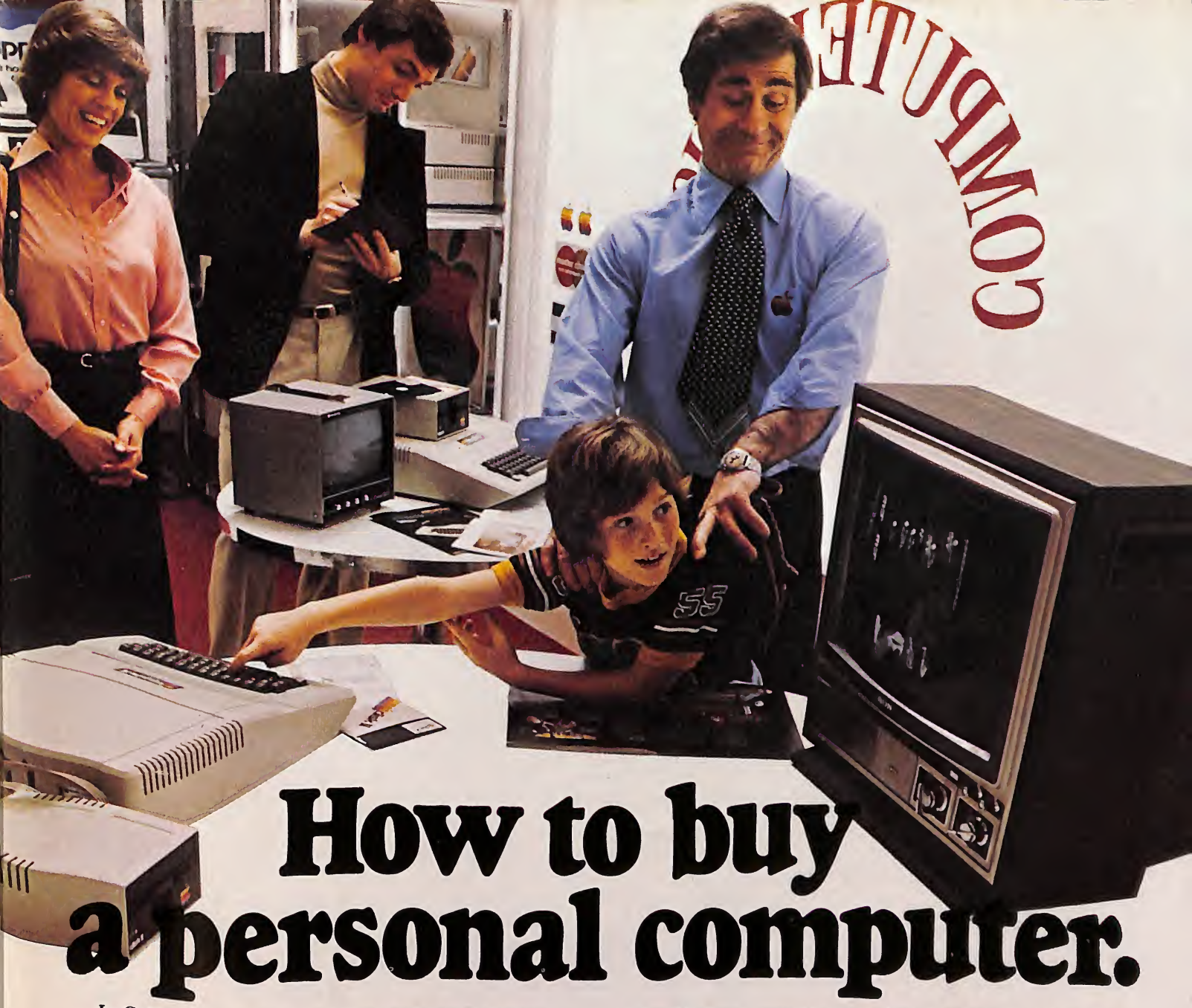

How to buy a personal computer.

In California, a store owner charts sales on his Apple Computer. On weekends though, he totes Apple home to help plan family finances with his wife. And for the kids to explore the new world of personal computers.

A hobbyist in Michigan starts a local Apple Computer Club, to challenge other members to computer games of skill and to trade programs.

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Visit your local computer store

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What to look for

Your local computer store has several different brands to show you. So the salesman can recommend the one that best meets your needs. Chances are, it will be an Apple Computer. Apple is the one you can program yourself. So there's no limit to the things you can do. Most important, Apple's the one with more expansion capability. That means a lot. Because the more you use your Apple, the more uses you'll discover. So your best bet is a personal computer that can grow with you as your skill and involvement grow. Apple's the one.

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