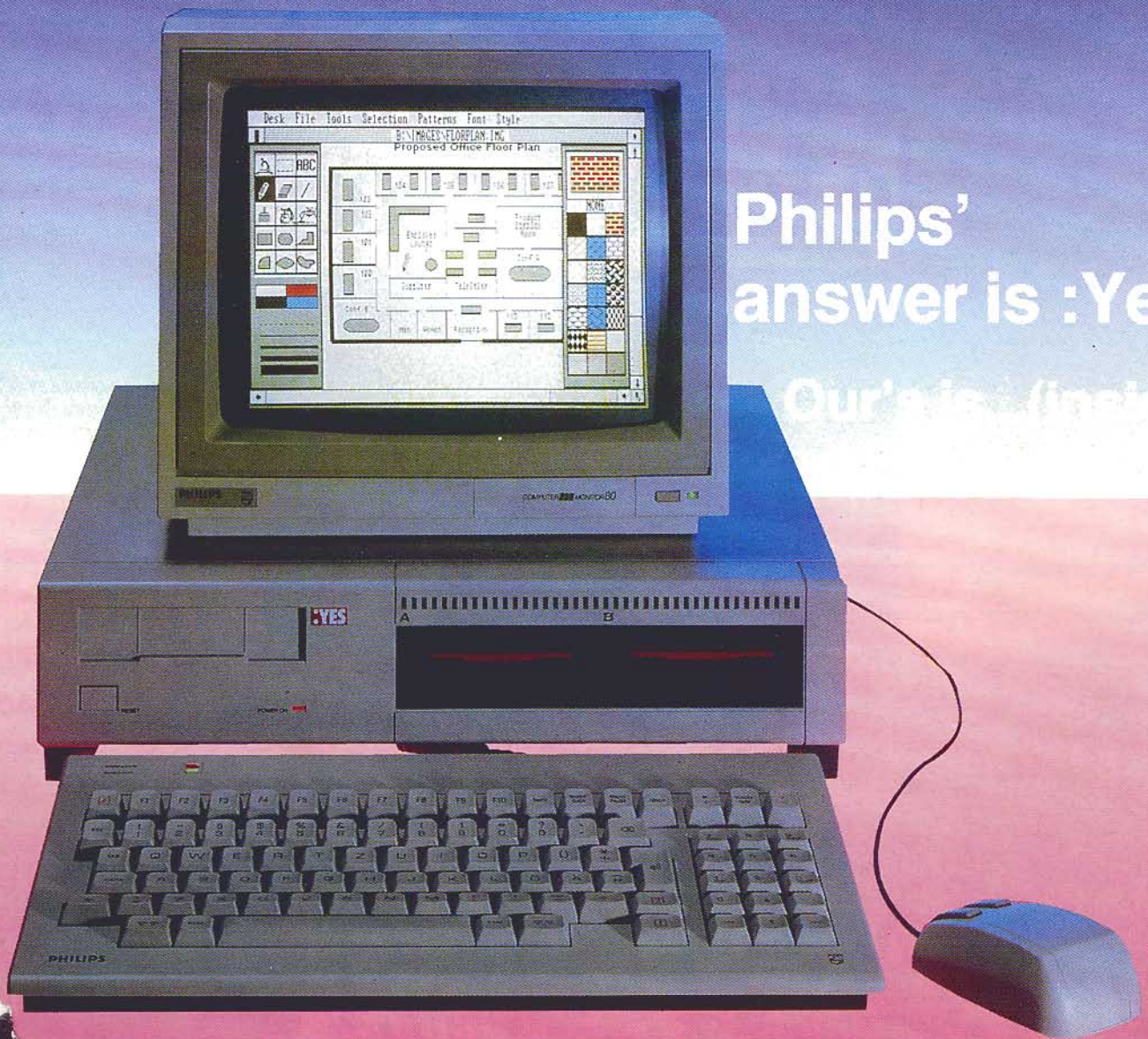
NEW ZEALAND'S PERSONAL COMPUTER MAGAZINE

BITS & BYTES

Jan. — Feb. 1986: $2.00



Philips' answer is :Yes

Find also, inside data on:

Panasonic's Executive Partner.
Under $4000 hardware survey.

The next wave of computing?
Teachers' advice to PC buyers.
B & B Volume 3 INDEX

NEW

When you've already made the best home computer, what do you do for an encore?

$1995
with Colour Monitor
$1595
with Green Screen

Amstrad CPC 6128

with Colour Monitor or Green Screen

The Businesslike CPC6128

By including a disc drive and 128K or RAM with the CPC6128, Amstrad has elevated the budget price computer beyond being primarily a games console into the realm where serious business applications may be tackled with ease.

Digital Research's famous CP/M Plus operating system keeps your CPC6128 disc filing in order while programs like Microscript and Amsoft Business Control system (dual disc systems) keeps your business affairs in order.

The Amstrad CPC6128 is the ideal computer for the small business, and what with rates, mortgages, HP, income tax, insurance etc just about everyone can benefit from running their personal affairs with the aid of a low cost computer.

Give all your correspondence the professional touch. Plan your domestic budget, file names and addresses, organise your time more effectively. Amsoft has programmes already available to do all these tasks and many more.

The Entertaining CPC6128

With over 300 colourful games already available covering everything from advanced flight and combat simulation to slick examples of all the arcade classics, the CPC6128 has an unfair advantage over its competitors.

There's shoot-outs, adventures, brain teasers, card games, 'simulations' – enough to keep the most agile and inquisitive minds busy indefinitely. As part of the CPC6128 package you will also receive CPM plus, GSX and Dr Logo, the world famous teaching and graphics language that introduces the concepts and ideas behind writing computer programs.

High Performance-Low Cost

The one thing you won't need a computer to work out is that the Amstrad CPC6128 represents outstanding value for money. You only have to check the cost of buying all the elements separately, 128K RAM computer, disc drive and monitor to realise that the Amstrad package is very hard to beat.

Wordprocessing and Amsword can improve the productivity of everyone from unskilled typist to trained secretary.

An Expanding System

There is a complete range of peripherals available to CPC6128 which plug into built in interfaces. These include a joystick and printers. The Centronics compatible parallel printer interface connects to a vast range of printers, from low cost dot matrix through to daisywheel printers giving superb print quality.

The expansion connector at the rear of the CPC6128 contains all the signals necessary to implement a wide range of add-on peripherals. Modems, light pens, speech synthesizes and serial interfaces are amongst products already available or in development by either Amstrad or independent vendors.

Compatibility

The Amstrad Serial Interface (RS232C) is much more than just a complete means of connecting serial printers and modems. It's a complete extension and expansion system that incorporates its own ROM software to emulate terminals so that your CPC system can work in conjunction with mini and microframe computer systems.

There's a full PRESTEL mode with graphics and colour.

The built in ROM BASIC for the CPC6128 is in the tradition of excellence established by the CPC464 and CPC664. Programs written using the CPC464/CPC664 BASIC will run on the CPC6128.

Amstrad Join The Club

As a member you will enjoy regular magazines, competitions for valuable prizes and contact with other Amstrad users.

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RES 729

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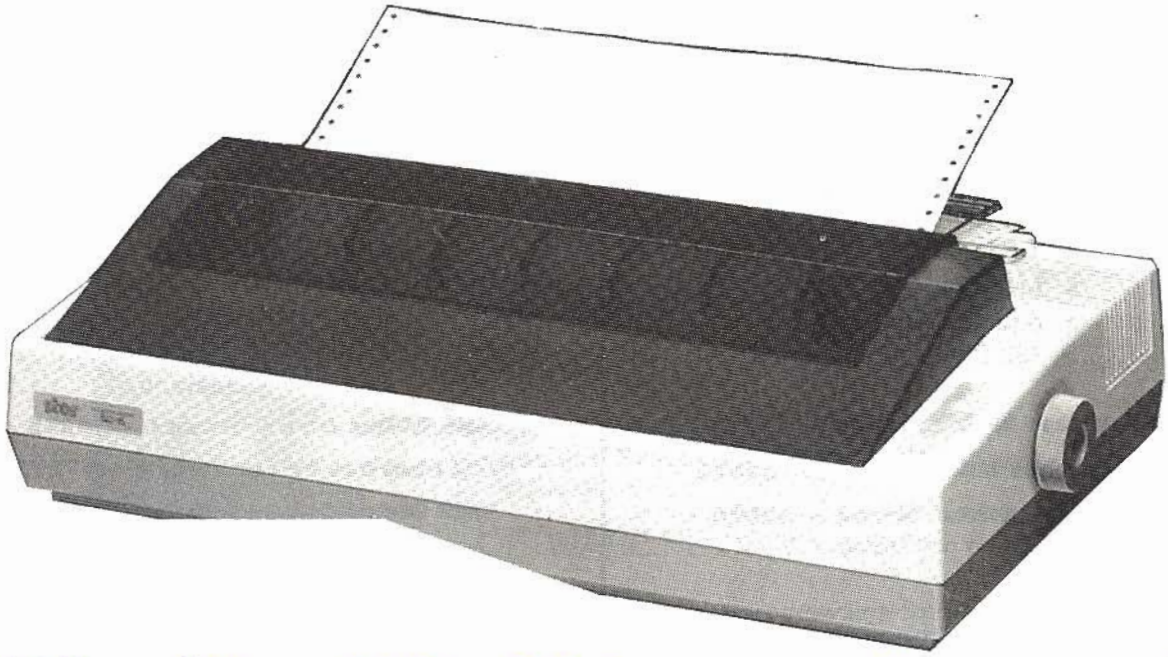

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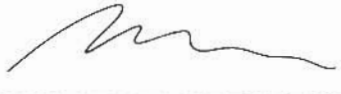

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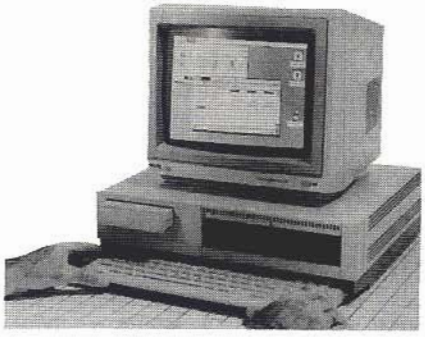
January/February 1986. Vol 4, no. 5



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Now shaky

Computer Now Ltd was in receivership just prior to the Christmas retail rush, but according to the company's appointed receiver only the Ponsonby Raod store was being cleared of stock.

The South Auckland and Browns Bay branches were then unaffected by the disposal of Computer Now assets.

Laurie Chilcott, of the Smith, Chilcott and Co accountancy, said those other branch stores were held by subsidiaries of Computer Now Ltd.

Similarly the management consultancy, Consulting International, was outside the action as an associate company.

On the bright side, the Ponsonby store's stock clearance was well-timed for the Christmas spend-up.

Coco down

The Tandy home colour computer, the Coco, has been reduced by $240, to $555.

Computer Advances in Auckland has also announced two new Tandy models: another lap-top with built-in 3½-inch disc drive, and its version of an enhanced PC-AT.

Big sales

Farmers Trading Company had a merry Christmas with its computer sales.

The main line was Amstrad — Farmers Trading Co having withdrawn as a Commodore vendor since the early December retirement of Fountain Marketing as a Commodore sub-distributor.

Farmers' home entertainment merchandise manager, Dick Barter, says another line withdrawn was the Amstrad 664, the early disc drive "tester" machine.

Its main computer sales were of the tape-driven 464 unit.

The retail chain's handling of the word-processor 8256 was limited, he said, but the newer Amstrad disc-driven 6128 was selling strongly.

Meanwhile Farmers' Sega price, at $199, had successfully positioned this home computer as a games machine, said Barter.

Effect of duty cuts

There was no customs duty on computers and therefore computer prices were not dramatically affected by the government's December 19 cuts in duty.

Expectations of shoppers however were otherwise, and prices of some brands were to further drop early in the new year to effect "duty cuts" in line with other electronic appliance discounts.

Bits and Bytes' view is that the duty cuts heralded an opportune time for some distributors to reduce further their own margins on computers in order to be more competitive.

IBM manoeuvres

IBM PCs and peripherals were discounted 15 percent by IBM NZ Ltd in early December — apparently in response to the increasing market prominence of its emulators like Sigma, Multitech (Dick Smith) and others offering significant price incentives.

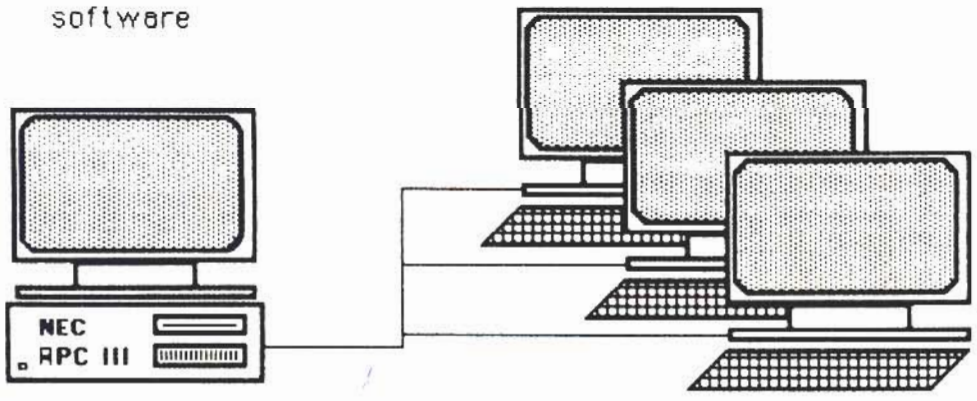
The compatibles were selling for less than $2000.

Meanwhile IBM's problems with unreliable hard discs packed with its AT model have been overcome — most customers who had purchased the faulty line having since been offered free replacement discs.

IBM NZ's PC distribution and retail manager, Murray Jurgeleit, also reports JX sales being encouraging, particularly in the small-business sector. Larger businesses, he said, tended instead to remain loyal to the 5¼-inch disc format.

MLS ANNOUNCE TIME-SHARING

This unique low-cost product turns a single-user PC into a high-performance multi-user system. Simply add on "dumb" terminals and you can run the full range of MLS multi-user software



MLS Time-sharing will be supplied only on selected machines and is initially available on NEC's APC III.

For more information phone M L Systems on Ak 836-0558

MULTI-USER

Aggressive

After a year of heavy advertising expenditure, Amstrad distributor Grandstand Leisure was planning another marketing tack — discounting.

Price drops in February were planned.

At time of writing (December) actual discounts were not definite, but managing director Bill Fenton was considering slashing $400 off the 6128 single drive/screen/128K ram unit, to $1295, and $600 off the 8256 word processor, to $1895.

In its first month here, less than 200 8256 w/ps sold but Fenton attributed this slow buying to pre-Christmas uncertainties.

Memotech dropped

John Gilbert Electronics Ltd is dropping the Memotech home micro distributorship — its remaining stock being almost halved in price at $500 per unit.

The reason is claimed a lack of support from Memotech in the UK for both parts and software.

Regarding this micro's refined market image, one Gilbert staffer said the Memotechs were still not beyond the odd breakdown, but unlike Rolls Royce had non-existent servicing support.

Sharp tactics

Beechey and Underwood Ltd is enticing custom for its Sharp business micros by throwing in with each computer three modules of The Financial controller, accounting software written locally by Intersoft Systems Ltd.

The software, initially covering debtors, stock control and credit/debit analysis, is described as "fun, fast and accurate".

Fastest Sord

Mitsui Computer Systems has released the Sord M68MX, a 16-bit desk-top micro, costing $7,500, which runs at 10 Mhz.

Its 512K ram is expandable to 3.5 Mb ram, and it can support 1.2 Mb floppies and 20 Mb hard discs.

Compaq arrives

In February Paxus Commercial Systems is scheduled to launch the complete range of Compaq micros.

The 14 models will be priced between $5000 and $15,000, the top-line model being an IBM-AT matcher.

The US-sourced portables and desktops are built around the same processor chips as in IBM PCs.

Colour upgrade

The 180 cps dot matrix Juki 5510 printer, costing $1100, is being released with a colour kit upgrade option, costing an extra $200.

The colour kit avails seven colours and extra buffer memory.

"THE HACKERS HANDBOOK"

A complete manual on all aspects of the popular sport of hacking into computers. Takes you through each step.

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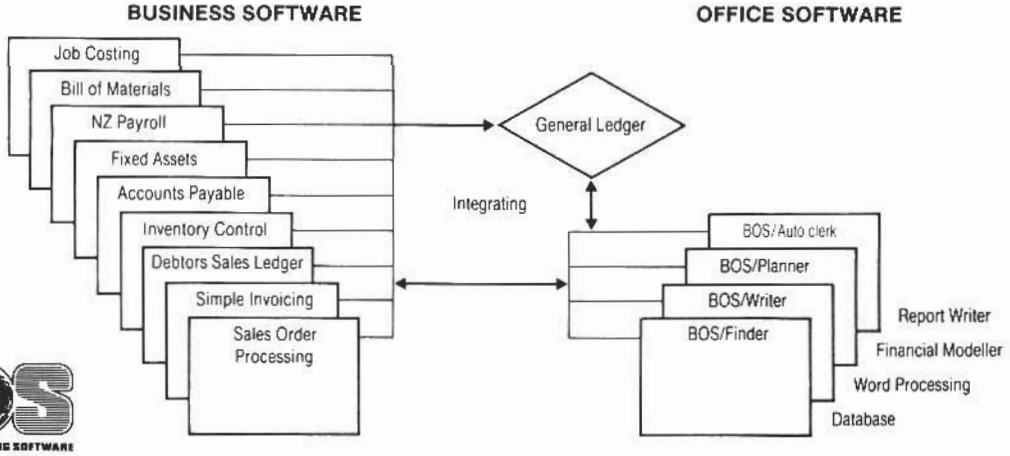

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Sanyo reshape

Autocrat Sanyo Ltd, the NZ parent of Sanyo Business Systems, has announced a major restructuring effort "to bring it back into profitability".

Sanyo Business Systems' general manager Bill Wouters said the move into larger premises early in the new year heralds a busy schedule of product launches over the next eight months.

The business systems company continued to be a profitable division for Autocrat Sanyo, he said.

There would be a major push of Sanyo-Icon's Supermicro, and Sanyo's matcher for the IBM-AT.

The Attache range of accounting software is also added to the line-up.

Commodore release

Commodore Computer NZ Ltd is extending its business range of micros with a 256K, single floppy PC-WS (work station) and PC-PLUS, which has 512K ram, dual floppies and a 10 Mb hard disc. They are for networking.

Digital's hottest micro

DEC's 15-year-old PDP micro range is extended with the release of the PDP-11/83, a 16-bit micro which can support up to 33 users and be configured to more than 1 Gb of storage.

Complete PDP-11/83 systems are priced from a mere $99,336 for the desk-side version.

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8086 10 Mhz Turbo	$2900
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80-287 for AT	$725

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64K Memory Upgrades (9 chips)	$ 49
256K Memory Upgrades (9 chips)	$ 165

MEMORY EXPANSION CARDS

512K Memory Card — no other features	$215
AST 6PakPlus Multifunction card	$895
ORCHID Conquest Multifunction, 2Mb capacity	$895
ORCHID ECCELL AT Multifunction, 3Mb capacity	$1255
AST Advantage for AT 128K RAM 3Mb capacity	$1250

UPGRADE CARDS

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Hercules Monographics card	$ 900
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Hercules Short Colour card	$ 595
Sigma (Hercules Mono compatible)	$ 445
Sigma Colour graphics	$ 330

DISK DRIVES

½ height Disk Drive 360K	$460
Tallgrass 25Mb Internal hard disk#	$2860
Tallgrass 25Mb/60Mb Tape External hard disk# (#includes controller & software)	$7500
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Screen-sharing

ML Systems in Auckland recently demonstrated to a Bondwell dealers conference the logic of installing multi-user screen-sharing systems for running on one keyboard, and one screen.

The concept is to enable various computing functions to run concurrently without need for the expense of linking several terminals and screens.

The base price for the software is $1,600, and ML Systems sees the product being pitched at the small business market.

Sinclair hopeful

Sinclair Research Ltd in the UK has announced a 30 percent increase in sales, due to its slashing of home computer prices, but a loss for its '85 year of almost $30 million.

Sir Clive gave the hopeful news of plans in '86 to introduce two new pieces of Sinclair proprietary technology: flat screen displays, and wafer scale integration.

Any volunteers?

Massey University's department of production technology is seeking two volunteer businesses to run its prototype software called Progress Control System.

It is aimed at job-tracking and late-job detection rather than job-costing or work-in-progress valuation, and runs on IBM or compatible micros.

The system is a stand-alone, and does not require pre-stored operations routing details for each made-in part, says the project leader, H.J. Baraclough.

Stock clearance

Software importer/wholesaler Imagineering held a "garage sale" to clear its stock of old software, like Visi-On, prior to Christmas.

The company said the sale was not establishing a precedent and featured only the software that dealers had difficulty in shifting.

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Send three 25cent stamps for catalogue.

Philips' :Yes

Will you say ":Yes, please"?

by Peter Ensor

Ever wanted to use those MacIntosh style pull-down windows on your MS-DOS machine? The Philips :YES computer lets you have the best of both worlds.

Philips released late last year a machine which is an integration of several machines into a single package. The machine is aimed at the professional-small business-hobbyist market as a decent quality product at low cost.

A dealer network has been set up to distribute the computer but with education buyers Philips prefers to deal direct: with presumably bulk buying privileges and lack of a dealer markup this seems a sensible strategy.

The system runs the DOS-PLUS operating system, a sub-set of Digital Research's Concurrent Dos, which supports simultaneously the MS-DOS and the CP/M 86 operating systems.

Both operating systems are supported simultaneously through the use of different file extension names for the different operating system programs. Switching between the two operating systems is entirely transparent to the user.

The operating system also features simple multitasking with foreground and background processing capabilities. DR NET and GSX graphics are also supported.

The network abilities will be especially important to the success of the machine as a classroom tool.

By using the network, diskless machines can be used and at a retail price of approximately $3000 per machine (less for schools) this will make a low cost network.

Four windows

Concurrent DOS is available for purchase separately, and this will enable users to run up to four separate programs simultaneously and in real time. Each of the programs can have their own window on the screen or one program can fill the full screen, as the user desires.

The purchase of Concurrent DOS also includes the DR NET network program. To run the network successfully 640K of RAM is required by the file server computer.

With two operating systems being combined some of the commands have been altered.

Floating disc drives are a feature on this machine. Any directory path such as \APPS\WP\DATA\ can be assigned to one of two drive letters O: or N:. Specifying the appropriate drive letter will default a path to the subdirectory DATA on the current drive.

If an old friend of an operating system is what you desire then MS-DOS version 2.11 and GW BASIC can be purchased to replace the DOS-PLUS operating system supplied.

However, the power of the system does not lie in the operating system alone. With the machine comes a selection of software.

Front-end help

For the first time user of a computer, there is a menu-driven front end program. This starts up when the computer is booted or by command and allows the user to issue commands via the menus.

While this program will always be used by some users, others will soon disable the package and key in the command straight to the DOS.

This option includes configuring the machine for the various system options and the disk maintenance tools.

While this is a good package it is slowed down by the disc drives each time it is reloaded after completing a function.

Open Access is an integrated package of six different programs which is bundled with :Yes "professional board" pack ($700 — $1400).

Word processing, a database, a spreadsheet, a graphics program, a time management program and a data communication package are included.

Info Management, as the database program is called, forms the basis of all the other programs. It has a versatile query type language with a menu driven database handler and report generator.

Supporting this is a spreadsheet package. This performs all the standard spreadsheet functions and passes information to other packages for graphic display.

Three-dimensional

The graphics display package creates not only the standard histograms and line graphs, it will also draw three-dimensional high resolution graphs from data supplied.

The word processor provides a good range of the basic functions. These are enough to produce reasonable documents.

Time Management consists of an electronic calendar for appointment keeping and address card keeping. But no matter how "good" this type of program is, I am always sceptical about how often it would be usefully employed. A notebook diary seems to be far more convenient to use, and much more portable.

The last major section of the package is the communication section.

This enables files to be sent from one computer to another via the serial link.

For a system with two computers running Open Access, one computer may become the master and have access to the other computer's files.

A cut-down Open Access is initially supplied with :Yes as standard. But this initial package only has the spreadsheet and some operating utilities. When the professional board is purchased the full version is supplied.

Logistix is also offered for this machine. This is a spreadsheet with "the fourth dimension of time".

It has the functions of a database and graphing like many other spreadsheets on the market, but it also has functions for manipulating timesheets and critical path analysis.

With options to vary the days worked (i.e. omit Sundays or other days from the analysis) and the hours worked it is able to show critical paths through a project.

I can see this feature becoming a useful addition to other spreadsheets.

The colour presentation of the display makes it very easy to use and I would use it in preference to some of the several other spreadsheets supplied.

Mac-like

A MacIntosh look-a-like package is also available.

This is the GEM package written by Digital Research for PC DOS machines. It consists of a desktop — which is the same theme as for the operating system command processors — and the application programs.

(Continued on page 15)

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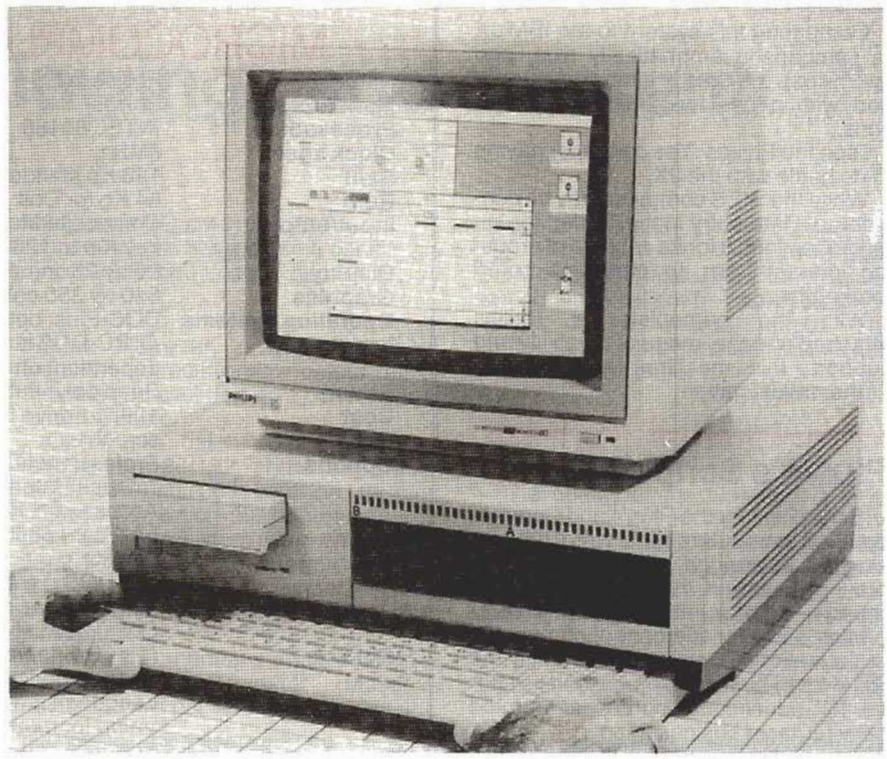
The desktop is retailed for $195, if purchased separately, but will normally be included with the first application program purchased. At the time of writing (December) the only package that was available in production quantities was the GEM DRAW package at $700, including the desktop.

Other packages to become available are GEM WRITE and GEM PAINT. Also supplied with the review machine but purchased separately was a thick GEM programmer's manual for writing application programs.

Other packages that are available for demonstration are the Wordstar word processing package, DBase II, Turbo Pascal and the Multiplan spreadsheet.

The screen emulates a subset of the VT52 or VT100 commands with additional commands to make use of the extra features available.

The machine hardware is neatly presented. The basic machine comes with 640 by 350 bit resolution colour graphics as standard along with 128K bytes of RAM. The choice of a screen is up to the user.



New interface

The number of disc drives can vary from none, if the network or a ROM key is being used, to two drives fitted as standard. Each of these drives are 3.5¼-inch microfloppies holding 720K of data.

For applications where either a disc drive is not desirable or in addition to the disk drives, a ROM key can be inserted into the cartridge slot in the front of the machine. This holds a maximum of 128K of code.

Hard disk drives can be added using the SASI port as well as 5- inch disk drives. The latter drives are supplied in their own cases, complete with power supply, and are intended for use mainly by dealers copying data from the standard 360K disks on to the microfloppies. They are available to the public, for $1000 each.

The keyboard is slim with tilting legs. LEDs are supplied for the Caps Lock and Num Lock keys. When the machine is not in use the keyboard can be slid under the machine into a carry slot.

The key layout is similar to the IBM PC layout but with the function keys along the top rather than down the lefthand side.

Faster, bigger

The processor is the 80186 running at 8MHz and supported by 64Kb of ROM. This processor uses a true 16-bit wide data bus rather than the 8-bit wide multiplexed bus of the 8088. This results in a faster throughput of data and hence a faster speed.

The ROM is bank-switched to allow more of the system RAM to be available to the program. This has the advantage that programs that are too big to run on other machines have a better chance of running on this machine.

Other interfaces provided as standard are outputs for a composite monitor, RGB-TTC video, and five-inch disk drives, as well as a serial and a Centronics port.

The only hardware upgrades that are presently being offered are the Professional board and a Local Area Network (LAN) card.

The Professional board contains either 128K or 512K bytes of RAM and a battery-backed clock and calender.

There are interfaces for a "mouse" and a SASI interface for the hard disk. As mentioned before, the full version of Open Access will also be supplied.

The LAN card, when fitted with the Professional board, uses up the two available expansion slots. To add more expansion cards to the system requires an extender card (not supplied here).

Great manuals

The manuals that come with the machine are impressive. While only the machine and DOS user guides will come gratis, there are full software and hardware reference manuals available.

The Open Access manuals are substantial and a pocket reference guide is supplied.

It is interesting to note that two big names, IBM and now Philips, have both produced machines that are not copies of machines that have gone before.

IBM brought out a machine running the unique PC-DOS, which a large number of manufacturers have since followed.

Now Philips has produced a machine against the popular tide of PC compatibles.

Official PC DOS calls to the :YES DOS are supported but any machine specific requirements such as access straight to the screen will not work.

Overall the machine is impressive and well-priced but with what does it tempt prospective buyers?

An investment in :Yes is cost effective, the machine is well designed, but what else can it offer?

The plastic finish is attractive, but the holes for inserting "things" are polific on three of the four sides.

The quiet fanless operation and the higher speed are certainly advantageous.

On the software side it has the DOS-PLUS operating system going for it with the abridged Open Access package and the menu-driven file manager.

The Concurrent DOS and the GEM series packages are good additions to the system and will appeal to many people.

And for those looking for a cost effective LAN system then this one is a serious contender.

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Comparing this system to the IBM JX (a comparison emphatically side-lined by Philips), the :Yes is almost level-pegged with prices for similar configurations.

I see the Philips :Yes computer having to do battle with the JX.

While the :YES computer may be considered a late entry in the market for 16-bit processors, it looks capable of arousing interest from an otherwise bored marketplace.

With the nameplate of Philips attached and the image of reliability and support, this machine is well worth further investigation.

Plus/4's Script Plus

Script Plus for the Plus/4 and Commodore 16 computers puts word processing into a cartridge, costing $90, to enable preparation of comprehensive reports, administration of small companies and management of community organisations. Commodore admits the Plus/4's in-built word processor "is useful for educational purposes, but too slow for most businessmen".

Features of Script Plus include a wide screen of between 40 and 240 columns, but still only a "window" of 40 columns.

MICROCOMPUTER SUMMARY

Name	Philips :YES
Manufacturer	Philips
Processor	INTEL 80186
Clock speed	8MHz
Ram	128 Kb standard, up to 640 Kb
Rom	64 Kb for Dos. Optional 128k Rom key.
Input/output	Composite Monitor, external flopy disk drives, ROM key (up to 128 Kb), serial, Centronics
Display	80 by 25 lines
Graphics	640 by 350 colour
Operating systems	DOS-Plus; optional is MS-DOS, Concurrent DOS
Languages	All PC-DOS languages, e.g. GW Basic, Turbo Pascal; dependent on compiler.
Sound	Beep only; audio output port
Cost	128K, 1 drive $3250: 128K, 2 drive $3900 — without screen
Options	Professional Board (512 Kb, battery backed up clock, "mouse" interface, SASI (hard disk) interface Open Access with 128K $700, with 512K $1400 LAN card $850 Logistix p.o.a. MS-DOS p.o.a. Monochrome monitor less than $400 typical Colour IBM style less than $1000 typical
Ratings	(1 — 5, 5 the best) Documentation 5, ease of use 5, Language n/a, expansion 5, Value for money 4, support 5.

Review unit from Philips New Zealand Ltd, Auckland.

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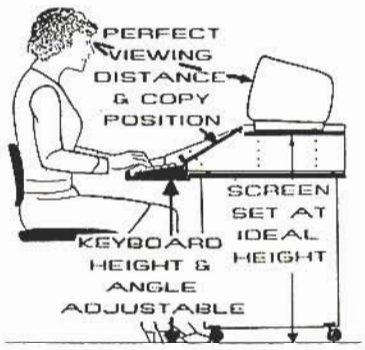

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PANASONIC'S EXECUTIVE PARTNER

Sleek, fast, glowing...and different

By Bevan J. Clarke

Be the first kid in your street to own a computer that glows red in the dark! The new flat flat-screen Panasonic Executive Partner has a plasma panel display with 640 x 400 pixels. Its crisp, high-definition images glow in a restful neon red.

The importers, MEC Ltd of Auckland, say that the Executive Partner is not intended to crowd its older sister, (still called the 'Senior partner' in the USA, but labelled here as the 'Panasonic Portable') out of the market but is meant to meet the needs of a subtly different market. For example, it can run at twice the usual speed!

We shall try to define its market role at the end of this review.

First let us meet and test the new member of the family.

The Executive Partner follows the former machine's tradition in being a 'luggable computer'! Its svelte portable-typewriter looks make the Senior Partner look dumpy — all-rounded like an early model Holden.

Although at 11kg it weighs only 4kg less, it seems to be lighter.

A slim profile (when closed) and a better carry handle make it easy to tote.

It needs no carry case (unless you're the sort to put loose covers over new sofas).

Across the back we find the power input and outputs for a parallel printer port, a serial RS-232 connector (with D-shell connectors) and a 60-pin bus expansion connector. The ports are covered individually with snap covers.

Option board

Inset into the right side of the machine is a hatch where one small 5¼" option board may be installed. This is the size of the 'short slot' of the PC-XT.

The manual's line drawing seems to show a modem but I found it ideal for my Microsoft Mouse's bus board. As with the older machine the power cord is not retractable.

To their credit the NZ agents have furnished the power cord with a tap-on plug. It is little attentions like this which eliminate constant irritations.

Executive takes up only a small footprint on your desk. A space 410mm wide by 540 deep is all that is needed. (A true PC with its keyboard in a comfortable place eats up 510 by 660.) Its cooling fan is audible but now totally inoffensive.

Also in the 'Partner' tradition is the built-in printer. When you turn the power on output will normally be directed to this printer. However, pressing Alt/PrtSc instantly redirects printer output out of the other parallel port, to a conventional external printer.

Opening a hatch across the back reveals an 80/132 character printer which can print both with the 'thermal process' (in which the printhead's column of tiny resistors blacken thermal paper) and with the 'thermal transfer process' (in which the same resistors blast ink off a special carbon ribbon onto plain paper).

Ignore the manual's implication that special 'thermal transfer' paper is needed. Any paper will work, but the smoother the better.

If you run the MS-DOS GRAPHICS.COM program first then you can obtain excellent bit-mapped screen dumps on the internal printer. The printer clatters, the printhead clunks as it loads on to the paper for each line.

Basic print

The quality of the type-face and its variations is better than that of the Senior Partner but it is only 'basic dot-matrix' quality. This is a shame — I have a tiny typewriter which uses the same printing processes but with a 25-pin printhead to produce true letter quality.

The NZ cost for either process comes to about 20c per densely-typed A4 page.

(Continued 19)

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(Continued from page 17)

Although this is a distinct improvement on the previous machine's printer it is no substitute for an external printer for serious work.

What use is it then? I have found that one does not use it often, but when you need it you really appreciate it.

There are times when the need for hardcopy is urgent; at a conference, in a hotel room, in the field on the client's desk — if you ever have the need for immediate printout of a file then the Executive will be a godsend. The simple printer mechanism adds very little to the cost.

But it does add 100 mm to the length of the machine. Despite appearances this is not a lap-top, unless you have a lap like a Japanese wrestler and an a.c. power socket in your navel.

Although it is portable, you have to feed it 240 volts. A deeply recessed switch by the small option-board slot allows a globetrotting user to flip over to 120v a.c. with a nail-file or swizzle-stick.

It takes 12 seconds to heave the Executive on to a desk, release and lift the plasma panel display from over the keyboard and turn the power on.

Since this is an IBM PC compatible the ROM boot routines then take 33 more seconds to run a diagnostic check on all the memory chips. A count-up in 32 Kb increments appears on the screen and once the memory is checked (256 or 640 Kb) then MS-DOS 2.11 is in control with all that that implies.

Superb keyboard

The keyboard is not detachable, but Panasonic know how to make superb keyboards. This one is IBM-standard except that the function keys have been moved back to their obvious place, a straight row above the number row.

To their right a row of four LEDs tell you of the status of your world. Two report on Numlock and Capslock. The third tells you which printer port is active — the external printer or the internal printer.

But the fourth — wonder of wonders — reports on the FAST mode.

Pressing Ctrl,Alt and Gray-Plus at once toggles this neat machine out of the 4.77 Mhz speed which is standard for a PC or clone, into the 7.16 Mhz speed rightly called FAST mode.

I used to think Turbo Pascal 3.0 was unbeatable value; my program to compute all the primes below 4000 took only 29.6 seconds. But toggle FAST on and the same program exactly takes only 13.0 seconds.

You may wonder why anyone would want to use the slow mode (which can also be triggered by a DOS call from within a program).

Certainly I have found no program which fails when run in FAST mode.

Perhaps Space Invaders suggests one answer. If you, too, are constantly beaten by your children at computer games, don't tell them about FAST mode. But if you have serious computations to make then the Executive Partner with its 8086-2 processor must be considered.

As a closet WordStar user I dream of using this machine in FAST mode and with my files in a RAM-drive. Oh that I could word-think as fast as this combination can word-process!

And putting an 8087-2 maths co-processor into the socket provided then should produce great results if you have the software to drive it (Turbo Pascal again?).

IBM-compatible?

Is this a true IBM-compatible? Of course, it cannot legally have the IBM copyright notice burned into its ROM, but software is the test.

The Norton Utility called 'SI' (system information) rates this machine a 1.00 relative to a true PC (and incidentally declares the computer to be a 'Panasonic Senior Partner'. Is the ROM largely the same?).

Like all clones BASIC is not in a ROM so programs in BASIC or BASICA will fail unless you first load BASIC off disk.

Within a wide range of software I have found the Executive Partner to run: PC-DOS 2.0 straight from an IBM PC, Lotus 1-2-3 (in FAST mode it's a real Lotus-eater!), Sidekick, Turbo Pascal (including programs which make machine language calls on the ROM and one which copies the ROM's bit-patterns for the character set and modifies it to produce italics & BIG letters), LPA Professional Micro-PROLOG with pull-down menus everywhere, Framework, and, of course, dear old Flight Simulator, the reviewer's standard test.

The most impressive and successful software test was running the new GEM package — Graphics Environment Manager — from Digital Research. Load this program and plug in your mouse and your PC- clone becomes a Macintosh work-alike with icons, menus, variable fonts and font-sizes and a MacDraw copy called GEM Draw.

It runs without any hitch.

Hardware compatibility calls for a more cautious comment.

The disks are in the totally compatible 360Kb 5¼" MS-DOS standard. No problem with your existing software base and no need to copy files across to 3½" rigid floppies.

On the other hand, no increase in storage capacity either!

I would have installed Panasonic's 5¼" drives with at least 720Kb, made the machine boot up in 360Kb mode and provided yet another mode-displaying LED — "VAST".

The only provision for installing an internal option board is the slot in the side where I installed my mouse board. Not much else is tiny enough to go in there.

There are not very many small modem or network cards presently on the market. So one may be limited to Panasonic's offerings.

To my knowledge they have not yet produced anything except a memory card for the Senior Partner.

The expansion slot at the back is not for direct plug-ins but is intended for connecting the expansion box (RD-9655) when it is released.

Easy expansion

The review machine came with 256Kb of RAM.

We are used to adding memory via a tedious process of populating an expansion board, opening the machine (put all those Philips-head screws down carefully!), slotting in the board, setting inaccessible DIP-switches to an obscure pattern with a knitting needle and a flashlight, then re-assembling the machine.

I have good news for you: the Executive can have only 256Kb or 640Kb and you upgrade it simply by opening a hatch in its base and replacing the 64Kbit RAM chips with 256Kbit chips. Then reset a one-bit switch.

Put the old chips in a handipack; keep them for one year, then post to MOTAT's computer museum.

The machine reviewed was the FT-70 with twin, quiet floppies. The FT-80 model has an in-built 10Mb hard disk. Since there appears to be just enough room internally for a small controller board, one could consider replacing one of the FT-70 drives with a do-it-yourself hard disk, such as that from Qubie ($US595 for 20Mb).

On the other hand, what do you need to plug into this machine? It already has built-in graphics, a real-time clock, printer and serial ports and can have a mouse added easily. If you need more perhaps this is not the machine for you.

Plasma screen

And what about the great innovation: the plasma-panel screen?

It is flat, flip-up and convenient. It tilts and holds its position over a range of angles. This is more useful for minimizing reflections off the un-etched glass than anything else.

So far eight users have joined me in testing the machine and without exception they have praised the clarity of the screen. Not one objected to the orange/amber colour but two secretaries found

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that they wished to have the screen further from their eyes — an impossibility with the integral keyboard.

The plasma screen is MUCH easier to view than an LCD screen. Three people side by side can view it comfortably.

The manual's hype describes it as "equivalent to a 12" CRT". Its diagonal is only 9¼! But if they really mean "As clear as..." they are making a fair claim.

On the test machine the background shade was not pure black but a faint glow. Whether this was a fault, an unavoidable current-leakage or a design choice is not known. When the screen lights the level of radio interference rises — it is already higher with this machine than with its predecessor.

Unlike the Senior Partner there is no RGB port on the back. The documentation refers to installing alternative graphics cards to provide full colour graphics. It states that the Executive will automatically recognize the presence of such a card and redirect output to the attached monitor. But such a monitor could not be perched on top of the computer.

But although the plasma screen is very readable it does bring us to the Executive's oddest features. For reasons of plasma technology (one presumes) each of the 640 x 400 tiny square pixels is either fully on or fully off. Neither the screen as a whole nor a pixel can be varied in intensity.

Making a virtue of necessity the manual claims that the "display has been set for optimal viewing under various lighting conditions and cannot be adjusted." This is a surprisingly fair claim, but nevertheless I would like a brightness control.

When I put a mesh screen up to cut out window reflections then I need to turn up the overall brightness to compensate.

With no polarizer over the screen (small wonder at today's prices) the only solution is to lower the venetians.

No shades

But other effects are odder: for PAINTing areas of colour the 8 or 16 standard colours (which usually map into 8 shades of green) are mapped into only 4 textures of orange. And for writing text in colour the same 8 shades are mapped onto 4 different type styles. Clever and effective, but odd.

The documentation is adequate: an A5 softbound BASIC book and an A5 plastic-covered ring-binder, all about everything else, which is mainly DOS. The contents of the standard DOS documentation have been adapted where necessary to the new machine but all the old dross is there as well, including how to use Edlin, the world's most horrible, obsolete editor.

Vendors like Panasonic should lean on MicroSoft, who should have tarted up this rubbish years ago!

Panasonic's documentation has improved. It's now up to the industry average, which is not saying much.

Where, oh where, are the tutorial disks, video tapes or audio casettes for rank beginners?

The best way to learn is still to have an experienced friend nearby.

So who is this machine for?

It is not for use on a sun-drenched desk. It is not for someone who wants to add full-length expansion cards. It is not for those who must have their graphics in colour or want to feed video output into a video-projector (a great option with the Senior Partner for meetings and staff training).

But it is a high-resolution machine which is very easy to view. It would suit anyone whose tired eyes cannot read a fuzzy 320 x 200 screen.

As a much smarter-looking machine than the Senior Partner it is for the fashionable.

It is for anyone whose need for a printer is occasional but urgent.

It would be fine for the accountant, surveyor or field engineer who wants to take his power-tool to the (240-volt) work-site.

It is for the travelling journalist or conference-goer who needs the whole power of MS-DOS and 640Kb on the road.

It is for anybody who wants portability and number-crunching with it. This includes everyone whose spreadsheets have grown to take more than 2 minutes to re-compute: the FAST mode is marvellous. Can anyone lend me an 8087-2 math co- processor?

Microcomputer summary

Name:	Panasonic Executive Partner.
Manufacturer:	Matsushita.
Processor:	8/16 bit Intel 8086-2.
Clock speed:	4.77Mhz or 7.16Mhz at user or program option.
RAM:	256 or 640Kb.
ROM:	16Kb.
Input/output:	Standard keyboard, serial port, parallel (Centronics) port, rear and side bus expansion slot, can take mouse.
Display:	Neon gas plasma panel standard (monochrome orange/amber). Conventional CRT graphics monitor connectable via bus expansion port.
Operating systems:	MS-DOS 2.1 supplied. Will take anything IBM PC can take.
Languages:	All MS-DOS and 8088/8086 family languages. BASICA supplied.
Graphics:	640 x 400 pixels resolution. Usual BASICA graphics. Only 4 'colours' available on the plasma panel & those are textures of orange.
Sound:	Internal speaker's beeps and tones.
Options:	10Mb internal hard disk. One internal slot for a small card. One slot for connection to an expansion box.
Cost:	FT-70 $5,995; FT-80 to be announced.
Reviewer's ratings	**(5 the highest): Documentation 4; ease of use 5; language 5; speed 5; support 4; value for money 3.**

(Review machine supplied by M.E.C. Ltd, Auckland)

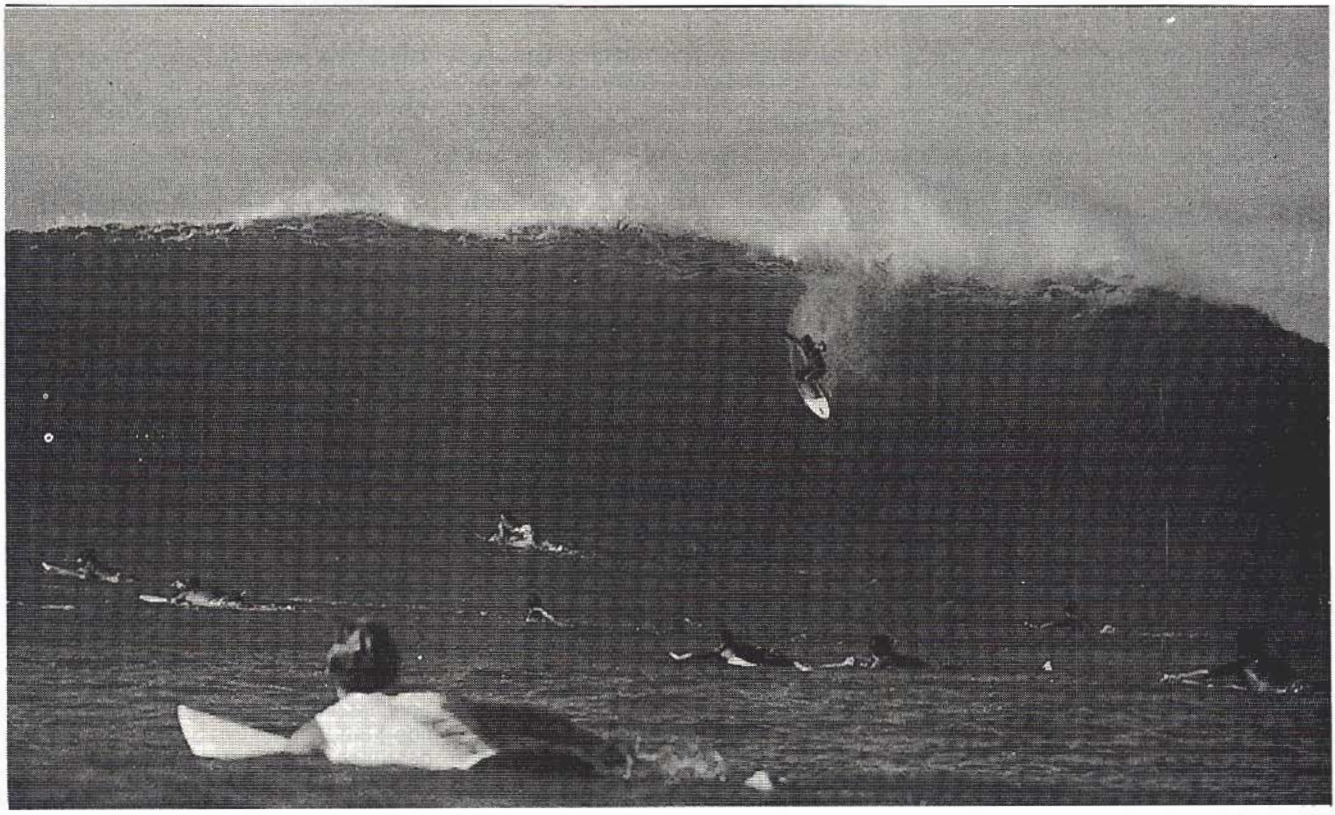
Donations to Sallies

CCL Business Systems has given the Salvation Army a cash donation of $5000 and a Texas Instruments computer worth more than $10,000 to help the Army recover from the tragedy involving their motor launch Kaheno.

The Kaheno was swamped and badly damaged with the loss of four lives in September.

The computer will enable the Army to upgrade its record keeping, which has been on a manual card index system since its rehabilitation programme started in 1907.

Auckland software importer Micro Source Ltd has donated Open Access.



Multi-user micros: The Next Wave

by Mark James

When 16-bit microprocessors first hit the market in the late 1970s, their makers bragged that each one of them held the computing power of a 1960s mainframe computer. While technically true, the chips have been used in ways very different from those of their room-sized ancestors.

Most microcomputers have been built for single-user, heavily computational operations such as colour graphics, spreadsheets and fancy word processing; few have thought of microcomputers as multi-user, time-sharing systems.

That is now changing. Multi-user micros may well be the next wave, and the reason for the change is, of course, falling costs.

Hardware

In terms of hardware, a computer needs four items in order to support each extra user: a terminal, a serial port to attach it to, extra memory, and extra disk space.

The price for each of these ingredients has plummeted in the last few years, along with the cost of the micro itself, to the point where the price of a multi-user system today is less than that of a single-user system a few years ago.

Terminals: Very large scale integrated circuits and cheap labour in Taiwan and Korea have brought the prices of video terminals down to less than half of what they were in 1982, and the trend continues.

Even the cheapest "dumb" terminals now have microprocessors that control character fonts, video attributes such as bright and dim, programmable function keys, and often even special editing modes.

At the time of writing, list price for such terminals in New Zealand starts at $1500; various discounts can be had, and used terminals are much cheaper. Graphics and colour, however, are still expensive options.

Serial ports: Most 16-bit computers today are sold with at least one serial port inbuilt, for use with modems, serial printers or communication with larger computers.

While some companies still charge $100 or more for add-on serial-port controllers, an article in the March 1985 issue of Byte magazine showed how to build your own for US$15; and component prices have come down since then.

For the IBM PC and compatibles, boards are available with four and even eight serial ports.

In general, both the serial port and the terminal must support the RS-232C communications standard.

However, a note of caution: this "standard" leaves plenty of room for variation in terms of the cables required to connect the terminal to the port. Connectors may have 25, thirteen or nine pins; may be male or female; and may require varying numbers of the pins to be wired in various ways.

If you don't understand these issues, it would pay to consult someone who does.

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(Continued from page 21

Memory: With the price of RAM chips dropping, there are now few 16-bit computers sold with less than 256K bytes of main memory; and the chips for an upgrade to 512K cost well under $100, if you install them yourself.

Most multi-user operating systems will function in 256K, although some not very efficiently. In general, since memory is cheap, a multi-user computer should have as much of it as is practical.

Disks: A recent price war in California saw the price of a five-megabyte hard disk drop to US$89 (without controller). The IBM PC/AT has popularised high-density floppy disks and caused their prices to fall as well.

Increasing competition between American and Japanese manufacturers, and between 5¼-inch and 3½-inch formats, will guarantee that the bargains continue.

All of the multi-user operating systems to be listed in next month's Bits and Bytes recommend hard disks, for the good reason that they are much faster than floppies; with several people making demands on them, floppy drives can be a real bottleneck.

In addition, disk-hungry operating systems like UNIX will not even fit on any but the densest floppy disks, although the leaner ones like AMPS will fit on dual 360K diskettes.

Networking

There are two other approaches to multi-user micros that require further hardware and have some advantages, but also some drawbacks.

The first is networking.

In a network, every user actually has his/her own PC, and these are linked by high-capacity communications cables through which they share expensive peripherals such as hard disks and printers.

The advantage here is flexibility: If part of the network goes down, the rest of it can continue to work.

The disadvantage is cost, since each user must have a full computer plus a network controller board; networks are not really multi-user systems, except from the point of view of the shared peripherals.

The cable does not come cheap either (there are some exceptions to this), nor does the software (disk servers, print servers and the like) that shares the peripherals.

The other approach is the multi-processor PC.

This involves adding boards to an ordinary microcomputer, each of which contains, in effect, another PC minus the peripherals. Ordinary monitors and keyboards may then be attached to each card, and software in the "master" PC governs the sharing of the disks, printer and other peripherals.

The advantage to this method is that each user may run his/her own copy of MS-DOS programs, with minimal effect on other users; also, without the necessity for cables, the total cost per user is generally less than that of a network, although still higher than that of a true multi-user computer.

We shall limit ourselves here to the consideration of true multi-user systems — that is, several users sharing one processor, one chunk of memory, and one set of peripherals.

Judging systems

There are several multi-user operating systems for microcomputers on the market now, and more are likely to appear.

Each has strengths and weaknesses, and none stands out as the best for all applications; some, for example, are fine-tuned for business-oriented database operations, but would be painfully slow at scientific number crunching.

Some support glittering graphics and elaborate word-processing functions, but slow to a crawl once the second user tries to start working.

Functionality and efficiency, of course, are issues for any operating system, whether multi-user or not.

One consideration that is particularly relevant to multi-user systems is security.

In any multi-user arrangement, two important security issues must be dealt with: co-ordination between users of the same equipment, and the protection of each user's programs and data against

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accidental or willful damage by other users.

Mainframe computer systems have long had to face these problems, but their solutions are not always appropriate for small computers.

Furthermore, not all multi-user micros available today provide even the most fundamental security measures.

Program-locking

Any multi-user system should have some form of record or program locking.

This means that only one user should be able to make changes to shared data at one time; otherwise, inconsistencies could develop.

Imagine, for example, a simple banking system in which a client has an account balance of $1000. One teller wishes to process a deposit of $200, while another has a check for $50 to record. Each reads the current balance, $1000; the first teller adds $200 to it and stores the new balance of $1200 onto the disk, while the other subtracts $50 and stores $950 — overwriting the first teller's work. Result: $200 is "misplaced", and the bank loses one irate customer.

At the simplest level, a multi-user operating system could merely prohibit more than one user from running the accounts program at one time; this is called program locking.

A more sophisticated approach is record or file locking, in which the acounts program would simply lock the file or the individual record that it is using, allowing other users to run the same program on other data.

This is especially useful when someone has to process a long series of transactions in its entirety before allowing anyone else access to that information.

Unfortunately, this means that at every transaction, the system must check the status of the records in question; such complexities are open invitation to waste time, and some badly-written operating systems take full advantage of the opportunity.

Queuing

There are other system resources apart from the data that need sharing.

If two people want to use the printer, there must be some kind of queuing mechanism, and it should not freeze out the user while printing or waiting to print.

Ideally, the system should be multitasking as well as multi-user.

That means that one user should be able to run more than one task at a time; if a job does not require continuous human intervention (generating a report, for example), there should be some way to shove it into the background and let it churn away unattended, while the user moves on to other tasks.

The other security issue is that of data integrity. Data can be damaged either by accident or by malice.

While the press gives much attention to the problem of "hackers", much more time and money are lost through inadvertent data loss, as anyone knows who has left a floppy disk to melt on the dashboard.

Safeguards

It may be true that no one can stop a determined "inside hacker" — a vengeful former employee, for example, who knows the system well. But most intruders do not fall into this category.

A simple password system will keep most of them out, and an equally simple count of unsuccessful attempts to log on will take care of nearly all the rest. It is surprising, however, how many multi-user systems lack even these elementary safeguards.

The most fundamental protection against accidental data loss is the ability to take back-up copies of both programs and data, and any decent computer system must provide a back-up utility.

If a problem occurs, the system can be restored to its status at the time that the back-up copy was taken; however, all work since then is lost. This is an important consideration for multi-user systems, especially those with sophisticated database operations with indices at several levels.

A power failure, a scratch on the disk or a bug in the database software could render huge swaths of data inaccessible.

In this case, the ability to restore only selected parts of a back-up would be useful, instead of forcing all users to surrender all work done since the last back-up.

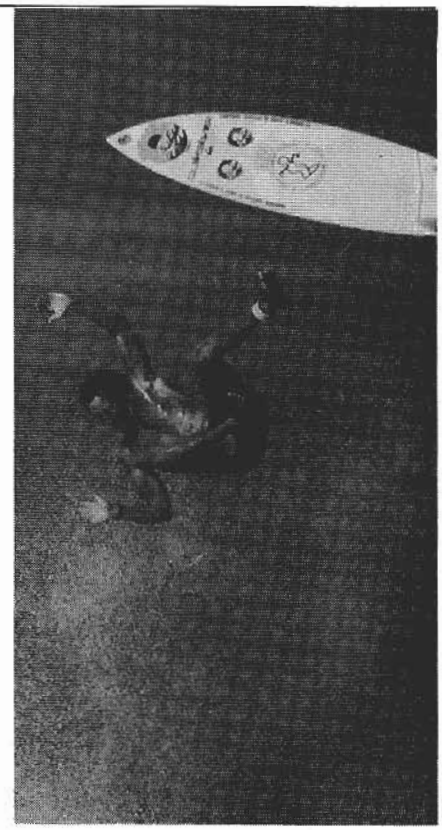
Log file

In a multi-user environment, simple back-up copies are sometimes not enough.

Even if the entire system is backed up once a day, there is still the danger of several people losing as much as a full day's work, and particularly for businesses, this might not be acceptable.

A further refinement to the idea of back-up security is "transaction logging", where all transactions are written twice, once to their proper files and once to a special log file.

If even the data are destroyed and a back-up needs to be implemented, the log file can then be applied to the backup copy, and all of the day's work can thereby be recovered.



Transaction logging works, of course, only when the log file has not been destroyed along with the main body of data.

There is also the problem of efficiency. With logging, the computer must perform two operations instead of one, every time it wants to write something to disk.

The less efficiently-designed microcomputer operating systems cannot handle this extra load.

Popular systems

Until recently, to have more than one user on a computer you needed to purchase at least a "supermicro", a computer whose price tag made it resemble more a minicomputer than a micro.

But this is no longer true.

There are several operating systems now available that can support three or more users on a simple IBM PC/XT or compatible, and some can go even smaller than that.

In next month's Bits and Bytes we will consider the various operating systems as they would function on a simple, Intel 8088-based MS-DOS machine. They are judged accordingly to multi-user functionality, efficiency, ease of use, and the security issues outlined above.

Each will be evaluated both as an environment for writing programs and as a system for the end user who might not be very comfortable with computers.

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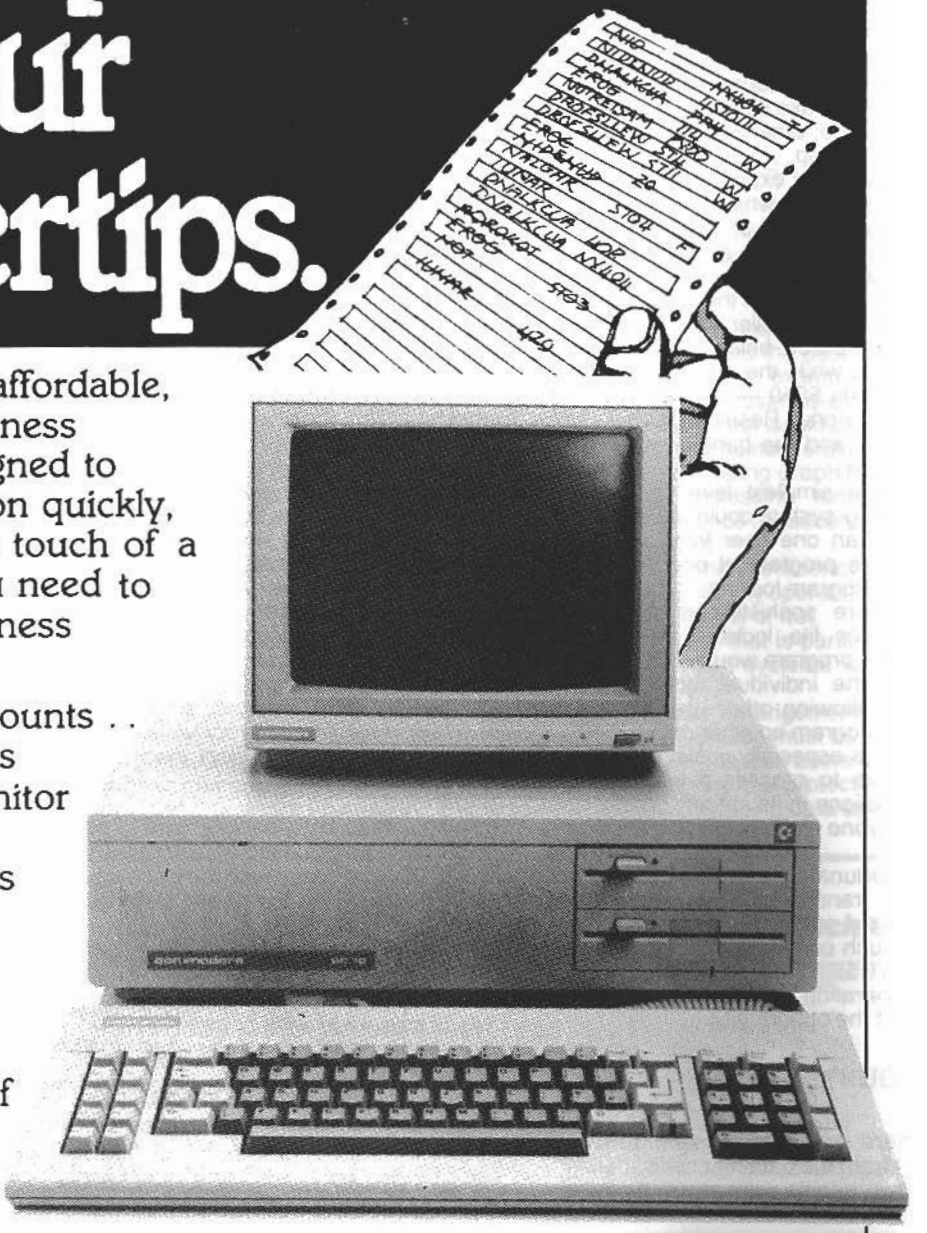

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Teachers advise on computer buys

by Colin Marshall

Mid-1985 saw a group of 22 Auckland and Hamilton school teachers meet to discuss guidelines for schools' computer hardware purchases. They aimed to provide primary and intermediate schools with informed guidelines when making decisions on hardware purchases.

The result was a booklet entitled "Computers in Primary Schools", which was distributed to schools late last year.

It aimed to assist schools in the following considerations:

1) Why buy a computer for your school?
2) How to select software and hardware.
3) Organisation of equipment and programmes.
4) Ways to introduce equipment into schools.

The booklet was intended to be used in conjunction with the Department of Education's Computer Courseware Development Unit's "Newsletters".

Rather than recommending a particular computer or listing a recommended range of brands the focus was on the roles of computers in schools.

Why buy a computer?

In the school situation there is a wide range of situations in which computers are being used, for example: in administration, information management, computer assisted learning (CAL), simulations, word processing, remedial and extension exercises.

The intent of this section of the booklet was to help the individual focus on the objective of having school computers.

The overriding consideration is software availability.

There are some "beautiful" machines out there, but they are useless unless they have suitable programmes to run.

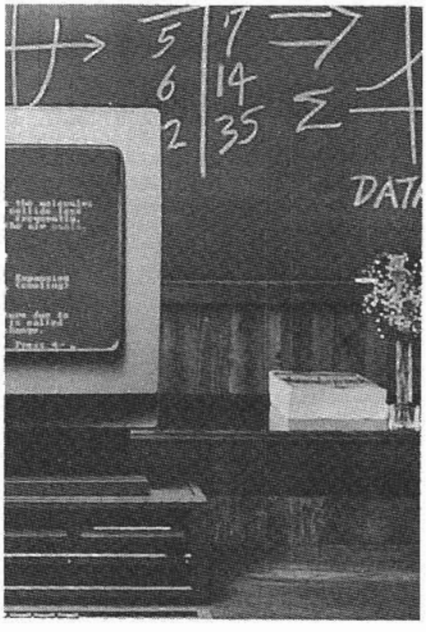
Selecting hardware, software

The booklet advises to look for software addressing specific needs. You should seek the advice of others using similar software.

View the software working, before purchase. In practical terms this means hiring programmes from dealers, for hands-on experience.

Every user should at least look at the "essential" option of word processing.

Most important is to disregard dealers' promises of certain programmes being available at a given time — especially if the programmes have not yet been released in New Zealand. Here we



are subject to various delays in getting material from overseas, and often do not see locally the software advertised in overseas magazines.

The wide availability of software is the most important decision in purchasing a machine.

The one exception to this, mainly applicable to business users, is when a programme is required to be industry specific.

Custom programming is not cheap, therefore teachers/parents should view software written for similar users, and talk to clients of the programmer involved.

Hardware.

"Computers in Primary Schools" suggests that schools look at the following as reasonable bases for buying a computer:

- 64K minimum memory,
- Quality colour monitor,
- Disk drive,
- Typewriter keyboard,
- Upper/lower case with descenders,
- Rugged, durable construction,
- Connectable to a printer,
- Good dealer service and support,
- Available software,
- Manuals with clear instructions,
- Colour and sound capability.

Software

Next the booklet suggests a series of questions that schools should ask suppliers of hardware — and to expect affirmative (yes) responses.

- Is there an established software base for the machine?
- Are you prepared to demonstrate your

(Continued on page 27)

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"The company (Commodore) has gone to great lengths to produce a new, 'State of the Art' look while preserving compatibility with 64 software and hardware: a smart move since it provides the 128 with an instant base of thousands of software packages."
Personal Computing

"The 80-column display, 2 MHZ microprocessor, 128K of memory (theoretically expandable to a megabyte), CP/M plus, and fast double-sided disk drive make the 128 a capable business machine, competitive with the much more expensive IBM and Apple computers."
Computer's Gazette

"Commodore deserves applause from all quarters of the industry for at last establishing compatibility within their range, yet producing a really exciting machine . . . It is also capable of running CP/M and well warrants the description of both home and small business computers."
Your Computer

"When you look at the C128, consider these factors: The wealth of existing software that is compatible with the C128 system in the areas of business, education and entertainment; The amount of that software taking full advantage of the sound and graphics features; The quality and extensiveness of its built-in BASIC; The cost of peripherals and hardware. Considering all it has to offer, the C128 is a personal computer that should make Apple cringe and IBM raise its eyebrows."
Run Magazine

Go to your nearest specialist Commodore dealer for information about the all new Commodore 128.

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(Continued from page 25)

hardware running the type of software that I am interested in?
- Who else have you sold this type of system to and can I contact them?
- What personnel have you that understand and can identify my specific needs?
- Is the computer able to use other languages?
- Is it also a word processor?
- Are the hardware manuals written in easy to read, everyday terms?

Personally I cannot stress enough the importance of having an informed dealer, whose interest goes beyond merely selling, and who is technically knowledgeable.

Dealer support

Good dealer support is more valuable than any 10% discount on machinery.

A second set of questions to ask dealers is as follows:
- Can he provide software for evaluation? (Some dealers will have demonstration packs that you can take home and try.)
- Does the computer brand have a history of maintaining software compatibility with machines to be built in the future?
- Who are the dealers that can support me near where I live?
- Is the hardware expandable?
- Are hardware prices stable or do they reduce as the hardware ages?
- How protable is the hardware?
- How easy is the system to set up?
- Can you plug the computer into other peripherals or specialist machinery?
- Do you have a trade policy if and when we wish to upgrade?

Other options

There are a number of other helpful hints:
- Consider renting a computer first.
- A second-hand system or an old computer lying around may be sufficient to do a specific job. (At Kohimarama Primary we have an old Commodore Pet used simply for keeping track of pupils' personal record cards.)
- Consider a printer a high priority purchase. The options with a printer are endless.
- Realise and recognise that computers are an on-going cost. The cost does not stop with purchase. Once you have a computer you will think up new things for the computer to do...and the costs mount up — ask my school committee.

Security

There are two other considerations that are really self explanatory — security and protection of programmes and hardware.

These may seem obvious but a lot of people only plan for these problems after purchase.

The booklet contains other information, mainly specific to the education system, as well as a number of case studies of schools that have acquired computer systems.

This information was collated under the auspices of the Auckland Education Board and I feel the board has taken a worthy initiative in freely providing suggestions, advice and recommendations on computers for schools.

Advice like this, in such clear, direct and unbiased form, has been hard to come by.

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Hardware survey

Under-$4000 microcomputers

This month our annual hardware survey commences with a line-up of computers retailing for less than $4000.

Next month we look at the $4000-and-over machines.

If the odd machine is missing from the ranks it's because its main distributor, despite repeated promptings, neglected to respond to the survey.

Others could be missing because their more workable configurations place them in the $4000-and-over category.

The survey compilation was during December.

Acorn Electron

Processor:	6502, 2Mhz
RAM:	32K
ROM:	32K for OS, BASIC; 128K with Plus 1.
Video RAM:	No
Keyboard:	Full travel, 56 keys, no numeric. 10 programmable function keys.
Video:	RGB Colour, Video, VHF; 80 x 25 characters.
Resolution:	640 x 256, 8 colours.
Interfaces:	Cassette
Disk drives:	—
Other components:	—
Operating systems:	Proprietory
Languages:	BBC BASIC
Optional:	Pascal, COMAL, Lisp, Forth
Bundled software:	Welcome Pack
Prices:	*$695.00*
Expansions:	ROM/printer intfc $249, disk unit 315K, 3.5" $890
Applications:	Home/education

Amstrad 664

Processor:	Z80A, 4 Mhz.
RAM:	64K
ROM:	48K for OS, expandable to 8 Meg.
Video RAM:	Inclusive 16K
Keyboard:	Full travel, 77 keys, numeric and cursor pads, 10 function keys.
Video:	Monochrome or colour. 20/40 or 80 columns x 25 lines.
Resolution:	160 x 200/320 x 200/640 x 200; 20 colours.
Interfaces:	2nd drive/printer/joystick/stereo sound/data bus/centronics
Disk drives:	1 x 3" fd inclusive, 380 Kb.
Other components:	Monitor/3" disc drive/1 system disc.
Operating systems:	Amsdos/CPM 2.2
Languages:	Basic and Logo
Optional:	Pascal/Fortran/Forth/C/Cobol/CBASIC/Micro-Prolog...
Bundled software:	Dr Logo/CPM2.2 with utilities (ASM/ED/DDT, etc.)
Prices:	$1495 (green screen), $1895 (colour)
Expansions:	Printer $695, 2nd drive $595, RS 232 + software $199.
Applications:	Games/educational/programming/small business.

Amstrad CPC 464

Processor:	Z80A, 4Mhz
RAM:	64K
ROM:	48K for OS, expandable to 8 Mb.
Video RAM:	Inclusive 16K
Keyboard:	Full travel, 77 keys, numeric pad, 10 function keys, cursor pad.
Video:	Colour or monochrome, 20/40 or 80 columns x 25 lines.
Resolution:	160 x 200/320 x 200/640 x 200; 27 colours.
Interfaces:	Disc drive/centronics port/joystick/stereo sound.
Disk drives:	2 optional drives, 3" fds of 380K each.
Other components:	Datacorder and monitor inclusive.
Operating systems:	Amsdos and CPM 2.2 with disc drive.
Languages:	Locomotive Basic
Optional:	Pascal/Forth/C/Logo/Fortran/Cobol/CBASIC/etc.
Bundled software:	Starter kit
Prices:	$695 with green monitor, $1095 with colour.
Expansions:	Speech synth/light pen/RS 232/printer.
Applications:	Games/educational/small business.

Amstrad CPC 6128

Processor:	Z80A, 4 Mhz
RAM:	128Kb
ROM:	48K for DOS, OS & Basic. Expandable to 8 Megs.
Video RAM:	16K inclusive.
Keyboard:	Full travel, 77 keys, numeric and cursor pads, 10 function keys.
Video:	Colour or monochrome screen inclusive. 20/40 or 80 columns x 25 lines.
Resolution:	160 x 200/320 x 200/640 x 200; 27 colours.
Interfaces:	Extra drive/centronics/joystick/stereo/data bus.

(Continued 31)

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CACCESS29	Beachhead II	D	66.00
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CACTIV25	Great American Rd Race	T	45.95
CACTIV35	Master Of The Lamps	T	50.55
CACTIV45	Rescue On Fractulus	T	45.95
CACTIV55	Web Dimension	T	45.95
CACTIV65	Hacker	T	45.95
CACTIVIS11	H.E.R.O.	D	91.80
CACTIVIS35	H.E.R.O.	T	27.00
CACTIVIS49	Pitfall II	T	44.50
CACTIVIS59	Tour De France	T	22.00
CACTIVIS85	Mindshadow	D	99.95
CACTIVIS89	Space Shuttle	T	50.45
CADV/INT65	Robin Of Sherwood	T	45.80
CANIROG45	Slap Shot	T	41.20
CANIROG55	737 Flight Path	T	36.60
CARIOALA71	M.U.L.E.	D	68.80
CARIOLA21	Raid Over Bungeling Bay	D	59.60
CARIOLA25	Castle Of Dr. Creep	T	45.95
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CARIOLA95	Sky Fox	D	54.00
CARIOLAS85	Sky Fox	T	41.60
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CBEYOND55	Spy V's Spy II	T	45.95
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CEL/ARTS25	M.U.L.E.	T	64.09
CELECTRI15	Spy's Demise	T	45.95
CELITE35	Dukes Of Hazard	T	40.10
CELITE45	Frank Brunos Boxing	T	36.95
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CEPYX25	Impossible Mission	D	74.75
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CFIREBIR15	Elite	T	45.50
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CGILSOFT45	The Quill	D	83.15
CGREMLIN15	Thing On A Spring	T	41.95
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SACCESS35	Beachhead II	T	39.75
SACTIV45	Hacker	T	31.95
SACTIVIS15	Ghostbusters	T	49.95
SACTIVIS25	G. European Road Race	T	35.60
SACTIVIS35	H.E.R.O.	T	31.75
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RDIALOG35	Home Accounts	T	53.15
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RDOMARKS35	View To A Kill	D	58.50
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(Continued from 29)

Disk drives:	1, optional 2nd drive, 3" fds of 380Kb.
Other components:	Monitor and disc drive.
Operating systems:	Amsdos/CP/M 2.2/CP/M Plus.
Languages:	Basic and Logo
Optional:	Pascal/Forth/c/Fortran/ Cobol/C BASIC/Micro-PROLOG...
Bundled software:	Dr Logo/CP/M2.2, CP/M Plus. All utilities (ASM/ED/DDT, ...)
Prices:	$1595 (green screen), $1995 (colour)
Expansions:	ALQ printer $695, second drive $595, RS 232 + Light Pen $69, software $199.
Applications:	Business/games/education/programming.

Amstrad PCW 8256

Processor:	Z80A, 4 Mhz
RAM:	256Kb
ROM:	Kernal as boot loader.
Video RAM:	24K inclusive.
Keyboard:	Full travel, 88 keys, numeric and cursor pads, 30 function keys.
Video:	Monochrome, 90 characters x 32 lines.
Resolution:	720 x 256. Colours 27, if linked with separate colour monitor.
Interfaces:	Centronics/bus.
Disk drives:	1 x 3" 380K fd.
Other components:	Printer/monitor/drive all inclusive.
Operating systems:	CP/M Plus/2.2 Mallard Basic/Locoscript.
Languages:	Mallard Basic.
Optional:	Forth/Pascal/c/Lisp/Prolog/Fortran/Cobol/ CBasic/PL-2.
Bundled software:	Loco Script, CP/M Plus + Mallard Basic/Locoscript
Prices:	Keyboard/disc drive/NLQ printer/monitor $2495.
Expansions:	1 Mb hard disc, RS 232, Serial Interface..
Applications:	Business — typewriter alternative

Apple IIc

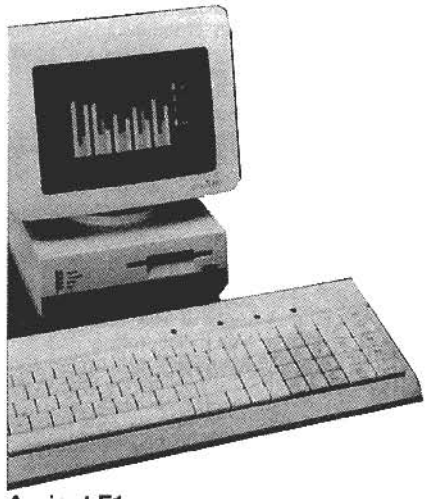
Processor:	65C02, 1 Mhz.
RAM:	128 Kb.
ROM:	16K for Basic Interpreter and System software.
Video RAM:	Inclusive 1-8K in main RAM.
Keyboard:	Full travel, 63 keys, no numeric pad, cursor control keys,
Video:	Colour, 80 columns x 24 lines.
Resolution:	192V x 560H, 16 colours.
Interfaces:	RS 232 serial, centronics parallel.
Disk drives:	1-4, 5¼" or 3½" fds, 140K or 800 Kb.
Other components:	Optional printer.
Operating systems:	ProDOS or UCSD P system or DOS 3.3.
Languages:	Applesoft Basic.
Optional:	Pascal, Logo, ProLog, Forth, Modula-2, Fortran.
Bundled software:	Introductory software (self-paced instruction).
Prices:	$2923: CPU, monitor, monitor stand, single 5¼" disk drive.
Expansions:	—
Applications:	Business, education.

Apple IIe

Processor:	65C02, 1 Mhz.
RAM:	64 Kb, 1128 Kb max.(1.125 Mb).
ROM:	16 Kb for Basic Interpreter and System software.
Video RAM:	1 — 8K included in main RAM.
Keyboard:	Full travel, 63 keys, no numeric pad, cursor control keys.
Video:	Colour, 80 columns x 24 lines.
Resolution:	192V x 560H, 16 colours.
Interfaces:	RS 232, serial, centronics parallel.
Disk drives:	1 to 8 5¼" or 3½" fds, 140 Kb or 800 Kb.
Other components:	Optional printer.
Operating systems:	ProDOS or UCSD P system or DOS 3.3.
Languages:	Applesoft Basic.
Optional:	Pascal. Logo, ProLog, Forth, Modula-2, Fortran.
Bundled software:	AppleWorks (word processor, spreadsheet, database) + Introductory (self-paced instruction).
Prices:	$3995: CPU, monitor, duo disk drive, 80 column card, AppleWorks software.
Expansions:	—
Applications:	Business, education.

Apple Macintosh

Processor:	32/16 bit Motorola 68000, 7.8336 Mhz.
RAM:	512K max.
ROM:	64K for device handling, standard user interface, operating system. Max. 128K.
Video RAM:	22K included in main RAM
Keyboard:	Full travel, standard layout, 58 keys, optional numeric pad, software mapped.
Video:	Monochrome. 3 to 42 lines, various columns, depending on font size selected.
Resolution:	512H x 342V. Black/ white.
Interfaces:	2 x RS 232/RS 422, mouse port, sound (4 voices), disk port.
Disk drives:	Up to 6. 3½" floppy or fixed disk.
Other components:	9" & 15" dot-matrix printer, 300 DPI laser printer.
Operating systems:	Proprietary, based on mouse-user interface, including graphics, fonts.
Languages:	—
Optional:	Pascal, Basic, Modula-2, C, Cobol, Neon, Forth, Prolog.
Bundled software:	MacWrite Word Processor, MacPaint Graphics, Self-paced instruction tutorials.
Prices:	$6,735: CPU, monitor, 1 x 400K disk drive, keyboard, mouse, MacWrite/MacPaint software.
Expansions:	Additional 20 MByte fixed disk, 400K floppy disk, 9" or 15" dot-matrix graphic printers, 300 DPI laser graphic printer.
Applications:	Business.



Apricot F1

Processor:	8086. 4.77 Mhz
RAM:	256K, 768 K max.
ROM:	32K for BIOS.

(Continued on page 33)

The new Amstrad Word processor-Typewriter appears to have upset our rivals.

Why spend huge amounts for an electric typewriter when for a third of the price, you can enjoy the unique advantages of a serious business word processor, typewriter and computer combination complete in one unit.

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With the 'user friendly' software of the PCW8256, word processing need be no more complicated than an electric typewriter — although as you absorb more of the fundamentals and skills, then you can progress further to take advantage of some of the most powerful word processing software available anywhere.

And the price will amaze you — just $2,495 complete. Nothing else comes near it.

From finger to keyboard to screen to disc and printer. One simple process, one plug, one amazing price.

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ADDRESS: _____

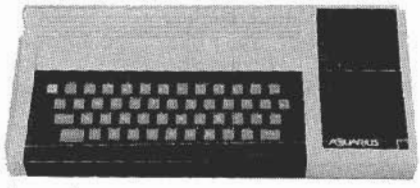
POST TO: Grandstand Computers Ltd, CPO Box 2353 Auckland.
21 Great South Road, Newmarket, Auckland. Phone: 504-033

GRANDSTAND AMSTRAD

RnA423

(Continued from page 31)

Video RAM:	Inclusive.
Keyboard:	Full travel, 92 keys, numeric pad, 8 function keys.
Video:	Mono or colour. 80 characters x 25 lines.
Resolution:	640 x 256, 320 x 256. 4 or 16 colours.
Interfaces:	Serial RS 232, centronics parallel.
Disk drives:	one fd, 3.5", 720Kb.
Other components:	—.
Operating systems:	MSDOS.
Languages:	GWBasic.
Optional:	All MSDOS.
Bundled software:	ASYNC Comms, Acitivity, Utilities
Prices:	$3895 for processor, keyboard, software.
Expansions:	—.
Applications:	Business/education.

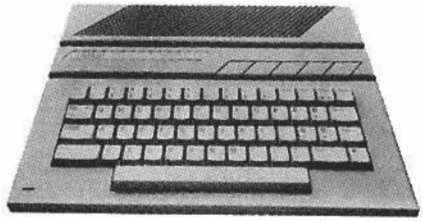


Aquarius

Processor:	280A, 3.579 Mhz
RAM:	4K, 34K max.
ROM:	10K for Basic, OS & character set.
Video RAM:	Inclusive 2K.
Keyboard:	Rubber, 49 keys, no numeric pad. Single key function entry.
Video:	Colour RF output. 40 characters x 24 lines.
Resolution:	80 x 72. 16 colours.
Interfaces:	Cassette port, printer/ serial port, cartridge slot.
Disk drives:	—
Other components:	Printer, cassette recorder, ROM cartridges optional.
Operating systems:	Basic
Languages:	Basic
Optional:	Logo
Bundled software:	None
Prices:	$99, including power supply and manuals.
Expansions:	ROM cartridge slots and paddles.
Applications:	Home.

Atari 130 XE

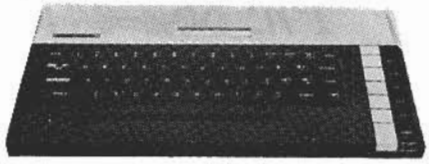
Processor:	6502, 2 Mhz.
RAM:	128K.
ROM:	24K for Basic & OS.
Video RAM:	Inclusive.



Keyboard:	Full travel, 62 keys. Numeric pad optional. 6 function keys.
Video:	Mono or colour. 40 character x 24 lines.
Resolution:	320 x 192; 256 colours.
Interfaces:	Atari serial. TV RF. 2 joystick ports.
Disk drives:	Fd 5¼", 127 Kb. Optional.
Other components:	Optional.
Operating systems:	Atari.
Languages:	Basic.
Optional:	See 800 XL.
Bundled software:	—
Prices:	$659.
Expansions:	—
Applications:	—

Atari 800 XL

Processor:	6502. 2 Mhz.
RAM:	64K.
ROM:	24K for Basic & OS.
Video RAM:	Inclusive.
Keyboard:	Full travel, 62 keys. No numeric pad. 6 function keys.
Video:	Mono and colour. 40 characters x 24 lines.
Resolution:	320 x 192. 256 colours.
Interfaces:	Atari serial, TV RF, 2 joystick ports. ROM cartridge slot.
Disk drives:	Optional. 5¼" fd, 127 Kb.
Other components:	Printer, plotter, touch tablet, datasette, lightpen. All optional.
Operating systems:	Atari.
Languages:	Basic.
Optional:	Logo, Pilot, C Forth, Action, Assembler, Pascal, Lisp, Microsoft Basic.
Bundled software:	—
Prices:	$439.
Expansions:	Disc drives.
Applications:	Home.



BBC Micro. Model B

Processor:	6502. 2 Mhz.
RAM:	32K. B-Plus has 128K board.
ROM:	32K for Basic & OS. Maximum 16 x 16K ROMs.
Video RAM:	Inclusive.
Keyboard:	Full travel, 73 keys, no numeric pad. 10 function keys plus four cursor controls.
Video:	RGB, PAL & RF. 80 or 40 columns x 24 or 32 lines.
Resolution:	640 x 256. To 16 colours.
Interfaces:	Parallel printer, user port, 1 Mhz bus, Tube, RS 423, cassette, video.
Disk drives:	Up to 4 fds plus hd. 3½" or 5¼". Max. fd is 800K. Hd is 96 Mb.
Other components:	Optional.
Operating systems:	Acorn.
Languages:	Basic.
Optional:	Lisp, Forth, Logo, Pascal, BCPL, Cobol, Fortran, Microprolog, C.
Bundled software:	Welcome disc — 3 programmes.
Prices:	$1295.
Expansions:	$1495 with disc drive interface. BBC-Plus (64K) $1939.
Applications:	Home, education, business.

Cat Computer

Processor:	6502A. 2 Mhz.
RAM:	64 K.
ROM:	32K for OS, language & inbuilt terminal s'ware.
Video RAM:	Inclusive.
Keyboard:	Full travel, 81 keys, 8 (x3) function keys, numeric pad, cursors, rubout etc.
Video:	RGB (with colour defeat) and optional RF adaptor. 40 or 80 columns x 24 lines.
Resolution:	560 x 192 (6 colours), 280 x 192 bit image graphics (8 colours).
Interfaces:	Cassette, joysticks, printer, RS 232, disc drive, video, RGB.
Disk drives:	Optional 5¼" fds of 140Kb.
Other components:	Optional.
Operating systems:	Apple DOS 3.3.
Languages:	Microsoft Basic Extended.
Optional:	Apple Basic, Pascal, Logo.
Bundled software:	None.

(Continued 35)

Pacific Computers

(Retail Division of Parsonage Electronics)

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Including:

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Full customer support:

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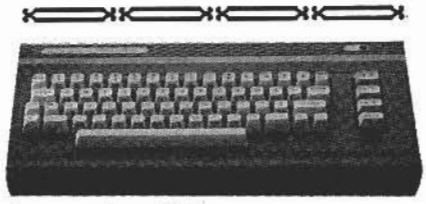
Ph: 562-441

MAIL ENQUIRIES: *P.O. Box 54-069, Bucklands Beach Auckland*

(Continued from page 33)

Prices:	Cat, single drive, green screen plus software $1995.
Expansions:	Optional.
Applications:	Business, education, home.

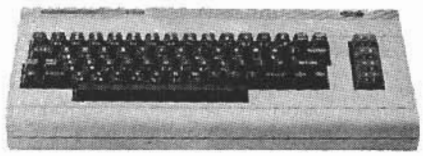


Commodore C16

Processor:	7501, .89 - 1.76 Mhz.
RAM:	16K, to 64K max.
ROM:	32K for Operating system and Basic interpreter.
Video RAM:	Inclusive.
Keyboard:	Full travel, 66 keys, no numeric pad, 8 function keys plus Help, Escape.
Video:	None standard. Display is 40 columns, x 25 lines.
Resolution:	320 x 200, 160 x 200. 121 colours.
Interfaces:	Serial, 2 joysticks, cartridge, monitor o/p, RF, cassette.
Disk drives:	Optional. 5¼". 170 Kb.
Other components:	Optional.
Operating systems:	CBM Kernal.
Languages:	BASIC 3.5.
Optional:	—
Bundled software:	—
Prices:	$295.
Expansions:	Optional.
Applications:	Games, education.

Commodore C64

Processor:	6510. 0.89 to 1.76 Mhz.
RAM:	64K, 38K random.
ROM:	20K, for Operating systems and Basic interpreter.
Video RAM:	Inclusive.
Keyboard:	Full travel, 66 keys, numeric pad optional. 8 function keys.
Video:	None standard. Displays 40 columns x 25 lines.
Resolution:	320 x 200, 160 x 200. 16 colours.
Interfaces:	RS232C, serial, cartridge, 2 joysticks, datasette, monitor, RF.
Disk drives:	Optional, 5¼" fds, 170Kb.



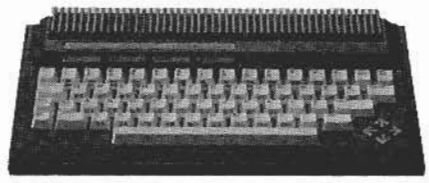
Other components:	Optional printers, datasette, joystick, modem, lightpen.
Operating systems:	CBM.
Languages:	BASIC.
Optional:	Pascal, Logo, Assembler, Cp/m.
Bundled software:	—
Prices:	$495.
Expansions:	—
Applications:	Games/education/small business.

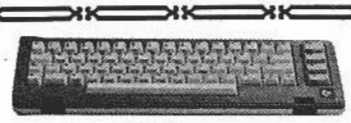
Commodore C128

Processor:	8502, 6510, 280A. 1 — 4 Mhz.
RAM:	128K. 512K max.
ROM:	48K for OS, character sets, language.
Video RAM:	Inclusive.
Keyboard:	Full travel, 92 keys, numeric pad, 8 function keys and 6 cursor keys. Help key, 40/80 column key, no scroll and more.
Video:	None standard. 128 mode — 40 or 80 columns.
Resolution:	160 x 200 min, 640 x 200 max.
Interfaces:	User cassette, RF, audio, monitor, RGB Serial, 2 joystick, cartridge.
Disk drives:	Optional, up to five 5¼" fds, 360 Kbs.
Other components:	Printers, datasette, joystick, modem optional.
Operating systems:	CBM & CP/M.
Languages:	BASIC 7.0, BASIC 2.0, Machine Code Monitor.
Optional:	—
Bundled software:	—
Prices:	$995.
Expansions:	—
Applications:	Business/games/education.

Commodore Plus 4

Processor:	7501, 0.89 - 1.76 Mhz.
RAM:	64K.
ROM:	32K for OS and Basic interpreter.
Video RAM:	Inclusive.
Keyboard:	Full travel, 66 keys, no numeric pad, 8 function keys and Help, Escape, separate cursors.
Video:	None standard. 40 columns, x 25 lines.
Resolution:	320 x 200, 160 x 200. 121 colours.
Interfaces:	Serial, User Port, 2 x joystick, cartridge, monitor, RF, cassette.
Disk drives:	Optional. 5¼". 170 Kb.
Other components:	Printers, datasette, joysticks optional.
Operating systems:	CBM.
Languages:	BASIC 3.5.
Optional:	—
Bundled software:	Graphics, spreadsheet, word processing, file management.
Prices:	$495.
Expansions:	—
Applications:	Business, education.





Commodore SX64

Processor:	6510. 0.89 to 1.76.
RAM:	64K, 38K random.
ROM:	20K for OS and BASIC interpreter.
Video RAM:	Inclusive.
Keyboard:	Full travel, 66 keys, no numeric pad, 4 (x2) function keys.
Video:	Colour. 40 columns x 25 lines.
Resolution:	320 x 200, 160 x 200. 16 colours.
Interfaces:	RS 232, serial, cartridge, joysticks.
Disk drives:	Standard 1 x 5¼" fd of 170 Kb.
Other components:	Printers, joysticks, modems optional.
Operating systems:	CBM.
Languages:	BASIC.
Optional:	Pascal, Logo, Assembler, CP/M.
Bundled software:	The Manager, Easy Script, Easy Mail, Disk Bonus Pack. No charge — W/P, Database.
Prices:	$2295.
Expansions:	—
Applications:	Education, small business.

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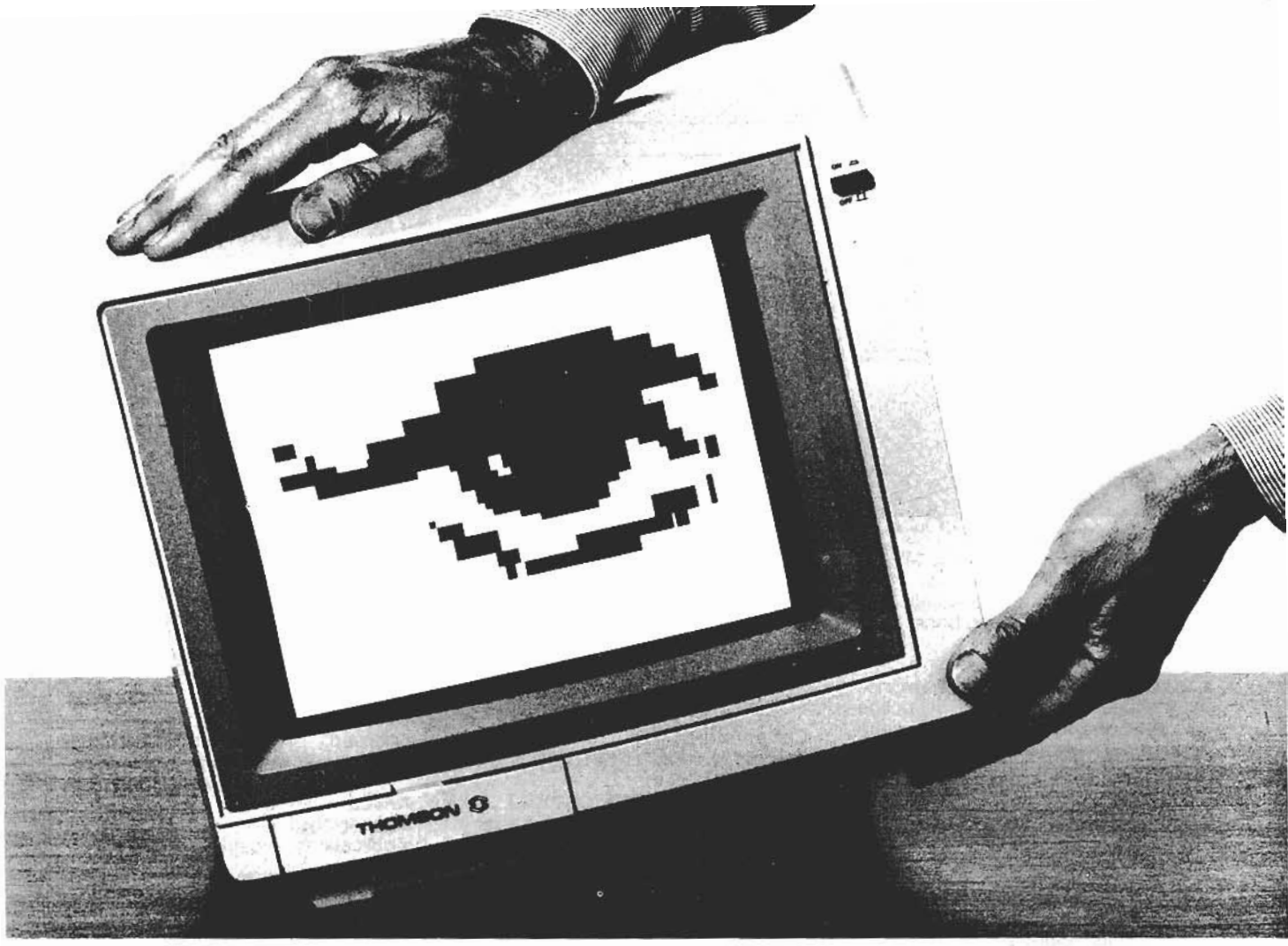

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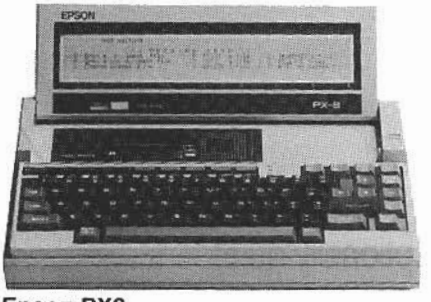
45 Normanby Road, Mt Eden, Auckland 3. Ph (09) 600-687.

CLAUDE 2832

(Continued from page 35)

DSE-Multitech

Processor:	8088. 4.77 Mhz.
RAM:	128 K and 256K versions. Max. 512K.
ROM:	8K for Bios and diagnostics. Optional max. 32K..
Video RAM:	Inclusive.
Keyboard:	Full travel, 84 keys, 12 key numeric pad, 10 function keys.
Video:	Mono, colour, RGB. 80 or 40 columns x 25 lines.
Resolution:	640 x 200, 320 x 200. 16 colours.
Interfaces:	Parallel, centronics, RS 232 serial, joystick port, clock.
Disk drives:	One or dual fds of 360Kb, 5¼". Hard disc 10Mb.
Other components:	Optional
Operating systems:	MS-DOS 2.11.
Languages:	As for IBM.
Optional:	—
Bundled software:	Easyword.
Prices:	$1995 for 128K ram, single disc; $2495 — 256K ram dual fd; $3995 — 512K ram 10Mb hd version.
Expansions:	As above.
Applications:	Home, education, business.



Epson PX8

Processor:	Z80
RAM:	64 Kb. Extra 120K as Ram disk.
ROM:	Max. 64Kb for extra software..
Video RAM:	6Kb.
Keyboard:	Full travel, 72 keys, numeric pad, 5 function keys and extra edit keys.
Video:	Flip-up LCD. 80 columns x 8.
Resolution:	480 x 64.
Interfaces:	RS 232, Serial (2 interfaces).
Disk drives:	Optional dual 5¼" 320K each, mains; or 1 x 3½" 320K, battery..
Other components:	Real time clock, microcassette incl.
Operating systems:	CP/M.
Languages:	Microsoft Basic.
Optional:	—
Bundled software:	CP/M, Basic, Wordstar, Portable calc, Scheduler, CP/M utilities.
Prices:	$2377 + $238 for above software.
Expansions:	Printer $900; disc unit (120K) $1000.
Applications:	Business-in-field.

HCP 1000 (IBM clone by TSE, Taiwan)

Processor:	8088, 4.77 Mhz.
RAM:	256K; max. 640K.
ROM:	8K for Bios; max. 128K.
Video RAM:	Inclusive.
Keyboard:	Full travel, 86 keys, numeric pad, 10 function keys, edit keys.
Video:	Monochrome (standard) or colour, 80 columns x 25 lines.
Resolution:	16 colours, 600 x 300; mono 720 x 346.
Interfaces:	Parallel port std, optional serial ports.
Disk drives:	2 x 5¼" fds, 360K each.
Other components:	None standard, printer optional.
Operating systems:	MS-DOS, PC-DOS.
Languages:	As for IBM.
Optional:	—
Bundled software:	None.
Prices:	256K RAM computer, 2 fds, mono screen, keyboard $2400. 10Mb hard disc $2500.
Expansions:	—
Applications:	Business.

Kaypro 2X

Processor:	Z80, 4 Mhz.
RAM:	64K.
ROM:	2K, bootstrap.
Video RAM:	Inclusive.
Keyboard:	Full travel, 72 keys, numeric pad, 18 function keys, cursor keys.
Video:	Monochrome (green) built-in, 80 columns x 25 lines.
Resolution:	100 x 160. Monochrome.
Interfaces:	Serial, parallel.
Disk drives:	Two 5¼", 400K each, fds..
Other components:	Optional.
Operating systems:	CP/M 2.2.
Languages:	MBasic.
Optional:	Most CP/M languages.
Bundled software:	Wordstar, Mailmerge, Calcstar, Infostar, MBasic.
Prices:	$3995.00 for all above.
Expansions:	—
Applications:	Business & word processing.

Microbee

Processor:	Z80A, 3.375 Mhz.
RAM:	64K; max. 128K.
ROM:	Up to 80K on PC85 firmware. 4K character set.
Video RAM:	4K.
Keyboard:	60 key full travel. No function keys or numeric pad. Edit keys.
Video:	Amber mono, TV. 64 to 80 columns x 16 to 24 lines.
Resolution:	512 x 526. Colour option.
Interfaces:	Programmable 8-bit I/O, parallel, RS 232, cassette, video.
Disk drives:	3½", 400K single/dual fds. 10 Mg hd option.
Other components:	Optional.
Operating systems:	CP/M 2.2.
Languages:	CP/M options; Microsoft Basic, Turbo Pascal...
Optional:	As above.
Bundled software:	None.
Prices:	64K 1-drive $1750.
Expansions:	As above.
Applications:	Australian-sourced educational programmes, and small business.

Poly 2 Learning System

Processor:	6809/Z80A dual. 4 Mhz.
RAM:	128 Kbyte.
ROM:	20 Kbyte for Basic O system..
Video RAM:	Inclusive.
Keyboard:	Full travel, 72 keys, numeric pad, editing keys.
Video:	Colour. 40, 60 and 80 columns x 24 lines.
Resolution:	240 x 204, 480 x 204.
Interfaces:	Centronics standard, RS 232 C optional.

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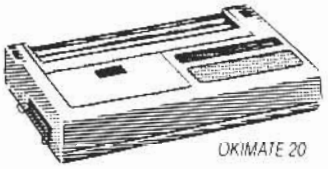
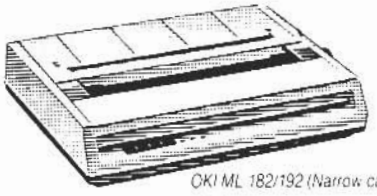
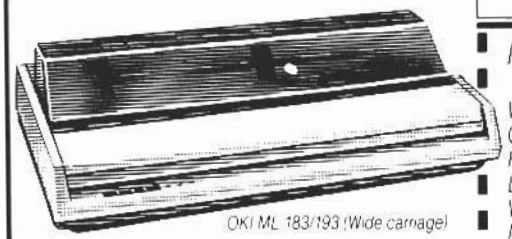


OKIMATE 20



OKI ML 182/192 (Narrow carriage)



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Hi speed	☐	☐
Low speed	☐	☐
Wide carriage	☐	☐
Narrow carriage	☐	☐

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Address: _____

_____

_____ *phone:* _____

PROMOTUS 352 2

INDEX TO BITS & BYTES

Volume Three: Sept. '84 — Aug. '85

The following index to the third volume of Bits and Bytes alphabetically lists topics with their issue number first and then the page number.

For example, accounting packages are in issue number 8, beginning on page 31.

The key to Volume Three issue numbers is as follows:
1984: September's issue is No. 1, October #2, November #3, December #4.
1985: January/February #5, March #6, April #7, May #8, June #9, July #10, August #11.

Back issues are still available — simply send an order to the publisher with enclosed payment of $2.00 per issue.

Our thanks to Gerald Fowler, a long-time subscriber to Bits and Bytes and professional indexer, who prepared this index.

Previous indexes are in earlier February issues.

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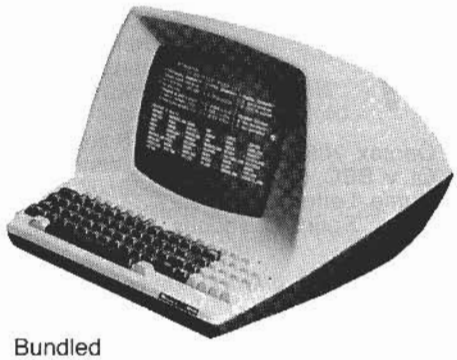
Disk drives: Optional one, two or four: 600 Kb per 8" drive.
Other components: Optional
Operating systems: Polysystem — alternatively CP/M.
Languages: Basic.
Optional: Pascal, Logo, Pilot, Assembler.
Bundled software: Operating system, basic interpreter, 42 utilities.
Prices: $2950 Poly 2.
Expansions: —
Applications: Education.

President Jr

Processor: 8088, 4.77 Mhz.
RAM: 256K; max. 640K.
ROM: 8K for bootstrap. Max. 32K.
Video RAM: Inclusive.
Keyboard: Full travel, 83 keys, numeric pad, 10 function keys, cursor keys.
Video: Optional RGB colour, composite & monochrome. 40 or 80 columns x 25 lines.
Resolution: 320 x 200, 640 x 200. 16 colours.
Interfaces: Parallel, RS 232, disk controller, game I/O.
Disk drives: One built-in, 5¼", 360K formatted.
Other components: Optional.
Operating systems: MS-DOS 2.11.
Languages: GW Basic.
Optional: All MS-DOS languages.
Bundled software: Open Access.
Prices: $2750.00 for above.
Expansions: —
Applications: Small business, home.

Proteus

Processor: 6809/Z80A, 4 Mhz
RAM: 64 Kbyte.
ROM: 4 Kbytes for bootstrap.
Video RAM: Inclusive.
Keyboard: Uses Learseagler ADMII terminal.
Video: Mono. 80 columns x 24lines.
Resolution: —
Interfaces: —
Disk drives: 8", 630Kb per disc.
Other components: —
Operating systems: Flex, CP/M, Polysystem.
Languages: —
Optional: Basic Cobol/Fortran/c/PLI/Pascal/Assembler (6809-280).



Bundled software: No
Prices: $2500 (+ tax) single drive, $3500 (+ tax) dual drive.
Expansions: —
Applications: Business.

Remarkable PC and XT

Processor: 8086, 8087 (optional). 4.77 Mhz.
RAM: 256K, max 640K.
ROM: IBM compatible.
Video RAM: —
Keyboard: Full travel, 83 keys, numeric pad, 10 function keys, 9 editing keys.
Video: Choice, 80 x 25.
Resolution: Medium — standard, high — optional, 16 colours.
Interfaces: Parallel port, 8 expansion slots.
Disk drives: 2 x 5¼" fds of 360K each.
Other components: 130 watt power supply.
Operating systems: MS-DOS.
Languages: —
Optional: —
Bundled software: —
Prices: $2995, with 2 fds (screen extra). XT with 20Mb hard disc, $5695.
Expansions: —
Applications: Business.

Sanyo MBC 550, 555-2, 555-T

Processor: 8088,3.6 Mhz
RAM: 128K. Max 512K
ROM: 8K (IPL/CG)
Video RAM: 48K, including 16K of main RAM
Keyboard: Full travel, 84 keys, numeric pad, 10 function & 3 edit keys
Video: Optional mono and colour. 80 columns x 25 lines.
Resolution: 640 x 200x
Interfaces: Centronics parallel printer interface; RGB & video composite port.
Disk drives: 5¼".550 has 1 fd x

	160K; 555-2 has 2 fds x 360K; 555-T has 2 x 720K.
Other components:	Optional.
Operating systems:	MS-DOS 2.57
Languages:	Basic (Sanyo)
Optional:	Most others.
Bundled software:	Wordstar, Calcstar, Mailmerge, Spelstar, Infostar.
Prices:	550 (incl. monitor) $2290; 555-2 $2995; 555-T $3795.
Expansions:	Optional.
Applications:	Home, education, small business.

Sanyo MBC 885

Processor:	8088-2. 8.00/4.77 Mhz (switchable).
RAM:	256Kb RAM. Max. is 640K RAM.
ROM:	8K for character generator.
Video RAM:	Inclusive.
Keyboard:	Sculpture/type, 84 keys, 10 function keys, 5 editing keys.
Video:	None. 80 columns x 25 lines.
Resolution:	—
Interfaces:	Parallel printer port, RGB monitor connector.
Disk drives:	Dual 360 K, 5¼" fds.
Other components:	—
Operating systems:	MS-DOS.
Languages:	GWBasic.
Optional:	Most others.
Bundled software:	Wordstar 2000.
Prices:	$3995 as above.
Expansions:	—
Applications:	Business/education.

Sega SC3000-H

Processor:	Z80A 3.8 Mhz.
RAM:	64K.
ROM:	32K for OS.
Video RAM:	16K video ROM inclusive.
Keyboard:	Full travel, 64 keys, cursor pad.
Video:	Tv or monochrome/colour monitor. 38 characters x 24 lines.
Resolution:	256 x 192, 16 colours.
Interfaces:	Video port, plotter/printer port, tape in/out.
Disk drives:	1 optional 3", 380 Kb.
Other components:	Printer, tape, disc drive.
Operating systems:	Basic.
Languages:	Basic.
Optional:	Logo.
Bundled software:	—
Prices:	$199.
Expansions:	ROM cartridges.
Applications:	Games, education, small business, programming.

Sharp MZ 800

Processor:	Z80A, 3.5 Mhz.
RAM:	80K.
ROM:	16K for boot monitor & character generator.
Video RAM:	16K from main RAM; extra 16K optional.
Keyboard:	Full travel, 5 function keys (shiftable), cursor pad, no numeric pad, edit keys.
Video:	Separate, RGB & composite video interface, colour or mono, 40-80 columns.
Resolution:	16 colours.
Interfaces:	Video, bus for disc drive and RS232C, printer, 2 joystick ports, tape.
Disk drives:	Optional, 3½" or 5¼", 120K or 320K.
Other components:	Room for cassette & plotter.
Operating systems:	CP/M 80 card option; plus Sharp OS.
Languages:	Basic (will run MZ700 software).
Optional:	Pascal, Logo, and others.
Bundled software:	—
Prices:	February release.
Expansions:	No RAM upgrade, otherwise as above.
Applications:	Home.

Sigma PC

Processor:	Intel 8086, 4.77 Mhz.
RAM:	128K — 512K. Upgradable to 640K RAM.
ROM:	16K.
Video RAM:	—
Keyboard:	IBM-like, separate keyboard, 10 function keys, numeric pad.
Video:	80 x 25 lines, colour or mono.
Resolution:	—
Interfaces:	RS 232, centronics standard.
Disk drives:	360 Kb, 5¼" fds. Hd options.
Other components:	Optional.
Operating systems:	MS-DOS.
Languages:	Basic.
Optional:	IBM abilities.
Bundled software:	—
Prices:	$2490 for single fd and mono screen. $2990 for 2 fds.
Expansions:	To hard disc.
Applications:	Business.

Sinclair QL

Processor:	Motorola 68008, 8049 co-processor; 7.5 Mhz.
RAM:	128K; max. 1 Mgb.
ROM:	128K.
Video RAM:	Inclusive.
Keyboard:	Full travel, over membrane, 65 keys, 5(x2) function keys, no numeric pad, edit keys.
Video:	Modes selectable up to 85 columns x 25 lines. Colour or mono.
Resolution:	512 x 256, 4 colours; 256 x 256, 8 colours.
Interfaces:	2 RS 232C, RGB monitor, UHF TV, ROM cartridge, 2 network, RAM expansion, microdrive expansion, power input, 2 joystick ports.
Disk drives:	2 built-in 100K microdrives (continuous tape).
Other components:	Optional.
Operating systems:	Sinclair QDOS (multi-tasking).
Languages:	Super Basic & Turtle Graphics.
Optional:	C, 68000 assembler, BCPL, APL, Pascal, Fortran, Logo, Prolog.
Bundled software:	Psion's Quill W/P, Abacus s'sheet, Archive database, Easel graphics.
Prices:	$995 for 128K RAM version above.
Expansions:	External disc drives promised.
Applications:	Home, business (incorporated in Computer Phone) and education.

Sinclair Spectrum & Spectrum Plus

Processor:	Z80A, 3.25 Mhz.
RAM:	16 - 48K.
ROM:	16K.
Video RAM:	Inclusive.
Keyboard:	Spectrum — rubber; S.Plus — full travel, 50 keys, no numeric pad or function keys, has edit and cursor keys.
Video:	Mono/colour, 32 columns x 24 lines.
Resolution:	256 x 190, 6 colours plus b/w, and shades programmable.

(Continued on page 46)

(Continued from page 45)

Interfaces:	Interface 2 ($96) joysticks, ROM cartridgfe slots; Interface 1 ($249) RS 232C, network, microdrives; memory upgrades, parallel printer, videotex adapter, I/O boards...
Disk drives:	100K microdrives optional.
Other components:	Above options.
Operating systems:	Proprietary.
Languages:	Basic.
Optional:	Forth, Microprolog, Logo, assemblers.
Bundled software:	'Special price' packs, including Interface I or 2, offered.
Prices:	16K version $299, 48K version $480, S.Plus $599.
Expansions:	See 'Interfaces'.
Applications:	Home, education.

Spectravideo SV 328 Business Pack

Processor:	Z80A, 3.6 Mhz.
RAM:	64 Kb. 128K max.
ROM:	32 Kb, for extended Microsoft Basic.
Video RAM:	16 Kb.
Keyboard:	Full travel, 89 keys, numeric pad, 5(x2) function keys, plus edit keys.
Video:	Monochrome, colour, TV. 40/80 columns.
Resolution:	256 x 192, 16 colours.
Interfaces:	Parallel printer.
Disk drives:	Standard 2 x 320 Kb, 5¼"; optional 1 x 10 Mb.
Other components:	Optional.
Operating systems:	CP/M.
Languages:	Extended Microsoft Basic.
Optional:	Pascal etc Under CP/M.
Bundled software:	Small business accounts, invoicing, quotations, debtors, inventory, Wordstar, Mailmerge, Calcstar, Datastar, Reportstar.
Prices:	$3995. Computer, disk drives, bundled software, 80 cps dot matrix printer, monochrome monitor.
Expansions:	—
Applications:	Small business.

Spectravideo SV 728

Processor:	Z80A, 3.6 Mhz.
RAM:	64 Kb. 128K max.
ROM:	32 Kb for MSX, Microsoft Basic.
Video RAM:	16 Kb.
Keyboard:	Full travel, 90 keys, 5(x2) function keys, numeric pad, & edit keys.
Video:	Monochrome, colour or Tv. 40 columns (80 optional).
Resolution:	256 x 192, 16 colours.
Interfaces:	For disk drive, datasette, 2 joysticks, parallel printer, expansion slot.
Disk drives:	None standard.Optional 5¼", 320 Kb formatted.
Other components:	Optional.
Operating systems:	MSX-DOS, CP/M with disk drive.
Languages:	MSX, extended Microsoft Basic.
Optional:	Pascal etc Under CP/M.
Bundled software:	None.
Prices:	$695. Computer, power supply, instruction manual, Tv cable.
Expansions:	—
Applications:	Home, education.

Spectravideo SV 738 X'Press

Processor:	Z80A, 3.6 Mhz.
RAM:	64 Kb. 128K max.
ROM:	56 Kb of which 32 Kb – MSX Basic, 8 Kb = RS232, 16K = disk drive.
Video RAM:	16 Kb.
Keyboard:	Full travel, 73 keys, 5x2 function keys, no numeric pad, edit keys.
Video:	Monochrome, colour, Tv. 40/80 columns.
Resolution:	256 x 192, 16 colours.
Interfaces:	Datasette, parallel printer, external disk, expansion slot, 2 x joysticks, RS232.
Disk drives:	1 x 3½", 360 Kb standard. 2nd fd optional, as is 5¼" 320K fd.

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  — Two 360k Disk drives — 80 column printer

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- *The T.S.C. HIRE PURCHASE system allows multiple vendor analysis.*
- The T.S.C. HIRE PURCHASE system provides calculation of Penalty Interest.
- The T.S.C. HIRE PURCHASE system provides calculation of rebatable interest by rule 78.
- The T.S.C. HIRE PURCHASE system provides individual reports on each contract.
- The T.S.C. HIRE PURCHASE system gives full analysis by vendor
- The T.S.C. HIRE PURCHASE system reports on each contract — current debt — paid to date — balance owing — rebatable interest — last pay date —overdue amount — days overdue — overdue date.
- The T.S.C. HIRE PURCHASE system provides a full trial balance reporting —split by vendor — total contracts —total paid —total new loans for month —total amount financed —total interest — total booking fees — total transactions, receipts/rebates/journal+/journal-/penalty

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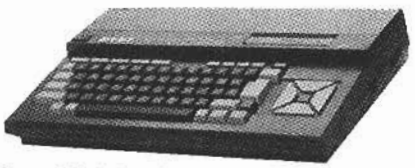
Other components:	Carry case included.
Operating systems:	MSX-DOS, CP/M.
Languages:	MSX, extended Microsoft Basic.
Optional:	Pascal etc under CP/M.
Bundled software:	Simple spreadsheet, memo writer, simple database, scheduler.
Prices:	$1195. Computer, 360 Kb disk drive, carry case, bundled software, built-in 80 col, printer interface, RS232 interface.
Expansions:	—
Applications:	Home, education, small business.



Sony Hit-bit MSX (75P)

Processor:	Z80A, 3.579 Mhz.
RAM:	64K.
ROM:	32K for MSX Basic.
Video RAM:	16K separate.
Keyboard:	74 full travel keys, 5(x2) function keys, 8 edit keys, cursor pad, no numeric pad.
Video:	Any TV, text up to 40 columns x 24 lines.
Resolution:	256 x 192, 16 colours.
Interfaces:	Built-in for any TV, cassette recorder, printer.
Disk drives:	Optional 3½" single fd of 500K.
Other components:	Supplied are TV cable, cassette cable, selector switch, and 2 manuals. Colour plotter optional.
Operating systems:	Proprietary.
Languages:	MSX Basic.
Optional:	—
Bundled software:	—
Prices:	$895.
Expansions:	—
Applications:	Home

Sord IS-IIC

Processor:	Z80A, 3.6 Mhz.
RAM:	80K, max. 112K.
ROM:	72K for system s'ware: W/p, comms, diary etc. Max. ROM 104K.
Video RAM:	Inclusive.
Keyboard:	Full travel, 70 keys, numeric pad optional (with extra function keys), six function keys.
Video:	LCD. 80 columns x 25 lines.
Resolution:	640 x 200. One colour.
Interfaces:	Standard I/O x 3, RS 232, Centr. port, ROM-RAM I/O, micro-disc drive, modem port.
Disk drives:	Optional external 3½", 132K drive.
Other components:	Optional 40 col. thermal printer.
Operating systems:	Sord.
Languages:	Basic.
Optional:	—
Bundled software:	W/p, Comms, Calc, Diary & notebook.
Prices:	$2800.
Expansions:	Fully expanded (with fd drive) $4200.
Applications:	Business portable.

Tandy Colour Computer 2

Processor:	5809E, 0.894 Mhz.
RAM:	64K.
ROM:	16K, for boot, extended colour Basic.
Video RAM:	Inclusive.
Keyboard:	Full travel, 53 keys. No numeric pad or dedicated function keys.
Video:	None standard; mono and colour options. 32 columns x 16 lines.
Resolution:	256 x 192, 8 colours.
Interfaces:	For cassettes 2 joysticks, RS 232C, TV.
Disk drives:	Optional, up to 2 x 5¼" fd, 153K each.
Other components:	Optional.
Operating systems:	Basic; CP/M optional.
Languages:	Basic.
Optional:	Logo, Pascal, C, Basic-09.
Bundled software:	None.
Prices:	$795.
Expansions:	Numerous options.
Applications:	Home, education.

Tandy 100

Processor:	80C85. 2.4 Mhz.
RAM:	24K; max. 32K.
ROM:	32K, for boot, Basic, W/p, database, communications.

(Continued on page 48)

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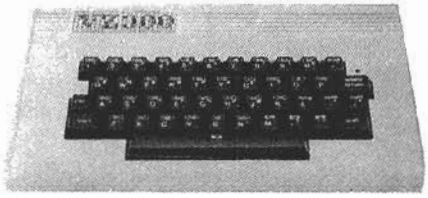
(Continued from page 47)

Video RAM:	Inclusive.
Keyboard:	Full travel, 56 keys, numeric pad, 8 function keys and 4 command keys.
Video:	LCD. 40 characters x 8 lines.
Resolution:	240 x 64.
Interfaces:	RS 232, centronics, BCR, 6v DC, phone, cassette, bus.
Disk drives:	3½", 100K fd optional.
Other components:	Optional.
Operating systems:	Transparent.
Languages:	Basic.
Optional:	—
Bundled software:	As for ROM.
Prices:	$1965 for 24K version.
Expansions:	Disc drives.
Applications:	Business.

Tandy 200

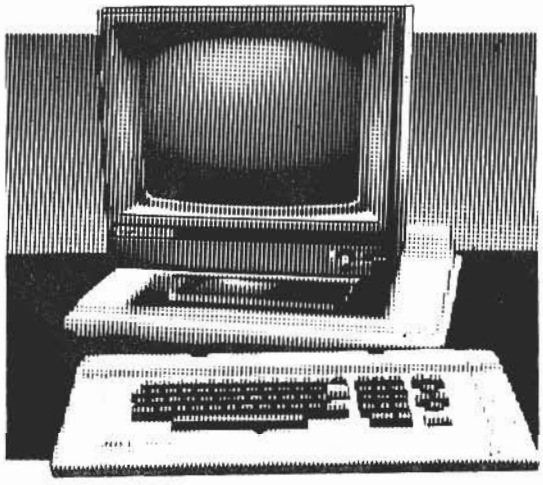
Processor:	80C85, 2.4 Mhz.
RAM:	24K; max. 72K.
ROM:	72K for boot, Basic, W/p, spreadsheet, database, telecom. Max. 104K.
Video RAM:	Inclusive.
Keyboard:	Full travel, 56 keys, numeric pad, 8 function keys, 4 command keys.
Video:	LCD. 40 columns x 16 lines.
Resolution:	240 x 128. 1 colour.
Interfaces:	RS 232, parallel, phone, cassette, BCR, 6v DC, Bus.
Disk drives:	Optional 3½", 100K.
Other components:	Optional.
Operating systems:	Transparent.
Languages:	Basic.
Optional:	—
Bundled software:	As for ROM.
Prices:	$2810 for 24K version.
Expansions:	Available.
Applications:	Business.

VZ-300



Processor:	Z80A, 3.579 Mhz.
RAM:	18K; max. 68K.
ROM:	16K for Microsoft Basic.
Video RAM:	2K of standard RAM.
Keyboard:	Full travel, 46 keys, single key function entry, 4 edit keys and cursor keys.
Video:	Mono & colour RF additional. 32 columns x 16 lines.
Resolution:	128 x 64 (8 colours), 64 x 32 (9 colours).
Interfaces:	For video, cassette, printer, I/O port.
Disk drives:	Optional 5¼" fds, 80K. Two.
Other components:	Optional, incl. RAM, light pen.
Operating systems:	Disc Basic.
Languages:	Microsoft Basic.
Optional:	—
Bundled software:	None.
Prices:	$299 for VZ-300.

BREAKING BARRIERS



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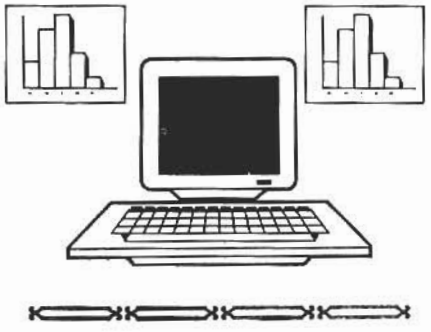
Ph 795453

Expansions: $799 for VZ-300 and one disc drive.
Applications: Home.

Yamaha CX5M Music Computer

Processor:	Z80A, 3.579 Mhz.
RAM:	32K.
ROM:	32K.
Video RAM:	Inclusive 4K.
Keyboard:	Typewriter style, 73 keys, also piano style 49 keys. 5 (x2) function keys, 5 edit keys.
Video:	40 x 24 character/lines.
Resolution:	256 x 192, 16 colours.
Interfaces:	TV, cassette, digital drum machine and synthesisers port, sequencers, tone generators, MSX printer port, sound and video.
Disk drives:	—
Other components:	Optional.
Operating systems:	Proprietary.
Languages:	MSX-Basic.
Optional:	Music peripherals. DX7 Voicing programme.
Bundled software:	The Music Composer package.
Prices:	$1995.
Expansions:	See interfaces.
Applications:	Music composition, MSX entertainment.



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Printer Utility

By William Mackay

This machine code program will allow listings to be made on any printer connected to the Commodore with a Centronics interface on the user port. The program turns all control characters into their hexidecimal number surrounded by brackets (see the listing demo), allowing listings to be made which don't confuse the printer or the reader.

Enter the program, making extra sure you don't make mistakes in the REM statements, and save it. Then run it and follow the instructions. When you use SYS to activate it, you will be given an open and CMD statement, to which the computer will react as normal. Programs will be listed in upper and lower case, with all control characters (except CR) converted.

If you have a Commodore printer, these POKEs will allow you to print listings with control characters converted to character strings:

POKE 53039,0: POKE 53013,76: POKE 53014,202: POKE 53016,241: SYS 52730

However, upper case will be converted to lower case and vice versa.

Once you have the program in memory, you should make a copy with a monitor. The program occupies memory locations CDFO to CFFF. If you would like the program on tape, send $4 and a blank cassette to:) William Mackay, 91 Songer St, Stoke, Nelson.

You can also write to William at that address if you have any queries.

```
5 rem listing demo
10 print"{2*01}{*02}{*03}{*04}{WHT}{*06}
{BEL}{DIS}{ENS}{LF}{VT}{FF}
{LWR}{SI}"
20 print"{*10}{DWN}{RON}{HOM}{DEL}{*15}{
*16}{*17}{CAN}{*1A}{*1B}{ESC}{RED}{RIG}{
GRN}{BLU}"
30 print"{*80}{ORN}{*82}{*83}{*84}{F1}{F
3}{F5}{F7}{F2}{F4}{F6}{F8}{ CR}{UPR}{*8F
}"
40 print"{BLK}{UP}{ROF}{CLS}{INS}{BRN}{L
RD}{GY1}{GY2}{LGN}{LBL}{GY3}{PUR}{LEF}{Y
EL}{CYN}"
50 print"{CLS}{12DWN}{16RIG}message{HOM
}{2DWN}";
60 print"commodore graphics(next line"
70 print"a{*80}b{*8F}c{*8C}d{*AC}e{*81}f
{*8B}g{*A5}h{*84}i{*A2}j{*85}k{*A1}l{*86
}m{*A7}n{*AA}o{*89}p{*AF}q{*AB}r{*82}s{*
AE}t{*A3}u{*88}v{*8E}w{*83}x{*8D}y{*87}z
{*AD}*{*A6}-{*DC}\{*AB}@{*A4}*{*DF}"
80 print"shift graphics: +{*DB}-{*DD}\{*
A9}@{*BA}^{*FF}*@ >"
```

```
0 goto120
10 ************************************
20 *                                  *
25 *    basic loader to accompany     *
30 *                                  *
35 *       basic lister program       *
40 *                                  *
45 *     for centronics printer       *
50 *                                  *
55 *            written by            *
60 *                                  *
65 *          william mackay          *
70 *                                  *
75 *            june  1985            *
80 *                                  *
85 *                                  *
90 *                                  *
95 ************************************
```

```
110 rem read mc,poke into memory
120 base=12*4096+13*256+15*16:bytesdiv16
=33
122 rem base=start address for routine
126 rem bytesdiv16=no of full data lines
130 by=by-1:s=0:print"please wait while
mc. loaded"
140 for j=ba to ba + by*16 step 16
150 for i=j to j + 15
160 read a:poke i,a:s=s+a:next
170 read a:s=s-int(s/65536)*65536
180 ifa<>s-int(s/256)*256then print"erro
r in"int((i-ba)/16)"th data line":stop
190 next
200 read a,b:a=256*a+b:rem mod 64 k chec
ksum
210 ifa<>sthen print"total checksum in e
rror":stop
220 print"data ok":print"{LWR}":rem"CTRL
 n"
230 print:print"sys52720 to activate"
240 print:print"Then list program in usu
al way"
250 print:print"Once activated, more tha
n one program may be loaded and listed"
260 print:print"To load with basic progr
am in memory,add these lines"
270 print"0 stop"
280 print"1 load"chr$(34)"basic lister"c
hr$(34)",1,1"
290 print:print"Then type goto1"
999 end
1000 data169,26,141,32,03,169,206,141,33
,03,169,50,141,38,03,169,213
1010 data206,141,39,03,169,00,141,254,20
7,141,255,207,162,10,134,198,176
1020 data189,242,207,157,118,02,202,208,
247,96,32,15,243,240,03,76,149
1030 data01,247,32,31,245,165,186,41,04,
208,03,76,91,242,133,154,214
1040 data24,96,72,169,04,37,154,208,04,1
04,76,202,241,104,141,255,55
1050 data207,138,72,152,72,173,254,207,2
40,24,205,255,207,208,16,141,64
1060 data254,207,169,01,248,24,109,255,2
07,141,255,207,216,208,50,32,87
1070 data154,206,173,253,207,201,13,208,
09,32,21,207,173,47,207,24,174
1080 data144,28,201,32,144,217,201,65,14
4,26,201,91,176,02,09,32,89
1090 data201,128,144,10,201,192,144,199,
201,219,176,195,41,127,32,21,16
1100 data207,104,168,104,170,173,253,207
,24,96,169,173,32,21,207,173,199
1110 data255,207,201,01,240,21,74,74,74,
74,240,05,09,48,32,21,239
1120 data207,173,255,207,41,15,09,48,32,
21,207,173,254,207,201,160,145
1130 data144,24,72,74,74,74,74,32,11,207
,141,241,207,104,41,15,144
1140 data32,11,207,141,242,207,162,192,2
08,14,201,128,144,02,233,96,60
1150 data141,255,207,10,109,255,207,170,
232,232,232,142,255,207,202,202,46
1160 data202,189,48,207,32,21,207,232,23
6,255,207,208,244,169,125,32,100
1170 data21,207,169,00,141,254,207,141,2
55,207,96,24,105,246,144,02,15
1180 data105,06,105,58,96,72,169,255,141
,03,221,169,251,45,02,221,142
1190 data141,02,221,169,04,45,00,221,208
,251,104,141,01,221,96,10,185
1195 rem auto if flag  **
1200 data78,85,76,36,48,49,36,48,50,36,4
8,51,36,48,52,87,25
1210 data72,84,36,48,54,66,69,76,68,73,8
3,69,78,83,00,76,36
1220 data70,00,86,84,00,70,70,00,67,82,7
6,87,82,00,83,73,198
1230 data36,49,48,68,87,78,82,79,78,72,7
9,77,68,69,76,36,00
1240 data49,53,36,49,54,36,49,55,67,65,7
8,36,49,65,36,49,58
1250 data66,69,83,67,82,69,68,82,73,71,7
1,82,78,66,76,85,222
1260 data36,56,48,79,82,78,36,56,50,36,5
6,51,36,56,52,00,06
1270 data70,49,00,70,51,00,70,53,00,70,5
5,00,70,50,00,70,172
1280 data52,00,70,54,00,70,56,94,67,82,8
5,80,82,36,56,70,102
1290 data66,76,75,00,85,80,82,79,70,67,7
6,83,73,78,83,66,217
1300 data82,78,76,82,68,71,89,49,71,89,5
0,76,71,78,76,66,109
1310 data76,71,89,51,80,85,82,76,69,70,8
9,69,76,67,89,78,46
1320 data36,66,68,79,208,49,44,52,58,67,
77,68,49,13,00,00,212
1330 data215,212
```

In the import game

by Craig Beaumont

What would the cost be to import a green screen 6128?

I was interested in finding this out so I wrote to MICRO-X Limited in the U.K. and asked for a quote.

This is what came back a few weeks later:—

CPC 6128 (green)	£245
Post, Packaging & Insurance	£50
Total	£295

Note that the 6128 price is discounted and carries no VAT so it is less than the U.K. retail price.

To find the final cost of having the beasty taking up space on my disk it was necessary to convert the quote to $NZ, add the appropriate sales tax and the cost of a banker's draft for the foreign exchange.

The sales tax rate on both the monitor and computer are the same at 10% and a banker's draft from the BNZ costs $2.55.

Assuming an exchange rate of 0.3500 or $2.86 to £1 then:—

CPC 6128 (green)	$700.00
Sales Tax	$70.00
Post, Packing & Insurance	$142.86
Cost of Banker's Draft	$2.55
Total	$915.41

You will need to adjust these figures to account for the exchange rate at the time of purchasing the banker's draft.

The easiest way to do this is to divide the quoted price by the exchange rate in the paper — e.g. £245 / 0.3500 = $700.

So there is a large cost advantage in importing direct — the NZ retail price for the 6128 is $1595.

There are other considerations like possible difficulties in having the warranty acted on, but given the comparitive reliability of Amstrads this is a minor concern.

There should be little chance of the price in the U.K. rising — it is far more likely to have fallen.

Editor's note:— This was a theoretical import excercise. Craig did not actually follow through with the import of an Amstrad.

Therefore he could not report on the predictable problems like: delays, loss of consignment, damage in transit, insurance claims, exporter's liabilities (for inoperative equipment) or of Micro- X's reliability.

Such risks would also have to be part of anyone's import calculations.

* * * * * *

Thanks to Microstyle Computers Ltd in Lower Hutt I can review two animated adventures by Gargoyle Games.

They are Dun Darach and Marsport.

While based on the same animation technique they are from completely different worlds.

You are Cuchulainn the Great returning from battle. Your comrade Loeg was captured and imprisoned by Skar, a strikingly beautiful Sorceress. You make a mighty vow to rescue Loeg and after an arduous journey you come to the city of Dun Darach...

The city is outwardly normal with named streets and numbered houses. This makes mapping simple — a necesary exercise to really master the game.

It is populated by a variety of characters with whom you can interact. Some types of interaction are — buying and selling objects for iridi (the unit of currency), working, banking, bribery and crime. All help you to your ultimate aim — rescuing Loeg.

Throughout your explorations of the

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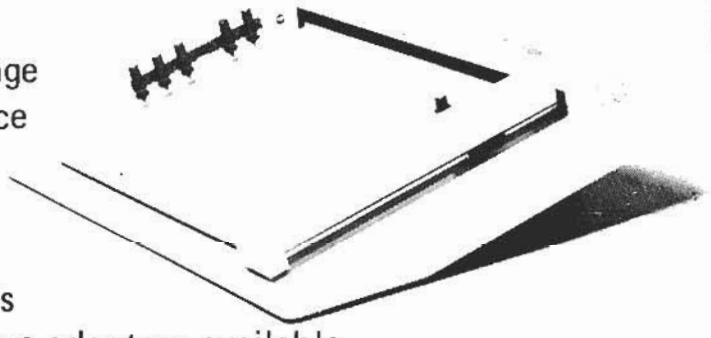

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city you will come across sub-quests; one of these where iridi can be quickly gained or lost in a gambling den.

This game is definitely non-violent as you can't "die", even after committing the most diabolical crime.

In contrast Marsport is the first of the "Siege of the Earth" trilogy. As in all good sieges there is a fair amount of confrontation — in this one it's you against Wardons, Sept Warriors and others.

Marsport is organised into lettered levels and sectors with numbered corridors. You move between levels by means of lifts. These stop only at the top or bottom of their shaft, to get to other levels you must find another lift — this feature builds up a sometimes confusing 3-D labyrinth.

Each level presents it's own challenge to overcome. The corridors have wall cabinets of various types that allow you to manipulate objects. For example by collecting flour, water and a baking tin from supply cabinets you can assemble a cake (however tasteless) that helps with one of these challenges.

Marsport also has a games section. With the help of Infomat to tell you what keys to use, you can keep yourself amused for a while playing cat & mouse and connect 3.

Those are the differences in the games. What they have in common are their smoothly animated characters, their lack of sound, their menu options and their key layout.

The effort required for animation probably explains the lack of sound.

Apart from some comments about flat-footedness it is brillant — especially when you drop to your knee to blast away a Sept Warrior in Marsport.

The menu options include saving and restoring the game status as they may take a number of sessions to complete. The key layout is comfortable and is based on the idea of controlling a camera watching your own character.

Altogether these two adventures are just as intriguing as the "normal" text/graphic types — with the atmosphere and special possibilities given by animation.

While at Microstyle I asked for a demonstration of the 8256 and its word processor program Loco Script. The main aim of this was really to test the little printer (it's about half the depth of the DMP-1) that comes with the machine. It performed well — the letter quality mode being the best I've seen in that range of printers and it was quiet too.

The machine itself is not software compatible with the other Amstrads so it won't form part of this column.

Now Amstrad have put out four computers within 18 months — that must be some sort of record!

* * * * * *

To go with last issue's character set program I have found a little piece of machine code to help print double height characters.

The m/c routine slices a character in half horizontally then spreads the halves over the characters with ASCII values 254 and 255.

In its present form the attached program containing the routine puts a space between each double height character — if you want them next to each other just delete "CHR$(9);" in line 210.

Line 80 illustrates a way to avoid typing "&" for each piece of HEX data and line 180 shows how to move through each character of a string.

The characters with ASCII values 8 to 11 printed in lines 200 and 210 move the cursor to the desired location to print the next visible character.

The program contains an example of the routine in action that should also show how to use it.

```
10 REM Double Height Characters
20 GOSUB 50:REM Set up m/c
30 TEXT$="HELLO":LOCATE 10,10:GOSUB 160
40 LOCATE 20,10:END
50 REM Double Height Char m/c
60 MEMORY HIMEM-50:ad=HIMEM+1
70 FOR I=ad TO ad+49
80 READ a$:POKE i,VAL("&"+a$)
90 NEXT
100 DATA CD,06,B9,F5,3E,00,CD,A5,BB,DD
110 DATA 21,32,90,06,08,7E,DD,77,00,DD
120 DATA 77,01,23,DD,23,DD,23,10,F2,F1
130 DATA CD,0C,B9,3E,FE,21,32,90,CD,A8
140 DATA BB,3E,FF,21,3A,90,CD,A8,BB,C9
150 RETURN
160 REM Print Double Height Char
170 FOR I=1 TO LEN(text$)
180 POKE ad+5,ASC(MID$(text$,I,1))
190 CALL ad
200 PRINT CHR$(254);CHR$(10);CHR$(8);
210 PRINT CHR$(255);CHR$(11);CHR$(9);
220 NEXT:RETURN
```


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The Puzzle of Panos

Are Beeb users to get 16/32 bits?

by Pip Forer

Last month we began to review the 32016 second processor and discussed its capabilities as a super BASIC machine. We complete that task now with a look at its heavier side: its ability to run C, LISP, Fortran and Pascal. The processor comes as a system bundled with these options, which can be installed on NFS, DFS or ADFS. All four run under PANOS, the proprietary operating system of Acorn. Unlike Pandora, which is ROM-based and makes the 32016 virtually transparent to an established BBC user, PANOS is disk based and operates very differently from the normal environment.

My comments must be circumscribed by the provisional nature of the PANOS documentation that I had to hand but PANOS is best described as a sophisticated, text-orientated, disk-based operating system.

It includes a powerful text editor, which is common to all languages supported, and a variety of other utilities including support of time and date stamping of files.

It embraces environments for compiling and linking programs and is procedurally structured to allow execution of one program from another with eventual return to the initiating program for completion of processing.

Compiled code is completely relocatable and one job can use and integrate modules from another language.

The languages are all supersets of ISO standards and come from UK software houses in Edinburgh and Cambridge. At present their built-in extension to handle BBC graphics or I/O system calls have not been fully descirbed (this is not to say there are problems in handling graphics via VDU commands suitably accessed) but quite clearly the implementation can both generate and accept code for or from other systems as well as produce impressive software for the BBC.

The compatibility of the compilers and their range offers a good environment for developers. One might construct an intelligent front end with Lisp (the favoured American AI language), numeric processing with Fortran or Pascal and perhaps some bit-map graphics utilities with C, all for a specific application package.

Two drives

Unlike Pandora, with BBC BASIC it took me a little while to get PANOS operating. Things improved dramatically when I read the documentation however.

For a start it became clear that you must have two disk drives to make it work at all.

Once over that hurdle we got into gear quite quickly.

PANOS at present is in a youthful stage, which is to say that not everything is in place and at times one volume of documentation contradicts another.

To be fair the documentation stresses that this is a trial release and it should be judged as such. By the time you read this I would expect these (very minor) quibbles to be completely corrected.

Setting PANOS up with a language requires a little disk copying to get PANOS on one disk side, its utilities and some program library routines on a second and the language on a third. This leaves one side free for programs.

My testing ran to using PANOS under DFS only: the install options for NFS caused me some trouble and to meet the deadline I passed over an NFS test. However since the 32016 runs flawlessly on the network under Pandora, I would expect no problems.

Fluency

For this review I experimented with the Fortran and C compilers as well as running some of the demonstration programs (one of which makes the interesting claim that the NS32016 can run the SPICE utility 40% faster than a VAX 750).

Language documentation varies greatly in quantity, and for most languages simply covers differences from established standards, i.e. you need to buy a tutor/reference text unless you are fully at home with a language of your choice. The 32016 assembler and instruction set are heavily documented, the C least so.

Loading PANOS takes about 12 sec-

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onds. From there you can create programs through a full-screen edit utility that is simple to use and is designed to allow multiple window editing.

The editor takes about 15 seconds to load.

Create your Fortran program here and save it.

It is then necessary to compile the program and, if successful, link it. When completed succcessfully you are left with relocatable code that can be actioned by just typing the file's name.

I produced a brief program for 10000 square roots as per last week's benchmark. In Fortran the compilation took about 25 seconds, the linking perhaps 15.

The actual calculations took approximately 5 seconds. This is 5 times faster than the 32016 BASIC (and hence 20 times the speed of BBC BASIC).

High speed

It is clearly a powerful processor. Although I had no time to try the square root comparison under C the demonstrations include a Sieve of Eratosthenes benchmark which executes in 2.5 seconds.

This compares with timings reported by Webster's column in Byte for IBM PC (Turbo Pascal) and Macintosh (compiled C and Pascal p-code) of 25.9, 6.5 and 104.1 seconds respectively.

Crude benchmarks may only approximate the truth but the general comparisons give some feel for where the 32016 stands.

Working with PANOS is not unlike working with your own private mainframe or mini: it has sophisticated but complex language options, editors and commands; very powerful but not especially friendly; many error messages, but few self-explanatory to the learner.

Like any such system it is best suited to large (i.e. hard disk) storage media.

At present floppies restrict space and slow the speed.

This latter is significant because even with a large RAM, PANOS does not at present swap utilities permanently into memory (for instance the editor has to re-load each time it is used).

All in all the PANOS/32016 combination offers a good, traditional programmer's development environment but is not yet set up to provide a more appealing user interface for us in education in general.

No doubt this will change and for the present an advanced programming class would certainly revel in the facilities it offers.

Beeb's successor?

One might second-guess a little as to where PANOS may go.

One puzzle is why Acorn chose to design an operating system of their own.

Part of the answer to this may be that Acorn will eventually look for a 16/32 bit successor to the Beeb, and one compatible with Econet conventions.

We have seen that the 32016 can run a lot of standard BBC BASIC programs with little or no change. And with a WIMPs front-end the power is there also to allow the transition across to 16/32 bit computing.

A front end like GEM might run quite smoothly on such a powerful chip.

PANOS may be developing with this sort of progress in mind.

Acorn have a very attractive scientific workstation: in terms of bangs for bucks it is quite outstanding. They are within reach of their aim of an upgrade path from the 6502 to a 16/32 bit chip with minimal user disruption.

It will be interesting to see how they progress from here to a mainstream educational workstation.

The forthcoming Cambridge Workstation specs are not modest, starting at 1 megabyte of RAM as minimum and the release of this may offer some pointers. More on that in June 1986.

Network Software

This column has several times referred to the potential for software that uses the network to the full.

Don Austin in Tokoroa writes with news of just such software developed by him that uses many of the network's good features.

French Suite and German Suite permit a class to run a series of tutorial units on Econet with the teacher being able to monitor progress on a control machine.

This machine can check progress, halt lessons, send messages and, most impressively, modify the progress of any individual's tuition path as they progress through a unit.

Some of you may have seen this demonstrated at the NZCES National Conference.

It is a rather different mode of teaching than the simulations we have discussed before but another illustration of the strength of communication between users.

Any other initiatives happening out there?

Meanwhile, in the glitches department, the listing of the network logger had a procedure omitted (as several readers have let me know). Anyone wanting a full and proper copy just drop a line.

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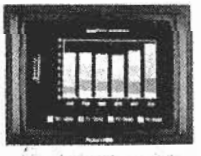

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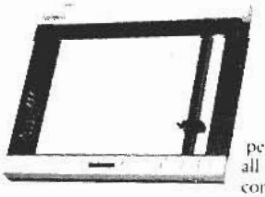

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Hyper-Tunnel

By S. Shearman

This is a hi-res game for any Apple. The object is to rescue men trapped at the bottom of a pit. You must fly a craft down a twisting tunnel, pick up the men, and fly back to the surface. Your ship sinks straight down until it reaches the tunnel entrance, when you gain control of it with the left and right arrow keys.

```
5  REM  BY S.SHEARMAN
6  REM  DEDICATED TO R.BRUCE
10  HCOLOR= 3
20  CLEAR
30  SCALE= 1: ROT= 0
40  POKE 232,0: POKE 233,96
50  GOTO 390
60  FOR I = 24576 TO 24576 + 37: READ A: POKE I,A: NEXT
70  RETURN
80  RESTORE : FOR I = 768 TO 776
90  READ X: POKE I,X
100  NEXT
110  DATA  169,0,162,0,160,0,76,17,244
120  DATA  200,192,40,240,3,76
130 N = 2:L = 4 * (16 * 3):I = DD:L1 = L: POKE 230,32:ZZ = 2
140 X = 160: GOSUB 340:X = 0: GOSUB 340
150  FOR Y = 191 * (I =  - 1) + N * I TO 191 * (I = 1) STEP I * ZZ
160 X = 185: GOSUB 340
170  GOSUB 350
180 X = 153: GOSUB 340
190 Y = Y - N * I
200  GOSUB 350
210 Y = Y + N * I
220  NEXT
230 X = 169: GOSUB 340:X = 0: GOSUB 340
240  FOR Y = (192 - N) * (I = 1) TO 191 * (I = 1) + (N - 1) * (I =  - 1)
250 X = 153: GOSUB 340
260  GOSUB 350
270  NEXT
280  FOR I = 1 TO 6: READ X: GOSUB 340
290  NEXT
300 Y = L1 + 2: POKE L,Y -  INT (Y / 256) * 256:L = L + 1
310  POKE L, INT (Y / 256):L = L + 1
320 X = 96: GOSUB 340
330  RETURN
340  POKE L,X:L = L + 1: RETURN
350  POKE 769,Y: CALL 768
360  POKE L, PEEK (38):L = L + 1
370  POKE L, PEEK (39):L = L + 1
380  RETURN
390  HOME :SR = 16384:DD =  - 1
400  VTAB 12: HTAB 15: INVERSE : PRINT "HYPER-TUNNEL"; NORMAL : GOSUB 102
     0
410  GOSUB 60
420  GOSUB 1600
430  GOSUB 1640
440 DP = 1:M = 150:N = 121:Y = 180:F = 0:G = 279
450  GOSUB 1680
460  POKE 16385,10
470  GOSUB 620
480  GOSUB 750
490  GOSUB 1050
500  IF DP = 150 THEN  GOSUB 620:F = 70:G = 209
510  IF DP = FD - 100 THEN  HCOLOR= 0: GOSUB 620
520  IF DP = FD THEN  GOTO 550
530  GOSUB 1070
540  GOTO 490
550  GOSUB 1090: REM  TOUCH DOWN LIFT OFF
555  HPLOT 0,0 TO 0,191: HPLOT 279,0 TO 279,191
560  GOSUB 1050
570  IF DP = FD - 130 THEN  GOSUB 620:F = 70:G = 209
580  IF DP = 250 THEN  GOSUB 640: GOTO 600
590  GOSUB 1070: GOTO 560
600  GOSUB 1210
610  GOTO 440
620  IF  PEEK (16385) = 0 THEN  POKE 16385,10: POKE 16966,30: RETURN
630  POKE 16385,0: POKE 16966,40: RETURN
640  XDRAW 1 AT M,N: XDRAW 2 AT M,N + 1: XDRAW 2 AT M - 7,N + 1: RETURN
650  XDRAW 1 AT M,N: XDRAW 2 AT M,N + 1: IF  PEEK (234) = 0 THEN  GOTO 14
     20
660  XDRAW 2 AT M - 7,N + 1: IF  PEEK (234) = 0 THEN  GOTO 1420
670  RETURN
680  HOME : VTAB 21: PRINT "SCORE:";SC;: HTAB 30: PRINT "DEPTH:";DP
690  VTAB 22: PRINT "HI-SCORE:";HS;: HTAB 30: PRINT "ROUND:";RD
700  VTAB 23: PRINT "LEVEL:";LV;: HTAB 30: PRINT "MEN:";MN
710  RETURN
720 : VTAB 21: HTAB 7: PRINT SC: RETURN
730  VTAB 21: HTAB 36: PRINT DP;: CALL  - 868
740  RETURN
750  HGR
755  HPLOT 0,0 TO 0,191: HPLOT 279,0 TO 279,191
760 X = 0
770  FOR I = 1 TO 190 STEP 2
780  GOSUB 1010
790  HPLOT 0,190 TO 0 + X,190: HPLOT 279,190 TO 279 - X,190
800 X = X + 2: IF X =  > 120 THEN X = 120
810  CALL SR
820  NEXT
830 X = 120 +  INT ((40 - W) / 2)
840  RETURN
850 C =  INT ( RND (5) * 2) + 1
860  IF C = 1 THEN X = X + Q
870  IF C = 2 THEN X = X - Q
880  IF X < 70 THEN X = 70
890  IF X > 209 THEN X = 209
900  RETURN
910 A =  PEEK (49152)
920  IF A < 128 THEN NM = M: GOTO 960
930  POKE 49168,0
940  IF A = 149 THEN NM = M + R
950  IF A = 136 THEN NM = M - R
960  RETURN
970  FOR I = 1 TO 5
980  FOR S = UA TO UB STEP UC
990  XDRAW 3 AT S,UD:K =  PEEK ( - 16336): XDRAW 3 AT S,UD: NEXT
1000 SC = SC + 500: GOSUB 720: PRINT  CHR$ (7): NEXT : RETURN
1010  GOSUB 650: GOSUB 640:DP = DP + J: GOSUB 730:K =  PEEK ( - 16336): RETURN

1020  VTAB 23: FLASH : HTAB 16: PRINT "REFUELING"
1030  NORMAL
1040 DD =  - DD: GOSUB 80: RETURN
1050  GOSUB 910: GOSUB 1080: GOSUB 850:M = NM: GOSUB 650:DP = DP + J: GOSUB
     730: RETURN
1060  GOSUB 910: GOSUB 1080:M = NM: GOSUB 650:DP = DP + J: GOSUB 730: RETURN

1070  GOSUB 640: CALL SR: RETURN
1080  HPLOT F,Y TO X,Y: HPLOT G,Y TO X + W,Y: RETURN
1090  HCOLOR= 3: HPLOT 0,159 TO 279,159
1100  GOSUB 640
1110  FOR N = N TO 157: GOSUB 1010: NEXT
1120 N = N - 1: GOSUB 640
1130 UA = 275:UB = M + 2:UC =  - 1:UD = 152: GOSUB 970
1140  GOSUB 1020
1150 J =  - J
1160  GOSUB 680

1170 F = 0:G = 279
1180 N = 157: GOSUB 640
1190 Y = 1: FOR N = 157 TO 101 STEP  - 1: GOSUB 1010: NEXT
1200  RETURN
1210  GOSUB 1060: IF X > 120 THEN B =  - 1
1220  IF X < 120 THEN B = 1
1230  IF X = 120 THEN  GOSUB 1070: GOTO 1270
1240 X = X + B
1250  GOSUB 1070
1260  GOTO 1210
1270 X = 120: FOR S = 1 TO 20: GOSUB 1060: GOSUB 1070: NEXT
1280 X = 120: GOSUB 620:F = 0:G = 279
1290 X = X - 2:W = W + 4: GOSUB 1060: IF X =  < 0 THEN  GOSUB 1070: GOTO
     1310
1300  GOSUB 1070: GOTO 1290
1310  FOR N = N TO 10 STEP  - 1
1320  GOSUB 1010: NEXT
1330  GOSUB 640
1340  HPLOT 279,10 TO M + 5,10
1350 UA = M + 3:UB = 269:UC = 1:UD = 3: GOSUB 970
1360  GOSUB 1550
1370  CALL  - 3086
1380 J =  - J
1390  GOSUB 680
1400  RETURN
1410  END
1420  SCALE= 100
1430  FOR I = 0 TO 64: ROT= 1: XDRAW 2 AT 140,96:K =  PEEK ( - 16336)
1440  NEXT
1450  FOR I = 1 TO 5: PRINT  CHR$ (7): NEXT : SCALE= 1
1460 MN = MN - 1: IF MN = 0 THEN  GOTO 1480
1470  CALL  - 3086:J = 1: GOTO 440
1480  HOME : VTAB 12: HTAB 16: PRINT "GAME OVER"
1490  FOR I = 1 TO 100
1500  POKE 49232,0:K =  PEEK ( - 16336): POKE 49233,0: NEXT
1510  VTAB 1: HTAB 5: PRINT "YOUR SCORE WAS ";SC
1520  IF SC > HS THEN HS = SC
1530  VTAB 22: HTAB 7: PRINT "HIT ANY KEY TO CONTINUE";: GET A$: GOTO 390

1540  END
1550  TEXT : HOME : VTAB 12: HTAB 5: PRINT "CONGATULATIONS YOU COMPLETED
     ROUND ";RD
1560  PRINT :RD = RD + 1: HTAB 12: PRINT "PREPARE FOR ROUND ";RD
1570  GOSUB 1020
1580  HOME
1590  RETURN
1600 SC = 0:DP = 0:M = 150:N = 121:Q = 2:W = 30:Y = 180:F = 0:G = 279
1610 J = 1
1620 RD = 1:MN = 3:LV = 1
1630  RETURN
1640  REM  INPUT LEVEL
1650 LV = 1: GOSUB 680: VTAB 23: HTAB 7: INPUT "";LV$:LV =  VAL (LV$)
1660  IF LV < 1 OR LV > 5 THEN  GOTO 1650
1670  GOSUB 680: RETURN
1680  IF LV = 1 THEN W = 30:R = 2:Q = 2:FD = 500
1690  IF LV = 2 THEN W = 25:R = 3:Q = 3:FD = 700
1700  IF LV = 3 THEN W = 20:R = 4:Q = 4:FD = 900
1710  IF LV = 4 THEN W = 15:R = 2:Q = 2:FD = 1200
1720  IF LV = 5 THEN W = 15:R = 4:Q = 4:FD = 1500
1730  GOSUB 680: RETURN
1740  DATA  3,0,8,0,21,0,23,0,63,63,63,39,37,45,45,53,37,193,219,63,0,5,0
     ,55,45,188,50,63,77,253,50,55,111,1,193,46,7,0
```

Strings to enable searches

by Dick Williams

This month's article is about strings. Strings of characters, strings of numbers, adding strings and searching through strings for selected characters, taking the left, right, or middle of strings and counting the number of characters in a string.

As this subject can get a bit complicated for the typesetter, I have provided most of the examples as short programs at the end of this article, and each one will relate to a particular aspect of string handling..

There is no need to type in the rem comments in the programs as these are just to describe what the program is doing.

There are ten short programs in all.

The first shows the basic idea of a string of characters stored in A$ B$ and C$ and then these three strings added together (concatenated) to produce a result on the screen.

Some of you may not realise that the computer stores strings in two places in its memory.

The first place is in the line numbers and the second place is in a part of memory reserved for the storage of strings.

It's easy to prove this, just type in program one and press reset. Note down the bytes free and then run the program.

If you now press reset the bytes free will have dropped, indicating that further memory has been used up.

If you now delete the program lines, using delete 10-80 +CR, and once again press reset, the bytes free will have increased, but not up to the normal memory capacity.

The reason is that even though you have deleted the program that created the strings, they are still in the memory and can be called up by print A$, or print B$ or print A$+B$.

These strings will stay in the computer memory until you cancel them by run, load, new, power off, or by setting them to a null string by this: A$="":B$="":C$=""+CR.

Two problems

This aspect of strings, that they are stored in a separate part of the computer memory, leads to two different problems with the Sega.

The first is that there is a problem with saving them to tape. There is no facility in the Sega to save strings (or variables) to tape although it can be done relatively easily by modifying the end of program pointers. I have covered this point in a previous article (Feb 1985).

In these simple learning programs the lack of tape string storage will not be a problem. However, if you want to go further and really get into string storage then a disc drive would be necessary.

The second problem with strings stored in the computer string storage area is that you can't see them. How is this a problem?

Well, you have to imagine that your strings are stored in a part of the memory that you can't see and while it is a safe place, a mistake on your part can easily wipe them out in a fraction of a second.

For example, say you type in program one and after running it a few times decide to delete 10-80 as I suggested above, then you will still have the strings in the unseen string storage area and can still call them up with print A$ etc.

But if you run and then try to call up A$ you will find that it's gone.

Three into one

Program one is to introduce strings and is a very simple creation of three strings A$ B$ and C$, and then the addition of these three strings to produce a longer one. The point being that D$ is a brand new string created by the addition of A$ B$ and C$.

The new string, D$, shows the three words joined up together and as such don't make sense. This is to illustrate that strings add without a space.

The last part of program one shows a space being inserted between the words

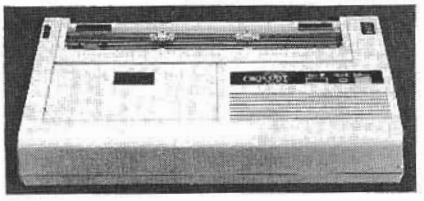
(Continued on page 56

Low-cost colour print

A printer costing less than $700, that offers colour printing and can prepare acetate transparencies, has been announced by AWA New Zealand Ltd.

The Okimate 20's 24-element print head produces more than 100 shades. It can also print a colour transparency and reprint in black with grey tones for photocopies and can be used with thermal paper and no cartridge for black printing.

It offers 80 c.p.s. utility and 40 c.p.s. letter-quality printing for word processing, and is Oki's first printer which is Commodore-compatible. Other versions are for IBM, Apple, standard, serial and parallel connections.



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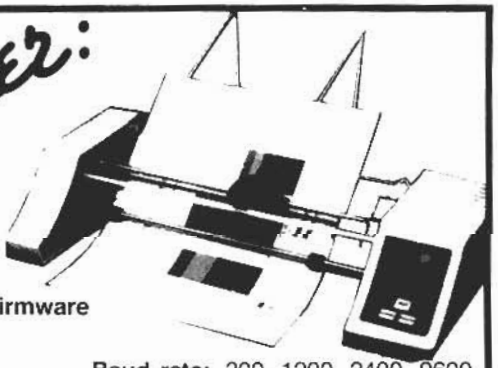

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(Continued from page 55)

so that it looks right when we read it.

The maximum number of characters in a string in the Sega is limited to about 240, so it follows that adding three strings each having 100 characters would not work since the total is 300. You get a "string too long" error message.

Programs 3, 4, 5, 6 and 7 show the various ways of taking the left, right or middle of a string and placing the selected portions into D$.

Programs 8-10 show how to search a string for selected characters.

Code similar to these last three programs make it very easy to obtain data from them. For example, I use program 9 to search 1000 strings to find how many items have been sold at the shop.

All customers have a code such as A1, A2, B1 etc where the alpha character is the first letter of their surname and the number is their code number in that alpha group.

By searching all sales strings (stored on disc) we can quickly count up how many of an item have been sold and also to whom.

Using program 10, we can also find for our video tape library who was the last person to rent a tape. All very easy and quick.

Take the trouble to type each of these programs in and get to know exactly how each one works, because this will help you build up your knowledge of strings on the Sega.

```
10 REM program one add strings
15 A$="THIS PROGRAM"
20 B$="IS TO SHOW"
25 C$="ADDING STRINGS"
30 REM ---print strings
35 PRINT A$
40 PRINT A$+B$
45 PRINT A$+B$+C$
50 REM ---add spaces
55 D$=A$+" "+B$+" "+C$
60 PRINT
70 PRINT D$
```

```
80 REM delete 10-80 and the program
   will delete but the strings are
   still in the computer memory.try
   print D$
```

```
10 REM -program two  adding strings
20 A$(1)="adding"
30 A$(2)="strings"
40 A$(3)-"together"
50 FOR P=1 TO 3
60 D$=D$+A$(P)+" "
70 NEXT
80 PRINT D$
90 D$=D$+"."
95 PRINT D$
98 REM this program adds subscripted
   strings in a for next loop
```

```
10 REM program three LEFT$(    )
20 A$="TAKING THE LEFT OF A STRING"
30 D$=LEFT$(A$,6)
40 PRINT D$
50 REM this program takes the left of
   A$ for 6 positions starting from
   the left,alter 6 to get more or
   less characters.
```

```
10 REM program four RIGHT$(    )
20 A$="TAKING THE RIGHT OF A STRING"
30 D$=RIGHT$(A$,6)
40 PRINT D$
50 REM this program takes the right of
   A$ for 6 positions starting from
   the right,alter 6 to get more or
   less characters.
```

```
10 REM program five RIGHT$(    )
20 A$="TAKING THE RIGHT OF A STRING"
25 FOR P=1 TO 6
30 D$=RIGHT$(A$,P)
40 PRINT D$
45 NEXT
50 REM this program takes the right of
   A$ for 6 positions starting from
   position 1 up to position 6
```

```
10 REM program six MID$(    )
20 A$="123456789"
30 D$=MID$(A$,2,2)
40 PRINT D$
50 REM this takes the middle part of
   A$ starting at position 2 for 2
   more characters
```

```
10 REM program seven  MID$(    )
20 A$="123456789"
25 FOR P=1 TO 9
30 D$=MID$(A$,P,1)
40 PRINT D$
42 IF D$="5"THENPRINT "FOUND 5":BEEP
45 NEXT
50 REM this takes the middle part of
   A$ starting at position P for 1
   character,this can find a seached
   for character in a string
```

```
10 REM program eight  MID$(    )
20 A$="A20L12AB9P4T18K9A43"
30 INPUT "TYPE CHARACTER ";K$
40 FOR P=1 TO LEN(A$)
50 D$=MID$(A$,P,1)
60 IFD$=K$THENPRINT D$;" POSITION";P:
A=A+1
70 NEXT
80 PRINT A
90 REM this takes the middle part of
   A$ starting at position P for 1
   character,this can count the
   occurance of a given character in a
   string.
```

```
10 REM program nine count alpha
20 A$="W3H1ZK5A15G3F6U5E1K2F4"
30 X=0:FOR P=1TOLEN(A$)
40 D$=MID$(A$,P,1)
50 IFASC(D$)>64THENPRINTD$;" ";:X=X+1
60 NEXT
70 PRINT:PRINT X
80 REM this counts the alphabetical
   characters only
```

```
10 REM program ten  get last group
20 A$="WWWWWWWWWWWWBWWWWWWWWW22"
30 FOR P=1TOLEN(A$)
40 D$=RIGHT$(A$,P)
50 IFASC(D$)>64THEN 70
60 NEXT
70 PRINT D$
80 REM searches A$ from right to left
   looking for rightmost alpha
   character,stops and prints RIGHT$(
   from that point to end of string
```


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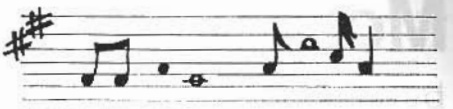


Commodore Music Maker

This is a plastic keyboard which fits right over the keys of your C64.

It turns your computer into a two octave instrument — what type is up to you.

All the variables of the SID chip are programmable from the programme, using the function keys.

Options are:

Change Octave — this allows for the selection of six different octaves for the keyboard.

Rhythm Select — select combinations of drum and bass to add depth to your music.

Poly Play — press three keys at the same time and they all sound. This means you can play chords, something I haven't seen on other keyboards.

Modify Voice — change the variables to make the sound into whatever you want. A chart of 9 different instruments is supplied and this is just the start. I managed to 'discover' an organ combination which I really liked.

Sequencer — this is the pearl. You can copy from sheet music the notes of a song without worrying about their length and then tap out the beat of the tune on one of the keys. The programme combines the notes with the beat and out comes the music with notes of the right length.

I was very impressed with this package. The programme is first class with plenty of on-screen help, and the keyboard fitted well and appeared to be made strong enough to take all but the harshest of treatment. Cost is $79.95, available as disc or tape.

Micro Illustrator

This has to be the best drawing programme around. It is for use with either the joystick or a light-pen.

It's hard to know where to start as there really isn't much this programme can't do.

You can draw free-hand lines, points, straight lines, rays (ie several lines all starting in the same spot), boxes (filled or unfilled), circles (filled or unfilled), and also fill any area on the screen.

You can draw something in one quarter of the screen and mirror it in the other three.

You can magnify one part so that you can work on the fine details.

You can select an area of drawing and then reproduce anywhere else on the screen as many times as you like.

The disc comes with several sample pictures which certainly give you an idea of what can be achieved.

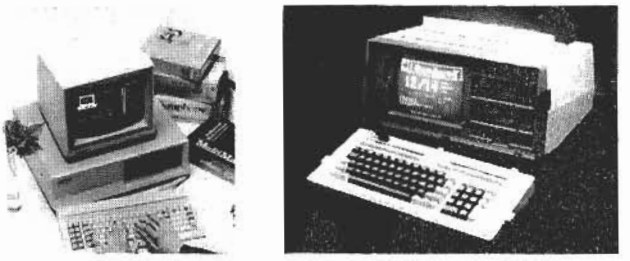
Also supplied is a very comprehensive manual of the various functions.

Once loaded all that is required is control of the joystick and hitting space bar to switch between drawing screen and command screen.

An excellent programme well worth the price for anyone interested in using the C64 or Plus 4 for drawing. Cost is $59.95, on disc only.

Reviewed by
Andrew Mitchell

Bondwell



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More ways to make noise

by Joe Colquitt

Last issue, I presented a program which used an interrupt to time notes and repeat a sequence, independent of a Basic program.

I hope that you've done some experimenting with it, and probably those who know a bit of machine-code have pulled it apart.

This month, I'll give you a disassembly of the routines and a couple of ideas for modifications.

The routines for SYSNOISE and SYSOFF are the same except for the address that is put into $0314/$0315. SYSOFF restores EA31, and does POKE54296,0. Prog. follows:

These sorts of routines can be equally effective when setting up sprite registers, (colour, position etc), graphics screens, or indeed any program that uses an array of fixed or bank-switchable variables, (eg from a menu).

The JMP at $C090 can be replaced with a JMP to a sub-routine, which could, for example, link up another register.

The JMP could even have its own table of addresses, so that you could implement a menu of different effects by using JMP$table.

You may get away with changing the address by Basic POKES. I say 'may' because the POKES would have to be executed in the same interrupt cycle, otherwise you'd have only half the address changed, and the computer would find the wrong address on the next cycle.

It would be safer to pass the new address to an ML routine, which will do it heaps faster:—

C090 JMP$C142;(replaces EA31)

C142 LDA$C970; put note timer
C145 STA$D417; into filter
C148 JMP$EA31; continue

```
1) setting the interrupt (SYSNO)

C000 SEI          ;disable interrupt register
C001 LDA#$24      ;
C003 STA$0314     ;poke788,36
C006 LDA#$C0      ;
C008 STA$0315     ;poke789,192
C00B LDA#$0F      ;
C00D STA$D418     ;poke54296,15
C010 CLI          ;enable interrupt register
C011 RTS          ;return

2) playing the notes

C024 PHA          ;PusH Acc onto the stack
C025 TXA          ;transfer X contents to A
C026 PHA          ;push it onto stack
C027 TYA          ;transfer Y contents to A
C028 PHA          ;push it onto stack
C029 DEC$C970     ;decrement note counter
C02C LDA$C970     ;
C02F CMP#$00      ;if <> 0
C031 BNE$C08B     ;then don't change note
C033 LDY$BFFE     ;get the new note number
C036 LDA#$00      ;turn previous notes off
C038 STA$D404     ;
C03B STA$D40B     ;
C03E STA$D412     ;
C041 LDA$9000,Y   ;get new voice1 note LOW
C044 STA$D400     ;POKE54272,LOW
C047 LDA$9100,Y   ;get new voice1 note HI
C04A STA$D401     ;POKE54273,HI
C04D LDA$9200,Y   ;ditto voices2,3
C050 STA$D407     ;
C053 LDA$9300,Y   ;
C056 STA$D40B     ;
C059 LDA$9400,Y   ;
C05C STA$D40E     ;
C05F LDA$9500,Y   ;
C062 STA$D40F     ;
C065 LDA$9600,Y   ;get the new duration value
C068 STA$C970     ;store it
C06B INY          ;Y=Y+1, ready for new note
C06C STY$BFFE     ;store it
C06F LDA$C960     ;get waveform voice1
C072 STA$D404     ;POKE54276,wave
C075 LDA$C961     ;ditto voice2,3
C078 STA$D40B     ;
C07B LDA$C962     ;
C07E STA$D412     ;
C081 CPY$BFFF     ;compare index with seq length

C084 BNE$C08B     ;if <> then don't reset index
C086 LDY#$00      ;if it is, then set index to 0
C088 STY$BFFE     ;store it
C08B PLA          ;get register values off stack
C08C TAY
C08D PLA
C08E TAX
C08F PLA
C090 JMP$EA31     ;and jump to housekeeping
```

```
3) raise an octave (SYSUx)

C0DC TXA          ;save X on the stack
C0DD PHA          ;
C0DE LDX#$00      ;set index to 0
C0E0 ASL$9000,X   ;double the low byte
C0E3 ROL$9100,X   ;double the high byte, (+carry)
C0E6 INX          ;
C0E7 BNE$C0E0     ;loop if X<256
C0E9 PLA          ;restore original X value
C0EA TAX          ;
C0EB RTS          ;return to BASIC

4) lower an octave (SYSDx)

C10C TXA          ;save X
C10D PHA          ;
C10E LDX#$00      ;set index
C110 LSR$9100,X   ;halve high byte
C113 ROR$9000,X   ;halve low, (+128 from high)
C116 INX          ;
C117 BNE$C110     ;
C119 PLA          ;
C11A TAX          ;
C11B RTS          ;

5) double note length (SYS5D)

C0C1 LDX#$00      ;set index
C0C3 ASL$9600,X   ;double byte value
C0C6 INX          ;loop
C0C7 BNE$C0C3     ;
C0C9 RTS          ;

6) halve note length  (SYSHA)

C0CA LDX#$00      ;
C0CC LSR$9600,X   ;halve byte value
C0CF INX          ;
C0D0 BNE$C0CC     ;
C0D2 RTS          ;

7) reset index  (SYSRS)

C13C LDA#$00      ;
C13E STA$BFFE     ;
C141 RTS          ;

8) same value     (SYSSA)

C0D3 LDX#$00      ;Acc set before call
C0D5 STA$9600,X   ;store in duration array
C0D8 INX          ;
C0D9 BNE$C0D5
C0DB RTS

9) transfer a block  (SYSTR)

C0AD LDY#$00      ;get 255 values
C0AF LDA($FB),Y   ;from RAM and
C0B1 STA($FD),Y   ;store in plot area
C0B3 INY          ;
C0B4 BNE$C0AF     ;
C0B6 INC$FC       ;repeat until
C0B8 INC$FE       ;play area limit
C0BA LDA$FF       ;is reached
C0BC CMP#$97
C0BE BNE$C0AD
C0C0 RTS

10) move register values  (SYSRE)

C0BF LDY#$00      ;move 19 values
C0A1 LDA($FB),Y   ;from RAM into
C0A3 STA$D400,Y   ;SID registers
C0A6 INY
C0A7 CPY#$19
C0A9 BNE$C0A1
C0AB RTS
```


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Exploring ON commands

By Don Stanley

This and the next article will explore the ON statement and its various adaptations for SVI/MSX Basic.

ON <condition> GOTO/SUB

Under SVI/MSX Basic there are a number of ways these commands can be used. Here is a comprehensive list for SVI. This excludes the ON MDM .. command which is essentially superfluous to SVI users here.

ON <expression>	GOTO
ON <expression>	GOSUB
ON ERROR	GOTO *
ON STRIG	GOSUB *
ON INTERVAL=n	GOSUB *
ON KEY	GOSUB *
ON SPRITE	GOSUB *
ON STOP	GOSUB *

The starred (*) statements are global interrupt statements. These are set up somewhere in the program and while set up cause Basic to check whether the condition has been satisfied at the end of every line.

In this issue I'll deal with the first three commands in the list and explore the other interrupt commands next time.

Transfer line

ON <expression> GOTO is used when you want to transfer to a certain line of your program, but where you are doing the transfer on the basis of some other variables value. Suppose you have a variable called X1. If X1 is 1 you want to GOTO 1000, if X1 is 2 you want to go to line 2000, if X1 is 3 you want to go to line 3000. You could do it like this, using the IF statement.

IF X1=1 THEN 1000 ELSE IF X1=2 THEN 2000 ELSE IF X1=3 THEN 3000.

(By the way, just a byline note that you do not need to use the word GOTO in an IF statement like the above.)

Basic provides an alternative to this method which avoids using the IF. In case you are wondering why an alternative should be necessary, it's to do with a number of factors:— IF .. THEN .. ELSE statements are hard to follow as the number of options increases, and more importantly, Basic's internal stack can be overflowed with a large number of IF .. THEN .. ELSE's.

The alternative is the ON .. GOTO statement.

To use the ON xx GOTO statement requires the variable or expression xx to have values ranging from 1 up to maximum of 255. They need not be integers, but fractional numbers are truncated to integers first (not permanently, only for the ON .. GOTO).

The above IF statement is written as follows using ON .. GOTO.

```
ON X1 GOTO 1000,2000,3000
```

This means that line 1000 will be transferred if X1 is 1, line 2000 if X1 is 2, and line 3000 if X1 is 3. If X1 is 0 or X1 is above 3, then Basic will just carry on to the next line.

You do not need to specify a line number to go to for each possible value of X1. Maybe you only want to jump if X1 is 2 or 4; you would then code the line like this:

```
ON X1 GOTO ,2000,,4000
```

The first comma means that Basic will treat the line numbers as if a number was before it, the two commas after line 2000 are treated as if a value was between them.

There is a problem here though, namely what happens if X1 is 1 or 3?

It would be logical to expect that Basic would just go to the next line.

In SVI/MSX Basic a syntax error is generated under this condition.

You need to be careful about how you use this when omitting line numbers, and one way around this problem is indicated further on with the ON ERROR statement.

(The use of commas like this is possible since Basic only counts commas when looking for a line number, it does not consider any preceeding line numbers.)

Variable

X1 above is a variable. That is not a necessary condition for this statement. Any expression which has a value between 0 and 255 can be used there.

To illustrate, suppose you want to jump to a certain line depending on whether a string variable has the value "A" "B" or "C"?

Obviously A, B and C are not numbers. You use the INSTR function to give a numeric value, and jump to that value. With INSTR you give a string which will be searched for a second specified string.

The point in the first string where the second string begins is what INSTR returns, (0 if the second string is not found). Here's how it's done:

```
ON INSTR("ABC",X1$) GOTO 1000,2000,3000.
```

Now if X1$ is "A" then INSTR("ABC",X1$) returns 1 so the jump is to line 1000, and similarly for "B" and "C". If X1$ were "D" no jump would be made and thus the program would just carry on after the ON .. GOTO statement.

A frequent question I get asked is:

"In a program where I want a single character from A to Z input, how can I check for lower case characters and jump to the correct line as if they were uppercase?"

One solution (among many) is to use INSTR. Suppose the letter entered should be A, B or C. You use the following:

```
ON INSTR("AaBbCc",X1$) GOTO 1000,1000,2000,2000,3000,3000
```

or

```
ON INT((INSTR("AaBbCc",X1$)+1)/2) GOTO 1000,2000,3000
```

When using ON ... GOTO it is worth having some sort of check on the line following the ON ... GOTO. Then if a 0 or value outside the range for which there are linenumbers occurs some action can be taken. For the previous example you may have:

```
100 X1$ = INPUT$(1)
110 ON INSTR("AaBbCc",X1$) GOTO 1000,1000,2000,2000,3000,3000
120 PRINT "You MUST Enter one of A B or C"
130 GOTO 100
```

The above example illustrates that the line-numbers to jump to need not be unique.

Subroutines

ON <value> GOSUB is a further ability.

All the above statements about ON ...

(Continued on page 60)

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(Continued from page 59)

GOTO apply here. The only difference is that you are sending Basic to a subroutine, which means that you should have provision to send it back.

A subroutine is a section of code which is jumped to and then returned from. Usually it is some code that you use over and over in your program, coding it as a subroutine means you only code it once instead of coding it each time you want to use it. For instance:—

```
 10 INPUT X
 20 IF X > 100 THEN GOSUB 100 :
GOTO 10
 30 INPUT Y
 40 IF Y > 100 THEN GOSUB 100 :
GOTO 30
 50 INPUT Z
 60 IF Z > 100 THEN GOSUB 100 :
GOTO 50
  ..
  ..
100 CLS
110 PRINT "Error In Input — Must Be
Less Than 100"
120 FOR I = 1 TO 500
130 NEXT
140 RETURN
```

The subroutine begins at line 100. It could have been coded each time you wanted to use it, which would have meant more typing, more chance of errors entering it, and more memory used.

ON ... GOSUB requires that the word RETURN be entered at the end of the subroutine. If you omit it, several things could occur. One is that Basic runs out of lines, in which case a GOSUB WITHOUT RETURN error will occur.

Another is somewhat more subtle.

Basic could get back to the code which called the subroutine (especially if you have GOTO's in the subroutine or maybe an ERROR trap which RESUMES somewhere before the subroutine was called) and call the subroutine again. If this happens you are likely to run out of memory — fast.

The reason is that Basic needs to keep track of where it returns to when a *GOSUB is used, so it puts 2 bytes on the* stack. If you don't go back with a RETURN those two bytes stay there, to be followed by two more the next time you go to the routine without a RETURN, and so on until you fill up all the available user RAM.

Basic all this time thinks you are still executing the first subroutine, after all it hasn't found a RETURN so it's just one big subroutine to Basic.

You can have more than one RETURN in a subroutine. Perhaps your subroutne asks for some input from the user, you can RETURN if this is a certain value or carry on if not.

But do ensure that all subroutines have a RETURN in there somewhere, and that Basic can access it.

Error control

The ON ERROR GOTO command gives you control over any errors which may occur. If an ERROR of any sort is encountered while running your program and the statement ON ERROR GOTO 5000 has been included at the start, then Basic will goto line 5000.

You would have some error checking and possibly correcting routine at line 5000.

There are two extra variables used with ON ERROR GOTO. These are created by BASIC and are called ERR (ERRor number) and ERL (ERror Line). Your error handling routine can check the values of these variables and use them to take some corrective action.

Suppose you use the ON <value> GOTO statement as I used it above with the commas replacing numbers. If X1 was 1 or 3 Basic will crash with a syntax error. You can avoid this as follows:

```
 100 ON ERROR GOTO 5000
 200 ON X1 GOTO ,1000,,4000
 300 IF X1=1 OR X1=3 THEN PRINT
"ERROR IN X1"
 400 ...
     ...
5000 IF ERR=2 AND ERL=200 THEN
RESUME 300
5010 PRINT "ERROR",ERR,"OC-
CURRED AT LINE",ERL
5020 ON ERROR GOTO 0
5030 END
```

ON ERROR GOTO is a global interrupt.

When an error occurs Basic checks the contents of memory locations F7E5/F7E6 (SVI). If this is 0 then Basic prints the error message and line then stops. Otherwise Basic jumps to the location which is the contents of those two locations.

These two memory locations are 0 unless you set them using ON ERROR GOTO.

But at the end of a program Basic does not reset them back to 0.

This means that any subsequent statements that cause an error will *restart the program at the error line.* Thus when ENDing a program, use ON ERROR GOTO 0 to ensure that you don't suddenly get thrown back into the program if you misspell a command.

The extra to use with ON ERROR GOTO is the RESUME. This tells Basic to restart from somewhere.

In the above example, if the error was just an X1= or 3 error the program carries on from line 300. You can use RESUME with no line number to send BASIC back to where the ERROR occurred (which would cause an infinite loop in the above example as the ERROR would immediately reoccur and thus reinvoke the ERROR routine), with a line number as above, or with the word NEXT (RESUME NEXT) to go to the line after that where the error occurred.

Advancements

Advanced programmers can manipulate certain high memory locations to advantage when doing error checking.

For instance F7E3/E4 contain the memory location which is the end of the line before the one where the error occurred, F7E5/E6 contain the line number to jump to on an error condition, F7E7 is FF if Basic is in an error trapping routine, and zero if Basic is not in an error trapping routine.

F53F contains the last error number (ERR) set by Basic or by your program.

Locations F7DF/E0 will contain the line number where the last error occurred.

All these values are for SVI, not MSX.

The corresponding MSX locations are F6B7/B8 (end of last line); F6B9/F6BA (line #); F6BB is the trap indicator; F414 (ERR); F6B3/B4 (ERL).

Finally you can add to Basic's error list by using the ERROR command, for instance, in the above program chunk:

```
150 IF X=1 THEN ERROR 99
```

will cause an ERROR and jump to the error routine from line 150.

The error mesage printed will be UNPRINTABLE ERROR IN 150 — you can only set up an error number, not an error message. However the DISK error messages are in RAM, so you could POKE your own error message over the top of a disk error message then use the error number corresponding to that message in your ERROR statement (thus producing your own error if you have a disk system).

The disk messages are in RAM at location EB22 and go through to location EC01. Each message ends with a zero byte.

Next month I will continue the ON theme with the interrupt commands.

To finish off this article, I have received many requests from people wanting to learn how to use CPM. Any CPM-80 books on the market are applic*able to CPM on the SVI/MSX machine.*

In particular Soul Of CPM, by Mitchell Waite & Robert Lafore is very good both to learn from and to get more advanced knowledge. It gets a bit technical since its overriding aim is to teach 8080 machine code programming, but is quite readable if you have a little computer expertise. I would not recommend it for absolute beginners.

Also for advanced users is Mastering CPM by Alan R Miller.

If anyone can recommend a good book for beginners please let me know via P.O. Box 7057, Wellington South.

Spectrum's future is cloudy

by Gary Parker

The Spectrum is probably the oldest of the current popular home computers, and despite its popularity it cannot last forever. What lies ahead?

The Spectrum really consists of three computers — the original model, the Spectrum Plus, and now the 128K model.

First there was the rubber-keyboard model, of which over a million were sold. This model was the first cheap colour home computer.

I remember the first Spectrums to arrive on our shore. At that time 48K seemed an incredible amount of memory, and considering the price, people were prepared to put up with the poor keyboard and suchlike.

At that time most people buying a home computer tended to be quite highly 'computer literate'. They didn't expect the Spectrum to be like the computers they used at work. They were amazed that they could buy a computer so cheaply at all.

For the masses

But as the home computer became a mass-market product, people who knew little about computers were in the market for one.

As one retailer told me: "These days, people walk into the shop, and ask to see one of these Spectrum things their little Johnny is telling them about.

"I show them one, and I can tell from the look on their faces that they are not going to spend that amount of money on such a small black box.

"So I lead them over to another computer which, although less powerful, comes in a bigger case..."

The problem is that to the public at large, looks are the most important part of a home computer.

A compouter science major knows that RAM is RAM whatever package it sits in, but to the person on the street, the bells and whistles are what impress.

As technology advances and people begin to expect more of a home computer, the Spectrum is slipping behind its competitors in terms of sales.

Actually, it still contains quite a competitive amount of memory, but it is sadly lacking in the bells and whistles department.

Towards this end, Sinclair had produced the Spectrum Plus. It considerably improved the Spectrum's public appeal, but did nothing to internally improve the machine.

New home computers are released all the time, and many are starting to approach the Spectrum's price.

When I bought a Spectrum, the Commodore 64 was out of reach. But now that every computer is cheap, Sinclair computers have less to offer over the competition.

This has been reflected by a slump in sales.

What appeal?

So what can Sinclair offer the modern public?

Now that computers are cheap, Sinclair machines cannot sell by price alone.

When most simple home computers cost in the region of $1000, a Sinclair computer costing about $300 or less did offer the sort of saving that tempted buyers.

And people were prepared to tolerate the Spectrum's evident shortcomings.

But nowadays, even though Sinclair computers may still be cheaper than most other brands, the overall low prices in the home computer market has resulted in buyers being willing to pay that little bit extra for a cosmetically superior computer.

Will Sinclair produce more technically superior computers?

In today's highly competitive market, that seems unlikely.

The QL was the first of its kind, but the fact of its hasty design showed. Accordingly, the QL gained a bad name.

Despite the fact that later versions have had the bugs ironed out, sales are reported to be slow.

Perhaps the road to success lies in producing a technically advanced computer at a cheap price?

Sinclair recently halved the price of the QL in Britain to £199 (NZ$500). A friend of mine saw QLs selling in Britain for £130 (NZ$320). This is at the same price the Spectrum was selling just a few months ago!

I might have a few reservations about the QL, but at half the price I originally paid for my Spectrum, I'd snap one up!

Pocket money

Where does this leave the Spectrum?

Frankly, with the QL selling at that price, and other advanced computers such as the Atari ST on the horizon, I see little future for the Spectrum.

Perhaps it will follow the path of the ZX81, selling for little more than a few weeks' pocket money, so that it will appeal to children.

Sinclair have released a 128K Spectrum in Spain. At the time of writing (Dec), it had not been released in Britain, probably because the QL is now selling in the price bracket intended for the 128K Spectrum.

The 128K Spectrum has a few improvements over the Plus, such as three-channel sound, but it's doubtful whether it could be produced cheaply enough to be significantly cheaper than the QL.

Also, a computer with poorer specifications is not always cheaper to produce.

For example, the 512K Atari ST is actually cheaper to produce than the 128K model. This is becuase the 128K model was designed to use many small-capacity chips, whereas the 512K model was designed to use only a few large chips.

By the time the Atari computer was nearing production, the price of the large chips had fallen so dramatically that the 128K model cost more to produce. Not surprisingly, the 128K model was dropped.

Not compatible

Why would anybody want a 128K Spectrum?

Well, the Spectrum has a huge software base supporting it.

This might be reason enough to buy a 128K Spectrum, except the new model's ROM has been slightly altered to incorporate the new routines controlling memory paging, so it is not 100% compatible.

A friend of mine has a Spectrum with a customised ROM which uses the 1K of spare memory which exists in the Spectrum's 16K ROM, to control his printer.

Since this memory was spare in the original model, you'd think it would still work with all software. But it doesn't — some games don't work.

The games designers have made the game programs check that memory, possibly so that any alterations designed to aid piracy can be detected.

The 128K model undoubtedly also makes use of that spare 1K, and so is not completely compatible.

The 128K Spectrum loses its main raison d'etre — the software base.

So the future of the Spectrum would seem to be grim.

Possibly it will continue to sell as a kid's computer, as has been the case with the ZX81.

Whatever happens, those million-plus Spectrums will remain, ensuring continued demand for associated products, and so continued support for the machine.

Morse Code

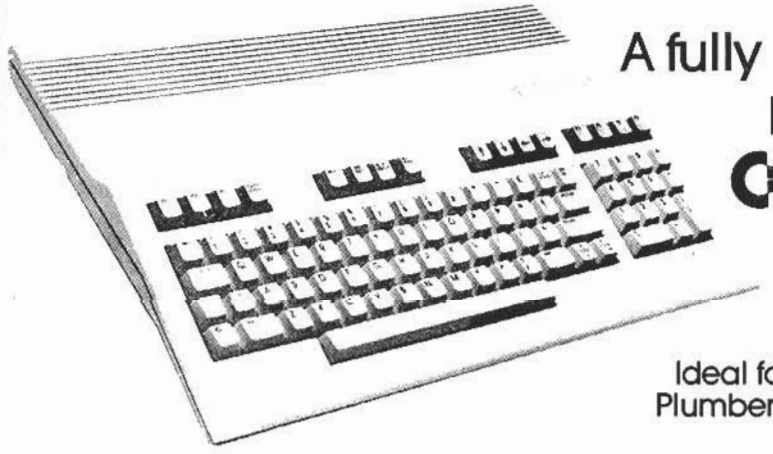
By Peter Smith

This entertaining program will convert any message you type into the computer to morse code.

It will draw the message as dots and dashes, and accurately beep out the message using the Spectrum's internal loudspeaker.

```
  5 POKE 23658,8
 10 INPUT "TYPE IN MESSAGE:"; L
INE a$
 20 IF a$="" THEN  LET A$="BITS
 AND BYTES"
 30 FOR N=1 TO LEN A$
 31 IF A$(N)="." OR A$(N)="?" T
HEN  GO TO 60
 32 IF A$(N)=" " THEN  FOR X=1
TO 52: NEXT X: PRINT ': GO TO 11
2
 33 IF CODE A$(N)<48 OR CODE A$
(N)>90 THEN  GO TO 115
 35 IF CODE A$(N)>57 AND CODE A
$(N)<65 THEN  GO TO 115
 60 LET b$=a$(n)
 70 RESTORE 1000+(CODE b$-48)
 80 READ c$
 85 PRINT 'A$(N);TAB 10;
 87 POKE 23692,0
 90 FOR m=1 TO LEN c$
100 BEEP (VAL c$(M))/15,0
105 IF C$(M)="2" THEN  PRINT "-
";
106 IF C$(M)="1" THEN  PRINT ".
";
110 NEXT m
115 FOR X=1 TO 5: NEXT X
120 NEXT n
125 FOR X=1 TO 100: NEXT X
130 CLS : GO TO 10
998 DATA "121212"
1000 DATA "22222"
1001 DATA "12222"
1002 DATA "11222"
1003 DATA "11122"
1004 DATA "11112"
1005 DATA "11111"
1006 DATA "21111"
1007 DATA "22111"
1008 DATA "22211"
1009 DATA "22221"
1015 DATA "112211"
1017 DATA "12"
1018 DATA "2111"
1019 DATA "2121"
1020 DATA "211"
1021 DATA "1"
1022 DATA "1121"
1023 DATA "221"
1024 DATA "1111"
1025 DATA "11"
1026 DATA "1222"
1027 DATA "212"
1028 DATA "1211"
1029 DATA "22"
1030 DATA "21"
1031 DATA "222"
1032 DATA "1221"
1033 DATA "2212"
1034 DATA "121"
1035 DATA "111"
1036 DATA "2"
1037 DATA "112"
1038 DATA "1112"
1039 DATA "122"
1040 DATA "2112"
1041 DATA "2122"
1042 DATA "2211"
```

A128 Accounting



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Videoconferencing

The NZ Post Office is evaluating both the technoloy and market for videoconferencing, it was announced at a recent joint NZPO/GEC presentation on videoconferencing.

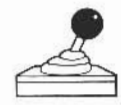
Telecom marketing manager Norm Nicholls said the present high cost of video circuits and videoconferencing equipment meant that travel was still a cheaper option for most companies.

However several factors could increase the appeal of videoconferencing, including:

- increasing costs of business travel,
- increasing emphasis on face-to-face negotiations rather than letter writing and phone calls,
- increasing importance of international communications,
- increasing capabilities in videoconferencing technology.

It's a winner

By Michael Fletcher



It's a midsummer night, you and your family are cruising the highway from L.A. to Denver when suddenly cars start screaming past.

What is this? The name of the game is The Great American Road Race, manufactured by Activision — and something different to the usual car racing game.

When the program is loaded you are presented with title screen showing a car blowing up dust and credits in the production of the program.

Then follow vital statistics of past road races. You pick your course — a map of the United States shows the four routes.

On the bottom of the screen is the dashboard of your car — a fuel gauge, rev counter, clock and speedometer.

To change gears you have three elements — clutch, gear stick, rev counter.

You have to ensure sufficient revs to change into higher gear, the signal being a high pitched car whine or the rev reading.

The clutch is depressed by pushing the red action button and the gear stick moved by pushing the joystick forward.

Just be careful after changing gear to release gently the fire button before accelerating.

The hazzards include snow — difficult, because in snow it becomes a lot easier to hit other cars. Hitting a car causes you to crash.

Other hazzards are night driving, busy highways, oil and rain.

An obstacle is the inevitable traffic patrol car.

To get past you have to slow down to 55 m.p.h., or risk spending valuable time again on the side of the road.

An important element is fuel. At every 100 miles a fuel pump is displayed, but refuelling stops are your choice/risk.

Overall this race puts car games into a new dimension of reality. Graphics and sound enhance Atari's already superior gaming qualities.

The Great American Road Race is on a 32K disk, supplied by Activision.

The Solar System

By Stephen Botha

This program provides a demonstration about the nine main planets of our solar system. It displays each planet in turn and facts about it. Full instructions are contained in the program.

Note that the right-hand brace character in line 9005 stands for the clear screen character (obtained by pressing ESC then CTRL-CLEAR).

```
0 REM ******THE SOLAR SYSTEM******
1 REM ******BY STEPHEN BOTHA******
2 REM ********************************
5 REM POKE 82,0 BEFORE YOU START TYPING,SO THAT CERTAIN LINES CAN FIT IN.
90 REM LINE 100,101 WORDS IN "" ARE TO BE WRITTEN IN INVERSE VIDEO.
99 POKE 82,2
100 GRAPHICS 17:POSITION 2,0:? #6;"THE SOLAR SYSTEM":POSITION 2,11:? #6;"BY STEPH
EN BOTHA"
101 POSITION 5,3:? #6;"PRESS START":IF PEEK(53279)=6 THEN GOTO 120
102 FOR I=INT(RND(0)*4000)+1 TO INT(RND(0)*1500)+1 STEP INT(RND(0)*50)+11:SOUND 0,
I,10,2:SOUND 1,I+10,10,2
103 SOUND 2,I+20,10,2:SOUND 3,I+30,10,2:IF PEEK(53279)=6 THEN 120
110 NEXT I
115 GOTO 101
120 FOR II=0 TO 3:SOUND II,0,0,0:NEXT II
200 GRAPHICS 0:PRINT "THIS PROGRAM PLOTS THE SUN,THEN DRAWS THE 9 MAIN PLANETS,F
ROM LEFT TO RIGHT."
210 PRINT "TO GET INFORMATION ON EACH PLANET,     PRESS A KEY FROM 1 TO 9(E.G. FO
R THE  FAR RIGHT PLANET,PRESS 9."
211 PRINT "NOTE:SIZE OF OBJECTS ARE NOT CORRECT  (BUT RELATIVE DISTANCES ARE."
212 PRINT "E STANDS FOR EARTH.":REM PUT 'E' IN INVERSE
215 PRINT "WHEN GRAVITY IS SAID TO BE 1,THAT      MEANS THE GRAVITY EQUALS THAT O
F THE  EARTH,WHICH IS)."
216 PRINT "9.8 METRES PER SECOND/PER SECOND       (10 M/S/S)"
217 PRINT "AFTER YOU HAVE FINISHED LOOKING AT THEINFORMATION ABOUT A CERTAIN PLA
NET,   PRESS ANY KEY TO BEGIN ":
218 PRINT "AGAIN.":PRINT
220 PRINT "PRESS ANY KEY TO CONTINUE."
221 IF PEEK(764)=255 THEN 221
1000 GRAPHICS 8:SETCOLOR 2,0,0:COLOR 1
1001 DEG :FOR A=5 TO 100 STEP 2.95:X=SIN(A)*10:Y=COS(A)*10:PLOT X+18,Y+78:DRAWTO
 18-X,Y+78
1002 PLOT X+18,78-Y:DRAWTO 18-X,78-Y:NEXT A
1010 PLOT 32,71:PLOT 35,71:PLOT 30,71:PLOT 42,71:PLOT 71,71:PLOT 106,71:PLOT 103
,71:PLOT 270,71:PLOT 313,71
1045 PRINT "SELECT A PLANET:PRESS 1 - 9"
1050 COLOR 1:POKE 752,1
1100 IF PEEK(764)=31 THEN 2000
1101 IF PEEK(764)=30 THEN 2100
1102 IF PEEK(764)=26 THEN 2200
1103 IF PEEK(764)=24 THEN 2300
1104 IF PEEK(764)=29 THEN 2400
1105 IF PEEK(764)=27 THEN 2500
1106 IF PEEK(764)=51 THEN 2600
1107 IF PEEK(764)=53 THEN 2700
1108 IF PEEK(764)=48 THEN 2800
1200 GOTO 1050
2000 PLOT 32,0:DRAWTO 32,68:PLOT 28,68:DRAWTO 32,68:PLOT 36,68:DRAWTO 32,68
2001 ? "MERCURY:DIST. FROM SUN-57,900,000km:DIAMETER-4,880km:GRAVITY-.38 OF E'S:
DAY-59 E DAYS:YEAR-88 E DAYS"
2002 GOSUB 9000:REM IN LINE 2001,WORD 'MERCURY' AND THE 'E' IN INVERSE(SIMILAR T
O LINES 2001,2101,2201,ETC...
2006 COLOR 0:PLOT 32,0:DRAWTO 32,68:PLOT 28,68:DRAWTO 32,68:PLOT 36,68:DRAWTO 32
,68:POKE 764,255:GOTO 1045
2100 PLOT 35,0:DRAWTO 35,68:PLOT 31,68:DRAWTO 35,68:PLOT 39,68:DRAWTO 35,68
2101 ? "VENUS:DIST. FROM SUN-108,200,000km:DIAMETER-12,100km:GRAVITY .9) OF E'S:
DAY-243 E DAYS:YEAR-224.7 E DAYS"
2102 GOSUB 9000
2103 COLOR 0:PLOT 35,0:DRAWTO 35,68:PLOT 31,68:DRAWTO 35,68:PLOT 39,68:DRAWTO 35
,68:POKE 764,255:GOTO 1045
2200 PLOT 38,0:DRAWTO 38,68:PLOT 34,68:DRAWTO 38,68:PLOT 42,68:DRAWTO 38,68
2201 ? "EARTH:DIST. FROM SUN-149,600,000km:DIAMETER-12,756km:GRAVITY-1:DAY-23 HO
URS 56 MINUTES:YEAR-365 DAYS"
2202 GOSUB 9000
2203 COLOR 0:PLOT 38,0:DRAWTO 38,68:PLOT 34,68:DRAWTO 38,68:PLOT 42,68:DRAWTO 38
,68:POKE 764,255:GOTO 1045
2300 PLOT 42,0:DRAWTO 42,68:PLOT 38,68:DRAWTO 42,68:PLOT 46,68:DRAWTO 42,68
2301 ? "MARS:DIST. FROM SUN-227,392,000km:DIAMETER-6,794km:GRAV.-.38 OF E'S:DAY-
24 HOURS 37 MINS:YEAR-687 E DAYS"
2302 GOSUB 9000
2303 COLOR 0:PLOT 42,0:DRAWTO 42,68:PLOT 38,68:DRAWTO 42,68:PLOT 46,68:DRAWTO 42
,68:POKE 764,255:GOTO 1045
2400 PLOT 71,0:DRAWTO 71,68:PLOT 67,68:DRAWTO 71,68:PLOT 75,68:DRAWTO 71,68
2401 ? "JUPITER:DIST. FROM SUN-778,300,000km:DIAM.-143,200km:GRAV.-2.3 OF E'S:DA
Y-9 HOURS 55 MINS:YEAR-11.86 E YEARS"
2402 GOSUB 9000
2403 COLOR 0:PLOT 71,0:DRAWTO 71,68:PLOT 67,68:DRAWTO 71,68:PLOT 75,68:DRAWTO 71
,68:POKE 764,255:GOTO 1045
2500 PLOT 106,0:DRAWTO 106,68:PLOT 102,68:DRAWTO 106,68:PLOT 110,68:DRAWTO 106,6
8
2501 ? "SATERN:DIST. FROM SUN-1,427,000,000km:DIAM. 120,000km:GRAV.-.93 OF E'S:D
AY-10 HOURS 40 MINS:YEAR-29.4a E YEARS"
2502 GOSUB 9000
2503 COLOR 0:PLOT 106,0:DRAWTO 106,68:PLOT 102,68:DRAWTO 106,68:PLOT 110,68:DRAW
TO 106,68:POKE 764,255:GOTO 1045
2600 PLOT 183,0:DRAWTO 183,68:PLOT 179,68:DRAWTO 183,68:PLOT 187,68:DRAWTO 183,6
8
2601 ? "URANUS:DIST. FROM SUN-2,870,000,000km:DIAMETER-51,800km:GRAV.-.8 OF E'S:
DAY-15.5 HOURS:YEAR-84 E YEARS"
2602 GOSUB 9000
2603 COLOR 0:PLOT 183,0:DRAWTO 183,68:PLOT 179,68:DRAWTO 183,68:PLOT 187,68:DRAW
TO 183,68:POKE 764,255:GOTO 1045
2700 PLOT 270,0:DRAWTO 270,68:PLOT 266,68:DRAWTO 270,68:PLOT 274,68:DRAWTO 270,6
8
2701 ? "NEPTUNE:DIST. FROM SUN-4,497,000,000km:DIAM.-49,500km:GRAV.-1.15 OF E'S:
DAY-18 HOURS 30 MINS:YEAR-165 E YEARS"
2702 GOSUB 9000
2703 COLOR 0:PLOT 270,0:DRAWTO 270,68:PLOT 266,68:DRAWTO 270,68:PLOT 274,68:DRAW
TO 270,68:POKE 764,255:GOTO 1045
2800 PLOT 315,0:DRAWTO 315,68:PLOT 311,68:DRAWTO 315,68:PLOT 319,68:DRAWTO 315,6
8
2801 ? "PLUTO:DIST. FROM SUN-5,900,000,000km:DIAMETER-3,000km:GRAV.-.05 OF E'S:D
AY-6 E DAYS 9 HOURS:YEAR-248 E YEARS"
2802 GOSUB 9000
2803 COLOR 0:PLOT 315,0:DRAWTO 315,68:PLOT 311,68:DRAWTO 315,68:PLOT 319,68:DRAW
TO 315,68:POKE 764,255:GOTO 1045
9000 POKE 764,255
9001 IF PEEK(764)<>255 THEN 9005
9002 GOTO 9001
9005 ? "{":RETURN
```

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Jet is some spin-off

by Richard Gorham

Several interesting software products have been launched in New Zealand recently.

We will look at several in the next few issues.

Firstly, we'll give "Jet" a spin. It's the latest flight simulation from US software wizard Bruce Artwick, renowned for his previous work of art — the peerless Microsoft Flight Simulator.

SubLOGIC, Bruce Artwick's US company that specialises in high performance graphics hardware and software for the IBM PC, has recently released a High Speed Graphics System capable of drawing 100 million pixels per second.

At a retail price of US$ 2,990 this is claimed to rival dedicated graphics systems costing around US$ 40,000.

As a spin-off from this development, new techniques in graphics programming have been developed for the PC and are first seen in SubLOGIC's latest flight simulation program, the aptly named "JET".

Artwick's previous Flight Simulator (marketed by Microsoft and thus otherwise known as MFS) set a high standard for following simulation programs to achieve. The program provided a highly authentic real-time simulation of a single-engined Cessna ligh plane.

The only minor criticisms of the program have been the slow speed of graphics updates and lack of a choice of faster planes (real-time is OK if you're a serious flight buff — but 140 knots can get a bit tedious after a while).

JET, on the other hand, provides a choice of two supersonic jet fighters for free flight, dog-fight, or ground attack modes of flying.

The program runs on all IBM PC's (including AT and JR, and thus probably JX), requiring 128K and either an IBM compatible colour adaptor, or a Hercules mono-graphics card. IBM's enhanced graphics adaptor — EGA is also catered for.

Choice

The "pilot" has the option of F-16 Fighting Falcon ground based, or F-18 Hornet carrier based jets. Each has the capability of flying at more than twice the speed of sound.

Skill levels from 0-9 can be selected. Control is provided for undercarriage, radar, thrust, air-brakes, attitude display, weapon selection, weapon fire, 5-direction views out of plane (can be zoomed up to 8x normal), target selection, and auto- ranging display.

Control of the plane is by cursor-keys or joystick, if available.

These planes are both "fly-by-wire" machines in real life. That is, they have computers between the joystick and control surfaces to provide the pilot with a more predictable response.

Given that the F-16 has a thrust capability greater than its weight, and is thus truly ballistic, this is just as well! They would otherwise be non-flyable.

The result in real life, and in the simulation, is that all the pilot has to do is point the plane in the desired direction and the computer will do all the donkey work (unlike Cessnas and the MFS, where pilots had to really "fly" the plane).

H.U.D.

Instrumentation is in the form of a Heads-Up-Display (HUD) which is superimposed on the view out of the canopy.

Speed in Mach's, percentage thrust (including after-burner if in use), frame loading G force, altimeter, radar display, attitude, and range to target can all be displayed simultaneously.

Selection of free flight allows the "pilot" to practise take- off, flying manoeuvres, and landings without being attacked.

The enemy fly MIG 21 or MIG 23 jets.

Presumably the absence of nationality markings on all planes is intended to allow a certain cope for interpretation as to who is fighting what. Many nations around the world have access to the types of jets used in the simulation.

Dog-fight mode involves take-off from ground base or carrier, depending on plane selected, and attack and counter-attack with enemy aircraft using air-to-air missiles or cannon.

Luckless novices hit by the enemy's missiles can eject from the plane if they are quick enough.

After leaving the cockpit by this rather undecorous means, the survivor will be treated to the sight of their jet disappearing in a streak of flame.

They will then float gently to the ground, and be rewarded with a new plane (up to three planes per game).

Ground-strike mode gives "pilots" a number of ground or marine targets to attack with air-to-ground missiles or smart-bombs, and opposition coming in the form of ground-to-air missiles.

Quality of the graphics presentation is excellent, with realistic line-drawings of enemy planes, missiles, the ships. The speed of update is probably twice as fast as the MFS even on the standard PC.

AT speed

I also ran the program on an AT, and can report that the speed is not far short of most arcade games. This difference in speed spoils one silly, and dropping back to the PC's speed is dramatic proof of the difference between machines.

One of the strong features of the program is the option to view the plane from outside (at a fixed ground position) during flight — thus flying by remote-control.

This is a facility that I always wished for in MFS.

Watching take-off from the carrier's control tower certainly puts a different perspective on the whole event.

Another interesting point is the optional input of a variety of different scenery disks for use with the program.

It would appear that SubLOGIC have released several of these for use with MFS (all of places in the continental US), although I don't think any have surfaced in NZ yet.

However, scenery from the MFS disk itself can also be used, and I duly managed to load the New York scenery with the program and successfully flew between the World Trade Towers at Mach 2.2!

Bugs

On the negative side, I did find that the program seemed to have a bug or two at high altitude — the controls appear to reverse themselves at times (seemingly NOT due to "pilot" error!).

Overseas reviews of the program by experienced jet pilots have questioned the authenticity of both the ground taxiing and the supersonic simulation too.

However, the program is aimed more at the recreational market than at authentic flight simulation devotees — and will no doubt be a big seller in this area despite its rather hefty NZ$145 price tag.

The program's real strength lies in its ability to provide a coherent and challenging simulation for the "pilot" through its excellent graphics programming.

SubLOGIC will be hard pressed to surpass this one next christmas, my only hope is that it's a full space shuttle simulation (complete with space walk, please).

Until then SubLOGIC's "JET" should be a highly popular contender for the title of top PC game of all time.

Next month's review:

In a much more serious vein, next month's review is of a database manager package called "Reflex" (priced at only NZ$350).

Businesses at the crossroads

In this regular column we look at micro computers at work: at the software required for work-a-day tasks, and at the hardware employed to interface with spreadsheets, databases, project planners, accounting modules, communications facilities...

The research reports are from Phil Ashton, Brent Hill and Rob Clarke, who are d.p. consultants at MicroLab, a "neutral" consultancy established by the accountancy Kendon KMG, in Auckland.

The race to computerise is on, but where is the starting line?

A business manager, whether he be a sole trader or controlling an operation of substantial size, will at some stage face the question: Do I really need a computer; if so where do I start?

In the last two years the traffic at these crossroads has dramatically increased.

And there business managers have been befuddled by a confusing mass of directions from those who purport to know the computing path they should be on.

The business managers are at a disadvantage, because most have not travelled this route before.

And even after a fair reconnaissance of the computing options ahead, often they are confronted still by what seems to be a conspiracy of secrecy about the right way to establish computer systems.

What was needed was something like the AA (Automobile Association) to put travellers of this road on the right track — a group without vested interests in particular routes being chosen, except in ensuring that the various routes are faithfully charted and signposted.

In the world of computer options, one of the major accountancies has decided to fulfill this neutral, advisory role by establishing MicroLab as a computer consultancy which has no vested interests in whatever computer systems are ultimately chosen by those seeking directions.

Its consultants sell advice rather than hardware, or software, and claim to be objective and impartial when discussing the computing needs of any business.

Supercalc 3 — a better spreadsheet?

We've just got the latest upgrade from Sorcim/IUS, Supercalc 3 Release 2. For those of you who use Supercalc and even those that use Lotus, look out for Release 2 — it is a giant leap forward from previous versions.

We've been Supercalc users ever since the early days of CP/M — in fact we got our first taste of it on the tiny 5-inch screen of an Osborne.

At the time it seemed miraculous to have adjustable column widths and text that wasn't limited to cell widths — features that we had cursed in the original Visicalc on an Apple.

Since those days (only 3 years ago!) spreadsheets have dramatically improved, and Supercalc has been enhanced with many new features.

Supercalc 3 only runs on the IBM or compatibles, but includes graphics and data base management, just as Lotus does. But it wasn't as quick or easy to use as Lotus until Release 2.

With this new version Sorcim/IUS have added 8087 support, 9999 rows, and sparse matrix memory mnagement — which means you can have much more information in a spreadsheet before you reach your RAM limitations.

Another bonus included is "sideways" — a utility that lets you rotate a wide report 90 degrees for printing on continuous paper.

What's less obvious until you use this Supercalc version are the improvements to the user interface: improved help, redesigned screen (in colour) and, at last, quick use of the page up, page down, and end keys...all looking suspiciously like Lotus.

So if you're an existing Supercalc user, here's a viable upgrade.

Or, if you're looking for a top class spreadsheet, take a close look at Supercalc.

Its graphics are better and easier to use than Lotus (you don't need another disk), there's a much wider range of numeric format options, and it's cheaper — only $985. New Zealand agents are Arcom-Pacific.

But hang on, there's a new version of Lotus just released...

Sybiz Plus...a first glance

We have just had Sybiz Plus installed on one of our MicroLab computers. For those of you who know Sybiz, and there are many of you, the Plus version offers some significant enhancements, particularly in the general ledger area.

Do not assume however that Plus has all existing Release 5F features plus more, as Sybiz themselves have said that some 5F features are in the process of being included in Plus.

Before you make any decision to upgrade your software, ensure you are not losing any essential features already existing in your current system.

Our first impressions of Plus were favourable — the same screen layouts and approach but with extra options.

If Sybiz can create the stability with Plus as they have with version 5F then the business community will have a useful product.

Some of the features in Plus are:

- New view windows to enquire on or search for any account within any ledger at any time; creating added flexibility for the single-screen user.
- New calculator window offering the basic four calculating functions with the added advantage of directly loading the calculated result into Sybiz Plus.
- The general ledger is upgraded to include the ability to post into different accounting months, to allow entry of the full year's budget month by month, to permit standing journals and more informative reports.

Just a point worth noting here, and it wasn't obvious in our demonstration system: once the year end roll-over has been actioned there should be some control to prevent posting into prior years' months (ie last account year months).

- Open Item reporting on debtors statements has been tidied up and the statement stationery and layout improved. The posting of cash against open item invoices has also been streamlined.
- Invoicing has been enhanced to include a third selling price level (trade), customer/product discount percentages have been introduced on a limited basis and invoice printing can now be delayed from time of data entry so that all are printed in one batch. A significant development.

Note: We have compared Plus with version 5F from Sybiz although we are aware an upgrade to 5F is now available in the form of 5G. We have not yet seen 5G to comment on it.

'Perfect' but for some flaws

by Peter Biggs

The Perfect Software series consists of a number of modules including a word processing package (Perfect Writer), a data base (Perfect Filer) and a spreadsheet (Perfect Calc). Other modules available are a Communications (Perfect Link) and a Graphics package. They are marketed by Thorn-EMI.

The Version I series became popular for the Apple and Commodore micros and two of these have since been upgraded, in 1984, and are called Version II. Only Perfect Writer and Perfect Filer are reviewed here, along with a glimpse at Perfect Calc.

There are two packaged versions — one from the UK (available from Dick Smith Electronics Ltd) and one from the USA (available from Thorn-EMI: Software Sciences Ltd). Perfect Writer II and Filer II from the UK are the packages reviewed here.

The packages are boxed with an atttractive black, hard cover loose-leaf book containing the documentation and the discs.

Three discs are included in each package and none are copy protected.

This means that I could have made back up copies and installed them readily on a hard disc in the office.

Each disc comes with a tutorial and 'extras'.

Looking at the disc contents, it seems they have included as much as possible to aid the usefulness of their products — a feature some software houses could well emulate.

A Function Key template is provided with each program.

Both programs require at least 192K and two disc drives.

Each manual is about 400 pages long and are impressively readable and clear. Thorough and concise, they are also well written for first-time users.

I have an IBM PC compatible, a colour monitor and a hard disc with an Epson-code printer. Installation was easy and over in about 10 minutes, which included reading the documentation.

Perfect philosophy

Every program series has its own internal, hopefully consistent, philosophical approach to the user interface. Some make it difficult but many now try to make programs as user-friendly as possible.

In this case, Writer and Filer are both accessible from a common menu. This could be important in an office situation.

From this menu I could Write/Revise, Print a Document, Spelling Check, Calculate a Datasheet, Telecommunicate, File records, Document Utilities or Return to Operating System.

Two of these required Perfect Link and Calc.

The Document Utilities were very useful as they took the place of DOS commands to manipulate files and disc drives. Again, a nice touch and user-friendly.

Menu-driven

The programs are all menu-driven rather than command- driven.

In every case, menus are obtained by pressing the ESC(APE) key and selected from there. To select the function needed either the cursor keys can be used or the first letter of the function typed.

This method applies to all the menus throughout the Perfect Series. Each menu has a HELP screen invoked with '?'.

The most distant function was four menu-levels 'deep', which meant choosing from four menus to obtain the required function. However, this was infrequent and two menu-levels deep was enough for most common uses.

I found this approach excellent for starting up and quickly using the programs. I had staff use Filer and they appreciated the ease of using these menus because it gave them confidence in their ability to manage the program.

A Mouse can be used to 'pull-down' the menus but as I don't have a mouse I couldn't test its efficiency. I suspect reaching for mouse would be distracting but it could be fun.

Because this series is 'modular' I will talk about each program separately and then look at the overall effect of the two packages.

Perfect Writer

Perfect Writer comes with a Spelling Checker (of unknown number of words) and a Thesaurus of 50,000 words. There is also provision to create my own dictionary of words commonly encountered in my particular situation.

The 10 function keys are dedicated to some of the more common functions such as transposing and marking text.

I photocopied the Menu Tree from the back of the manual and just used that unless I really needed more. This was adequate for a long time.

I prefer to write with white on a blue background because it is less tiring so I tried colouring the screen.

A page can be 'painted' via menus but the colour disappears when the page is cleared. It seems a small point but I wonder why they bothered.

I gave up on the colour and settled for white on black — the unalterable default on this program. It would be no problem using a monochrome screen.

This is a WYSIWYG (What You See Is What You Get) word processor. Everything done to a page appears on the screen. With a bit of experimenting I very soon explored the main functions of the program.

I found all the features I would expect in a good word processor.

The 'cut and paste' option is fast. Page breaks can be inserted when required and the page justified on the screen.

Headers and Footers are readily set up as are page numbers for left and right hand pages (even and odd numbers).

When stuck for a word, I invoked the Thesaurus and inserted the chosen word, inserted directly into the text. This is a useful feature for writers.

I found it easy to work with, although the use of menus all the time to access functions was a little annoying after a while. It was either that or learning a set of commands.

I also could not find a way of going directly to a particular page of text without laboriously paging through the intervening pages.

This is a common fault of word processors that severely limit their usefulness for book work.

Document design

It is in document design that the program really stands out.

With care and patience I could set up the format of a form letter and quickly use this to write specific letters.

Many standard form letters are included on the discs. For example, I set up a "Thank you for your... I will... Enclosed is... I look forward to... Yours..." type standard letter and could quickly fill in the appropriate spaces.

A number of standard letters are included on disc.

All this and more is achieved using a command structure.

This structure is very powerful and with it I could readily produce a book.

I could set up Titles, Subtitles, Headings, Numbered Headings, Appendices,

(Continued on page 69)

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(Continued from page 67)

Index, Footnotes, Chapter Headings and many more specific design features.

There are also typeface commands such as bold, italic, roman, superscript, and underline. This alone would make it useful to publishers both large and small.

Some problems

I did find some problems. When editing a large document I needed to reconfigure a larger temporary workfile on the disc.

I only discovered this when I got an undocumented error message.

Also, when using the Thesaurus a number of times, the program came up with incomprehensible (and of course undocumented) error messages and I was unable to go further.

I finally got out of this but by then had corrupted the text itself. This appeared to come about because the program marks the text on the disc file.

A small point about word processors (and other programs): when I need to look at the list of documents I have saved on disc, I don't want to see all the program files a the same time.

I also need the files sorted alphabetically to save me searching through large numbers of files.

This is especially true of W P because in no time at all anyone will create a large number of letters and documents.

What I liked:

- It is user-friendly and a WYSIWYG (What You See Is What You Get) word processor.
- It has some exceptionally powerful features.
- The Spelling Checker and Thesaurus.
- The ability to mailmerge and print labels from Filer.

What I didn't like:

- The poor implementation of colour.
- No horizontal margin on the screen.
- The menus. After a while they are a mixed blessing.

Summing up:

A powerful, user-friendly word processing program.

Being menu-driven is excellent for first time or occasional users but could annoy really serious typists.

Using information from Perfect File to mailmerge letters and print labels is also a useful feature.

At $595 it's good value.

Evaluating the performance of word processing packages is difficult because they are very individual.

I would say that MS Word is less powerful though more elegant (and more expensive), PFS Write is more straightforward (although far less powerful) and Wordstar is more difficult to learn than Perfect Writer II.

If you are writing, this one is worth looking at.

Perfect Filer

Perfect Filer can be properly configured for colour so this pleased me to begin with; then invoking the program gave me the first menu.

From here I could Add more records, Sort, Search, Edit, Print records, Set up another file or use the files for mailmerging or printing labels.

The program is again menu-driven but this time it seems to be more convenient and appropriate. I think this is because I am not manipulating text, and using the menus seems safer and more error-proof than commands.

The program uses the files direct from the disc which means that the maximum file length is the extent of a disc.

However if a file became too large, the sorting, searching and editing functions would slow down considerably.

I would think that a useful file length would be no more than around 2000 records and if I needed more than this I would choose a more powerful database. This practical limit is satisfactory at this level.

True to form, I ignored both the tutorial and the documentation and started straight in.

I found the menu structure prompted me at every point in the process and I knew the documentation would be there to support me if I became lost. I didn't.

Friendly

The record length is fixed by what can fit into one screen. At most, 100 fields are allowed but in practice this crowds the screen entirely.

I set up a record structure with name, address details and a further 10 fields of information.

My staff, completely unused to computers, then entered some client data. With menus, the process was very easy indeed and they were taught in one session. After a few data entry sessions they were confident using it. They know that the menus are available to guide them.

I now use it for a client list and it behaves well. It is easy to use and I rarely consult the manual.

This program was immediately able to be used effectively with little learning, which is to its credit.

An interesting feature of Filer is the number of pre-programmed macros available to quickly set up a screen for data entry and recovery on a file. These are available on a utility disc and I can make up my own.

With Writer, I am able to mailmerge information with a form letter and print address labels quickly and conveniently.

Fatal flaw

The fatal flaw in this program is its inability to be able to add or perform any arithmetic operation on numeric fields.

Occasionally I would like to total a field labelled 'Books Purchased'.

I can't, and so this flaw seriously affects the overall use of the program as a database.

The only way this is possible is by transferring data to Perfect Calc (available for another $500).

This could be a significant consideration when choosing a database for your own use.

This is the only problem with it. So far it has been well- behaved, genuinely user-friendly and functional.

What I liked:

Everything. It had an ease of use that impressed me and my staff.

What I didn't like:

Its unforgiveable inability to at least add up a given field throughout the file.

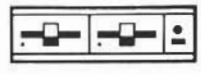
Summing up:

A good, friendly data base. It has limits on the number of fields and the useful number of files but this is usual for this level of database.

If you simply need a customer list for mailmerging and address labels, then this database is very good value at $495.

However, beware of its major defect.

(Continued on page 76



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Do-it-yourself BASIC

by Joe Colquitt

In this series of articles, I'll try to explain the workings of a computer and how you can use existing ROM routines to write your own BASIC.

If you're new to computing, you may not understand the method, but will still be able to use it.

There are many utilities that use redefined keywords, such as Paintbox, Plotter, Simon's BASIC, disk wedges etc. Many have the same principles, but different characteristics.

Some don't list properly, some have error routines, or are awkward to type in because of unergonomic keyword spellings, eg @PLOT is a lot easier to type repeatedly than !PLOT.

When we come to writing the new aditional BASIC routines, they will have to be in machine code, just like the keyword routines already in ROM.

If you've followed this ML column, you should be able to at least have a go at your own routines.

I'll be presenting a selection of routines to choose from, and making the system generally user definable.

In fact, just about any function can be assigned a keyword.

The keyword spellings I'll leave to you. I'd also like to get some ideas from you about what sort of routines you'd like to see.

At the moment, I've general ideas about keywords for sprites, sound, bit-mapping, screen editing, printer and disk commands.

To keep it brief, the main routine is given this month, with explanations and further keyword ideas in future issues.

The structure is quite simple if you look at it systematically.

The DATA statements are a fair indication of the layout.

What the new o/s does is to check if a token has a value of 204-254.

If it has, the new keyword is executed. If not, control is passed back to the normal BASIC system.

1) C008-C0FF new words table
2) C100-C1FF routine address table
3) C200-C2FF error message table
4) C300-C4IF operating system (o/s)
5) C420- new routines

To end Part One, below is the BASIC loader for the o/s and seven new words: LOC, BDR, BCK, TEXT, CLS, PAUSE and PAIR.

All seven are simple ML routines.

The '76' in line 100 is ASCII for 'L', the start of the keywords table.

You can change the words, as long as they are in the same order, and have 128 added to the last letter.

For instance, LOC as a keyword in the table is 76 79 195, not 76 79 67.

When you have activated the new o/s, the seven keywords are immediately available for use, on their own or with usual BASIC.

If you later load a program containing them (without the o/s) they won't work, and will not list properly.

Load the o/s to LIST or RUN.

If you run Program 1 before entering any of Program 2, you'll save yourself a lot of typing.

Erase lines 10-60 of Program 1 after the data lines have been compiled.

```
LOCx,y,z LOCate cursor at column=x,row=y and PRINT
         variable z or "".
BDRxx is to change the BorDeR colour.
BCKxx is to change the BaCkground colour.
TEXTxx is to change the foreground (character) colour.
CLS clears the screen
PAUSEnnn  delays nnn/60 seconds
PAIR(x) this function is the equivalent of:
PEEK(x)+256*PEEK(x+1), eg "PAIR(43)  2049
```

Program 1

```
10 L=188
20 PRINTCHR$(147);L;"DATA0,0,0,0,0,0,0,0,0,0"
30 PRINT"L="L+8:"*10GTO20
40 PRINTCHR$(18);:IFL<475THENPOKE198,3
50 POKE631,18:POKE632,13:POKE633,13
60END
```

Program 2

```
10 I=0:AD=49152
20 READML$:IFML$="-1"THENBY=49820:NEW
25 IFLEFT$(ML$,1)="N"THEN40
30 ML=VAL(ML$):IFML)=8THENPOKEAD+I,ML
35 SU=SU+ML:I=I+1:GOTO20
40 CK=VAL(RIGHT$(ML$,3))
50 IFCK<>SUTHENPRINT"ERROR":SU,ML,I:END
60 GOTO20
100 DATA18,185,150,185,203,185,237,185,76,79,X61543
105 DATA185,68,68,210,68,67,203,67,76,211,X62772
110 DATA68,65,73,210,80,65,85,83,197,84,X63784
115 DATA69,68,218,0,0,0,0,0,0,0,X64163
225 DATA0,0,0,0,0,0,31,186,84,186,X64650
230 DATA76,186,68,186,87,186,129,186,160,186,X66180
355 DATA8,0,73,78,68,65,76,73,68,32,X68731
360 DATA67,79,76,79,85,210,87,78,78,85,X67624
365 DATA77,888,18,82,78,215,0,0,0,0,X68312
450 DATA0,0,0,0,0,184,14,,184,20,184,X68828
455 DATA48,194,0,0,0,0,0,0,0,0,X69169
470 DATA0,0,10,170,188,182,194,133,34,189,X10279
480 DATA193,194,133,35,76,71,164,6,162,7,X11414
485 DATA188,4,3,157,167,8,189,0,198,157,X12374
490 DATA4,3,202,16,241,96,32,124,165,182,X13419
495 DATA0,188,4,138,15,189,0,2,133,8,X14062
500 DATA201,34,240,79,36,15,112,36,201,65,X15093
505 DATA144,34,201,91,176,36,132,113,166,76,X16040
510 DATA132,11,188,255,134,122,202,208,232,183,X17677
515 DATA0,2,56,248,8,182,240,245,201,128,X19190
520 DATA208,40,5,11,164,113,232,208,153,251,X20043
525 DATA1,165,251,1,240,54,56,233,58,240,X21962
530 DATA4,201,71,208,2,133,15,56,233,65,X22912
535 DATA208,178,133,8,169,0,2,240,223,137,X24281
540 DATA8,248,219,208,153,251,1,232,208,240,X26047
545 DATA188,182,236,11,208,185,7,192,16,250,X27421
550 DATA185,0,192,208,185,189,0,2,16,180,X28592
555 DATA153,253,1,169,255,133,122,96,16,4E,X29842
560 DATA201,255,240,38,36,15,48,34,201,204,X31104
565 DATA144,38,36,233,203,170,132,72,160,233,X32478
570 DATA202,240,0,208,185,0,192,16,250,48,X33315
575 DATA245,208,195,0,182,48,0,32,71,171,X35075
580 DATA200,245,76,243,188,76,238,188,76,26,X36503
585 DATA167,32,115,0,201,204,144,21,32,216,X37728
590 DATA195,76,174,167,233,204,18,169,185,1,X38141
595 DATA183,72,185,0,183,72,76,115,0,32,X40879
600 DATA121,0,76,231,167,188,0,133,13,32,X41021
605 DATA115,0,201,255,240,33,201,206,144,29,X42447
610 DATA58,833,208,10,72,32,115,0,32,241,X43446
615 DATA174,184,188,185,0,183,133,85,173,0,X44670
620 DATA183,133,88,32,84,0,76,141,173,32,X45628
625 DATA121,0,76,141,174,0,32,235,183,185,X46755
630 DATA20,24,201,46,176,15,168,224,26,176,X47825
635 DATA13,24,32,240,255,32,253,174,76,181,X49105
640 DATA178,189,1,44,189,2,76,240,184,32,X50282
645 DATA138,173,32,247,183,185,20,141,32,200,X51541
650 DATA88,32,138,173,32,247,183,185,20,141,X52788
655 DATA32,208,88,200,5,189,147,32,208,241,X54188
660 DATA88,185,81,72,185,20,72,32,247,183,X55182
665 DATA160,0,177,20,133,89,288,177,20,133,X56381
670 DATA88,184,133,20,184,133,21,188,144,56,X57276
675 DATA3E,73,188,95,32,138,173,32,247,183,X58478
680 DATA178,188,0,240,5,138,185,188,197,188,X59983
685 DATA248,252,208,245,224,0,240,4,208,76,X61582
690 DATA141,186,88,0,0,32,138,173,32,247,X62647
695 DATA183,201,0,208,31,133,90,192,16,178,X63885
700 DATA25,152,162,219,134,89,162,3,160,231,X65232
705 DATA145,38,136,208,251,145,92,198,89,202,X66812
710 DATA16,244,141,134,2,96,168,2,76,240,X67930
715 DATA194,X68124
720 DATA-1
```

'I need a robot'

Dear Editor,

I have a question that will interest many computer hobbyists.

I own a Commodore 64, and would like the computer to load a program (on disk or tape) as soon as it is booted up. This would be very useful in conjunction with a time switch. It could turn the computer on in the morning, load a program (eg MENU), then play a morning tune or show the day's timetable or something, without having to leave it on all night!

I can think of two ways to do this. Either construct a mechanical robot which physically types LOAD"MENU",8 <ret> — waits a while — RUN <ret>. This would take a lot of building (and therefore time, effort, and money).

Another alternative would be to program an EPROM and insert it like a cartridge into the back of the computer. Like a game cartridge, it could be activated on power-up, and automatically load & run the program.

I know very little about both methods. Can you help?

Marcus McLaren,
Wellington

I agree that a robot is overkill in this instance.

Apart from the time to build a dedicated robot, it needs to be programmed as well, and unless you had another use for it, that time would be better spent programming an EPROM.

The second idea is quite feasible and readily accomplished. A 2K EPROM like the 2716 would be enough, but they are about $40.

The process can be split into several operations, which will alternate between C64 ROM and the cartridge:—

a) the ROM routine at $FCE2 checks for a cartridge as soon as the machine is switched on. If one is found, it jumps straight into the cartridge, and does not do any initialisation of the C64. Therefore, provision has to be made for the initialisation to be done.

b) perform the LOAD.

c) RUN the program.

d) disable the cartridge. This will give you 8K ($8000-$A000) of RAM back.

OK, the first thing needed is a 'cartridge header'. This is a sequence of bytes that identifies an inserted cartridge:

$8000 .byte 09

$8001 .byte 80 = cold start (RESET) vector

$8002 .byte 09

$8003 .byte 80 = warm start (RESTORE) vector

$8004 .byte C3 = C+#$80

$8005 .byte C2 = B+#$80

$8006 .byte CD = M+#$80

$8007 .byte 38 = 8

$8008 .byte 30 = 0

When the $FCE2 routine finds a cartridge, it does the indirect JMP($8000), ie JMP to the address held at $8000.

What you need there is to make it go back into the C64 to initialise the computer, and when it has finished that, return to the cartridge to LOAD.

To do this, have a copy program at the beginning of the cartridge so that BASIC and KERNAL ROMs are put into the shadow RAM under them, and then switch the ROMs off.

Now you have a soft copy of the operating system, which allows you to change the relevant vector affecting continuation after initialisation.

So the code in the EPROM is as below.

I haven't tried this in an EPROM, but it works OK having the code as software loaded from disk, using:

10 C=C+1:IFC=1THEN-LOAD"CODE",8,1

20 SYS64738: REM $FCE2

A small program called "MENU" loaded and ran successfully.

If you look at p265 of the User Guide, you'll see the memory configuration needed.

Control of the EPROM's enable line via a transistor would allow you to use a signal from the User Port to switch it in/out, or you could try taking EPROM low by a pull-down resistor and a manual switch.

I would be interested to hear from anyone who has successfully accomplished this form of loading. If you have only a disk drive, this is about the only way you could load on power-up.

Loading from tape is a lot easier. Holding down the Commodore/Run-Stop key and pressing PLAY will load/run from tape.

The ROM routine at $E5E7 can't tell the difference between the Commodore key and Shift for the purposes of load/run, and will execute properly.

Because the Commodore key is depressed, the PAUSE at $E4E0 which waits for Commodore, Space or CTRL key will not occur.

The disadvantages are that the pinch roller is subject to pressure all the time the unit is unattended and any load errors will halt the procedure.

Using this method, however, you could load from disk. Have this program loaded from tape:

10 PRINTCHR$(147)"LOAD"CHR$(34)"progname"CHR$(34)",8:"

20 POKE631,19:POKE632,131:POKE198,2

When this runs, line 20 does some dynamic keyboarding, putting a HOME and a Shift/Run-Stop into the keyboard buffer.

After the disk program has loaded and run, the keyboard is inoperative, because of the non-release of the Run-Stop key. Dynamic key techniques will still work. Prog follows:

Joe Colquitt,
C64 columnist

```
$8000 09 80 09 80 C3 C2 38
 8008 30
 8009 LDY#$0C    ;copy routine
 800B TYA        ;
 800C STA$FA     ;
 800E LDA#$A0    ;
 8010 STA$FB     ;
 8012 LDA($FA),Y;
 8014 STA($FA),Y;
 8016 INY        ;
 8017 BNE$8012   ;
 8019 INC$FB     ;
 801B LDA$FB     ;
 801D BNE$8012   ;
 801F LDA#$35    ;ROMs off
 8021 STA$01     ;also store off value
 8023 STA$FDDE   ;in I/O KERNAL routine
 8026 JSR$E544   ;clear screen
 8029 LDX#$FF    ;perform initialisation
 802B STX$0316   ;
 802E JSR$FDA3   ;
 8031 JSR$FD50   ;
 8034 JSR$FD15   ;
 8037 JSR$FF5B   ;
 803A CLI        ;
 803B LDA#$4C    ;change this JMP in ROM so
 803D STA$A480   ;that after system prints
 8040 LDA#$52    ;'COMMODORE...BYTES FREE'
 8042 STA$A481   ;it jumps back into the
 8045 LDA#$80    ;cartridge instead of
 8047 STA$A482   ;printing 'READY.'
 804A LDA#$00    ;set 'direct' mode
 804C STA$A47C   ;
 804F JMP$E394   ;other initialisations
 8052 LDX#$00    ;clear screen and print
 8054 LDA$808C,X;LOAD"MENU",8
 8057 JSR$FFD2   ;
 805A INX        ;
 805B CPX#$0C    ;
 805D BNE$8054   ;
 805F LDA#$13    ;'home' into K/b queue
 8061 STA$0277   ;
 8064 LDA#$0D    ;
 8066 STA$0278   ;+ return
 8069 STA$0279   ;+ return
 806C LDA#$52    ;
 806E STA$027A   ;+ R
 8071 LDA#$75    ;
 8073 STA$027B   ;+ shift U
 8076 LDA#$0D    ;
 8078 STA$027C   ;+ return
 807B LDA#$05    ;tell K/b buffer
 807D STA$C6     ;6 keypresses waiting
 807F LDA#$E7    ;ROMs back in
 8081 STA$01     ;
 8083 JMP$A483   ;execute keypresses
data for print
8088 93 11 4C 6F 22 4D 45 4E
808C 55 22 2C 38 3A 00 00 00
8088 to 808E is the program name.
```

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Designed for all levels, it starts with installing and using Lotus 1-2-3, then moves through designing and using spreadsheets; formatting spreadsheets and making them aesthetically pleasing; generating printouts; working with oversized spreadsheets; graphics functions, data management; advanced spreadsheet applications and programming with macros. Attractive presentation includes many diagrams and graphs.

TAB: **Our price $31.70. Save $2.55**

Guide to using Lotus 1-2-3 Edward M. Baras

Detailed comprehensive guide to help you make full sense of Lotus 1-2-3's integration of spreadsheet, database and graphic functions. Includes step-by-step instruction on implementing practical application models for financial forecasting consolidating business statements, simulating dynamic processes, electronic forms management. Equally useful to beginners and experienced users.

Osborne/McGraw-Hill **Our price $38.80. Save $3.15**

Business Program Portfolio for your Apple IIe; An Integrated Office System
George H. Hildebrand

Collection of 61 BASIC programs covering such office tasks as interest calculation, financial analysis, depreciation, property management and real estate, cash receipts and disbursements, job cost, payroll. All programs documented for implementation and modification. There is also a guide to printing out business forms, creating a menu system, and securing business records with password programs.

Hayden **Our price $51.75. Save $4.20**

On-Line Computing for Small Businesses - Silver's Wall
Maurice A. Silver, John Jeacocke & Ray Welland

Sets out to provide managers of small businesses with a clear, concise but non-technical instruction in the use of on-line computing based on the pratical experience of the authors. No prior knowledge of computing assumed and only essential technical definitions are included.

Pitman **Our price $9.70. Save 70 cents**

The ABCs of 1-2-3
Chris Gilbert & Laurie Williams

Hands-on approach using detailed step-by-step instructions. Lessons involve tackling projects such as building a worksheet, displaying the worksheet as a graph, building a database, simplifying several operations using micros, performing calculations and printing graphs and reports. Remains a handy reference once you are familiar with 1-2-3.

Sybex **Our price $37.85. Save $3.05**

Taking care of Business with your Commodore 64 — David P. Dautenhahn

More than 100 brief BASIC and financial programs, each documented with a short explanation of what the computer will do and a BASIC listing. A real-life scenario follows, with a sample run and more instructions on how to combine two or more applications. Programs include: interest, depreciation, retailing, real estate, loan analysis, savings, lease analysis, time value for money, stocks and bonds analysis, sinking fund analysis, forecasting inventory needs, payroll, insurance, metric conversion.

Hayden **Our price $35.60. Save $2.90**

1-2-3 Run: 41 ready-to-use Ltous 1-2-3 Models — Robert & Lauren Flast

Collection of models that run on Lotus 1-2-3. Each model presented with a step-by-step description, complete listing, an illustration with sample data (you simply replace this with your own), and where applicable, instructions to produce bar and line charts. Designed to simply work, the models include applications for sales, accounting, real estate and the classroom.

Osborne/McGraw-Hill **Our price $38.80. Save $3.15**

Database for Fun and Profit — Nigel Freestone

For users wanting to do their own programming. Provides straight forward introduction to data processing, with explanations of routines in BASIC. Examples of system designs for home and business, which can combine and expand. Systems for names and addresses, catalogue index; diary; stock control; bank account/budgeting; debtors list/sale/purchase ledger; payroll.

Granada **Our price $18.45. Save $1.50**

Electron

Getting the Most From Your Acorn Electron
Clive Williamson

Comprehensive introduction to the Electron, exploring its potential and possibilities to suit each owner's needs. Intended to complement the user guide, and contains many tips on programming, software and the general use of the computer. Some features and accessories not documented in the user guide are investigated.

Penguin **Our price $14.75. Save $1.20**

The Electron Gamemaster
Kay Ewbank, Mike James & S.M. Gee

Programs structured so that each procedure, or module, performs a distinct task, allowing variations on the "core" program to be substituted. You also learn how to customise your own programs, improving your programming skills along the way.

Granada **Our price $20.30. Save $1.65**

Adventure Games for the Electron
A.J. Bradbury

Numerous examples and ready-to-run program modules in a book which lets you in on the secrets of professional games programming. Takes you through the whole process of writing an adventure, with a chapter on the type of instructions you are most likely to need. All programs in MODE 6 unless otherwise stated.

Granada **Our price $25.85. Save $2.10**

Apple

Getting Started With ProDos
B.M. Peake & D. Rorke

Aimed at Apple II and IIe users, this is needed for someone familiar with the existing Apple DOS 3 3 systems. Comprehensive guide to ProDos, with exercises for practice. Reference section goes over commands and comments on their use, and there is a discussion on the advantages and disadvantages of the system. A list for further references is included.

Bluewater Press **Our price $6.45. Save 50 cents**

Applesoft BASIC: A Teach-Yourself Introduction — B.M. Peake

Second edition revised to cover the Apple II Plus and IIe. A manual for New Zealanders to learn BASIC with the Apple, instead of picking information from two or three sources includes model answers. Enquiries for class sets welcome.

McIndoe **Our price $12.90. Save $1.05**

Fun, Games & Graphics for the Apple II, IIe & IIc. — Paul Garrison

Collection of more than 75 ready-to-run programs which you can use, study, modify, combine and experiment with. Complete listings written in standard Applesoft BASIC and CP M-Supported BASIC-80, and explanations. More than 20 financial and record keeping programs, and a wealth of graphics and education programs, a word processing organ and some small-scale database programs.

TAB **Our price $39.75. Save $3.20**

Ken Uston's Illustrated Guide to the Apple IIe

No-nonsense illustrations which allow the reader to master any application without reading the whole book. Self defined chapters deal with buying a computer, which Apple IIe components to buy, how to create a database, word process and perform spreadsheet calculations, how to tap into electronic information services, how to do fundamental BASIC programming, video games.

Prentice-Hall **Our price $35.95. Save $2.95**

Applied Apple Graphics — Pip Forer

Step-by-step introduction to graphics and their applications using BASIC. Suitable for Apple II, IIe and II-Plus. Covers hardware and software enhancements as solutions to graphic problems, in particular, reviewing the software utilities that can make BASIC programming pointless in some cases. Special disk, with 30 programs and 24 other files, is needed to understand many parts of the book.

Prentice-hall **Our price $66.75 (includes disk) Save $5.40**

The Apple House — John Blankenship

Explains how to compose your Apple to control your house security, lights, heat, telephone etc. This system allows the house to accept verbal commands and respond with its own voice. Shows how to build some items from scratch, and how to use some of the equipment you already own.

Prentice-Hall **Our price $41.50. Save $3.35**

Commodore 64

Cracking the Code on the Commodore 64
John P. Gibbons

Introduction to 6510 instruction set and how to combine the elements of machine code into commercial-style speed. Full machine code monitor with 14 commands gives you the tools to interface with the 64's architecture. Learn good programming practice and trade tricks while using the sprite, sound and hi-res graphics, and get to grips with the interrupt handling for multiple sprites and smooth screen scrolls.

Pan **Our price $24.95. Save $2.00**

Getting the Most From Your Commodore 64
Simon Potter

Uses diagrams, colour photographs, programs and examples to introduce you to the machine. Moves from starting through writing programs to graphics and sound, printers, disks, and extras and troubleshooting.

Penguin **Our price $12.90. Save$1.05**

First Steps in Machine Code on Your C64
Ross Symons

Clear concise explanation of machine code — introduction to the disassembler and its use; instructions for the 6510 chip with the aid of a demonstration program; discussion of the kernal operating system and its applications such as printing, input/output devices and scanning the keyboard. Two complete machine code games show you how to create your own high speed, animated arcade-like games.

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Data handling on the Commodore 64 Made easy
James Gatenby

Data processing — sorting raw facts to produce useful information — can be just as rewarding as playing games. Explains how to use the Commodore 64 to process information for the home and small business. Uses straightforward examples to demonstrate storage of large quantities of data, attractive and readable on-screen display, and searching and print-outs.

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Commodore 64: Basic Programs in Minutes
Stanley R. Trost

Collection of versatile, ready-to-enter programs for more than 65 home and business tasks on the Commodore 64. Programs for home finances, business calculations, real estate, data analysis record keeping and education. No knowledge of BASIC programming needed to use programs which can be entered and ready to run in less than 10 minutes.

Sybex **Our price $37.30. Save $3.05**

The Commodore 64 Experience
Mike Dean Klein

The many and varied uses of a home computer .. programs for the home (recipes, shopping, phone books, kitchen metrics, budgeting); education programs (maths, geography, spelling, languages, graphics); entertainment programs, business programs (appointments, cash flow, interest, cheque books, inventory); utility programs (sprite creation, charater design, memory loader, saver and clear, disk menu ideas). All programs can be modified.

Reston **Our price $31.80. Save $2.60**

The BASIC Explorer for the Commodore 64
Lee Berman & Ken Leonard

Combination of suspense novel and instructional text, it teaches introductory programming in BASIC. Elements of Commodore 64 BASIC and the thought processes that go into designing a computer program to solve a problem are introduced through the adventures of three modern-day explorers.

Osborne/McGraw-Hill **Our price $29.95. Save $2.40**

Commodore 64 Machine Language Tutorial
Paul Blair

Gets to grips with the intricacies of machine language programming, helping to overcome the demanding exacting and sometimes exasperating requirements. But master it and tasks such as sorting, searching and some graphics become much quicker. Judicious use of machine language also allows you to use larger and more complex programs. Demonstration program provided, with examples of short machine language routines.

Holt-Saunders **Our price: Book & disk $53.20. Save $4.30 Book & cassette $50.85. Save $4.10**

Language/programming

Structured Programs in BASIC **Peter Bishop**

Opens with a discussion of program structure and design. The rest to the book comprises example programs, with the complete program design process (from initial specification to final listing) carried out. Excellent source of programming techniques, algorhythms, program modules, ready-to-run programs and ideas.

Nelson **Our price $25.65. Save $2.10**

MS-DOS User's Guide **Paul Hoffman & Tamara Nicoloff**

Sets out to familiarise you with MS-DOS in all versions — IBM PC-DOS, and Versions 1.0, 1.1, 1.25, 2.0 and 2.11. Covers each computer running MS-DOS, gives the versions it runs and lists any improvements the manufacturer has made to the system. Complete information on software that runs under MS-DOS and products available to enhance the system.

Osborne/McGraw-Hill **Our Price $41.61. Save $3.35**

The MBASIC Handbook **Walter A. Ettlin & Gregory Solberg**

Concise, graduated tutorial to help you build programming skills for use in business, education and personal applications. Covers MBASIC tools; describes statements, functions, commands and sequential and random access files; debugging and documenting programs. Includes five fully documented business programs which can be customised.

Osborne/McGraw-Hill **Our price $40.75. Save $3.30**

The Second Book of Machine Language **Richard Mansfield**

Written for programming with Commodore 64, VIC-20, Atari Apple and PET/CBM computers, this book contains the powerful LADS machine language assembler. As well as being a sophisticated program, the book is a tutorial on how large, complex machine language programs can be constructed out of manageable subprograms. Extensive documentation provided.

Compute **Our price $36.95. Save $3.00**

The CP/M-86 User's Guide **Jonathan Sachs**

Comprehensive guide covering everything from Concurrent DOS CP/M-86 and Concurrent CP/M-86 to MP/M-86. Thorough explanation of commands, menu systems and files, then coverage of more advanced features such as DR Talk, DR EDIX or DR/Net. Advice on troubleshooting, full index and bibliography, and three machine-specific appendixes on the IBM PC and XT, DEC Rainbow and CompuPro.

Osborne/McGraw-Hill **Our price $41.60. Save $3.35**

Adventures With Your Computer **L.Rade & R.D. Nelson**

Easily followed activities include 16 chapters of adventure followed by 16 commentaries, providing solutions and guidance on how to program these solutions in BASIC. Avoids getting machine-specific or getting involved in dialects of BASIC. Programs usually given in a flow-diagram form, using minimal BASIC.

Penguin **Our price $9.20. Save 75 cents**

Games

Arcade Games for Your VIC-20 **Brett Hale**

A 15-year-old whiz kid from Victoria, Australia has put together a collection of 20 arcade games for the unexpanded VIC-20. All programs listed twice — once for a straightforward keyboard play, and once for use with a joystick. All games extensively play tested. Selection includes Galaxy Robbers, Yackman, Sub Attack, Fantasy, Pinball, Indi 2000, Leaper and Bullet Heads.

Corgi **Our price $10.10. Save 95 cents**

More Arcade Games for Your Commodore 64 **Brett Hale**

Collection of Arcade games by Australian whizz kid, 15-year-old Brett Hale. Games are in BASIC and can be modified to your wants. And they are listed twice — for keyboard and joystick use. Includes Speedy Boulders, Encircle, Yackman, and Barrell Jumper.

Corgi **Our price $10.15. Save 80 cents**

Arcade Games for Your Commodore **Brett Hale**

Fifteen-year-old Victorian whizz kid, Brett Hale has put together a collection of 12 extensively play-tested arcade games which are in BASIC and can be modified. Each is listed twice — for keyboard and joystick. Includes Tick, City Terror, Bricklayer and Surface Lander.

Corgi **Our price $10.15. Save 80 cents**

Virgin Computer Games Series **Edited by Tim Hartnell**

Each book contains a selection of more than 20 games which allow you to hine programming skills as well as have plenty of fun. Contains brief dictionary of computer terms, bibliography and hints on how to improve and extend some of the programs.

Commodore 64 edition $11.05. save 90 cents Spectrum, ZX 81, TRS-80, VIC 20, Oric Dragon, Atari, BBC editions $8.30. Save 75 cents Atari 600XL edition $14.75. Save $1.20

Tim Hartnell's Giant Book of Computer Games

More than 40 games compatible with Microsoft BASIC able to run on most micros, including BBC, VIC 20, Oric, Apple II and IIe, Commodore 64, Dragon 32, Tandy Color, IBM PC, Laser, TRS-80, PET, MZ80K and Spectrum. Range covers board, dice, space, brain and adventure games, simulations, artificial intelligence, and some just for fun.

Collins **Our price $13.80. Save $1.15**

40 Educational Games for the VIC-20 **Vince Apps**

Programs designed to help younger family members handle the VIC-20 and increase their general knowledge. Uses variety of games aids such as the beat clock, stop the hangman, race the buzzer. Subjects include geography, languages, mathmatics and science. Hints included to show how programs can be changed as skills improve.

Granada **Our price $20.30. Save $1.65**

Fantastic Games (Commodore 64 & VIC-20 editions)

Introduction provides instructions on running the games and the book ends with a section on how games are made. In between are Speedboat, Logger, Haze Maze, Getaway, Sub Attack and Snail's Trails.

Wingard-Hayes **Our price $7.95. Save 70 cents**

Space Adventures (Commodore 64 & VIC-20 editions)

Introduction provides instructions on running the games and the book ends with a section on how games are made. In between are Moonshuttle, Metor Shower, Protector, Alien Attack, Red Alert and Invasion — with a couple of sections explaining data and read statements.

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Compute's Second Book of Commodore 64 Games

Sixteen new worlds to explore... from photographing the Loch Ness monster to running a presidential campaign...to test your strategy, skill and knowledge. All ready to type in and play. Also articles on writing text adventure games and designing video games, and special-purpose programs to guarantee error-free program entry.

Compute **Our price $35.60. Save $2.90**

Tim Hartnell's Giant Book of Spectrum Games

More than 80 programs covering just about every sort of game imaginable — arcade action, mind benders, chance and skill, adventure, space, board and card, fun, simulations. And there are utility and demonstration programs, games to convert notes on error trapping and a glossary.

Collins **Our price $13.85. Save $1.10**

Spectrum

Cracking the Code on the Sinclair ZX Spectrum **John Wilson**

Practical machine code programming guide allowing the user to harness the full power of the Spectrum's hardware and escape the confines of BASIC. You are introduced to Z80 instruction set and learn to combine the various elements of machine code in commercial-like programs. Annotated example programs allow you to enter and use fast screen handling routines and sorts in your own programs, debug them with the trace facility, and run them with the on-screen clock. Covers ROM routines, interrupt handling and programming principals.

Pan **Our price $24.95. Save $2.00**

Adventures for Your ZX Spectrum **Clive Gifford**

Six ready-to-run adventure games — Crash! Pearl Diver, The Ring of Power, The Seven Keys of Tarkus, School's Out and Everyday Adventure — plus advice on writing your own adventures on a glossary and bibliography.

Virgin **Our price $13.85. Save $1.10**

An Expert Guide to Spectrum **Mike James**

Practical introduction to the Spectrum's advanced hardware and software features. Aimed at the user seeking a deeper understanding of the machine and its capabilities. Starts with an inside view of the micro, then moves to a connoisseur's guide to ZX BASIC and an introduction to the machine operating system. Covers ZX video tape system, RS232 interface, microdrive and advanced programming techniques. Complete program listings and projects for further exploration.

Granada **Our price $23.10. Save 1.85**

The Sinclair User Book of Games and Programs for the Spectrum

Sixty games and programs from the Spectrum magazine, Sinclair User; protect your castle from invading soldiers in Siege; test your three dimensional sense Labyrinth; improve your geography in Mapwork, face Mr Spec Trum on Wimbledon's centre court, run your own cricket test at Lords, jump a clear round in Olympia, play noughts and crosses against the computer, sink a submarine in Depth Charge, tackle a crash typing course in Touch Type.

Penguin **Our price $12.90. save $1.05**

Practical Spectrum Machine Code Programming **Steve Webb**

Designed for programmers who want to write faster and better programs than they can in BASIC. Assumes you have no knowledge of machine code and works through the details to the point where you are linking routines and using routines with BASIC programs. Questions throughout to test progress.

Virgin **Our price $18.05. Save $1.45**

The Spectrum Add-On Guide **Allan Scott**

Non-technical language used to explain what various peripherals do, how they ork and how you can use them in programs ... games, programming, business word processing or whatever. Detailed program listings for "best buy" in each section, and a complete adventure game that can use up to seven add-ons, including two network Spectrums.

Granada **Our price $20.35. Save $1.60**

Spectravideo

Games For Your Spectavideo **Damon Pillinger & Danny Olesh**

More than 25 programs including Minefield, Road Race, Star Strike, Towers of Doom and High Fighter. Plus a series of graphic demonstrations and a chapter on making effective use of the Spectravideo's sound.

Virgin **Our price $12.90. Save $1.05**

Keyboarding

Keyboarding for Information Processing **Robert Hanson**

Enables a person to develop basic touch keyboarding skill in a minimum time. The person who completes the book will be able to key in alphabetic, numeric and symbol information, input numbers on a separate 10-key pad; keyboard information quickly and accurately; understand some of the basic vocabulary used in keyboarding. Can be used for classroom or individual, self-instruction.

Osborne/McGraw-Hill **Our price $14.75. Save $1.20**

Quick Keyboarding **Vonnie Alexander**

Sub-titled "Component Keyboarding in 6 hours", this book by New Zealander Vonnie Alexander has a unique method for teach-yourself competent keyboarding. A wall chart of finger positions is included.

Methuen **Our price $7.35. Save 60 cents**

General

Graphics Compendiums — editions for Spectrum & Commodore 64 **David Durang**

Useful graphics designs and programs, including large library of pre-defined graphics characters, easy-to-use programs for designing and loading of your own graphics, special sections on graphic effects and animation techniques. Plus a selection of graphics games.

Pitman **Our price $18.45. Save $1.50**

Computer Bits and Pieces **Geoff Simons**

This compendium of curiosities is an informative, amusing and entertaining — and somewhat disturbing — account of the wide-ranging activities of computers...their uses in science and research, creativity, transport, industry, offices and administration, medicine and health, monitoring the environment, education and training, games and entertainment, the home, and the future.

Penguin **Our price $11.95. Save $1.00**

(Continued from page 69)

Perfect Calc

I have glanced at Perfect Calc but have had no chance to investigate it further.

It is again menu-driven, but the screen display is not up to the professional standard of Lotus 1-2-3 or Multiplan.

I presume it works but I have been spoiled by better software.

If it was needed to use with the database it would be adequate but otherwise I would look for a more professional implementation.

Overall

Perfect Software Inc (USA) have done a good job at producing modules which can stand alone yet can integrate where needed — yet it seems each module has a significant flaw.

For me it is the need for proper colour implementation and a menu override in Writer.

And for Filer to be able to at least sum numeric fields.

The extent to which these are important depends on the task required of them.

They are both excellent value for money if these defects do not affect your needs.

Software summary

	Perfect Writer II	Perfect Filer II
Ease of Use	4	5
Getting Started	5	5
Manual	5	5
Memory needed (min)	192K	192K
Copy Protected	No	No
Tutorial on Disc	Yes	Yes
Max file size (approx)	30 pp	disc capacity
Useful file size	15 pp	2000 records
Each record	—	100 fields max.
Value for Money	5	5
Cost	$595	$495

Available from Dick Smith Electronics Ltd. UK version reviewed.

Classifieds

System 80 Computer for sale. 48K memory. Blue label model. Plenty of software, including utilities, games and word proc., host of documentation, $300. Richard Still, 3 Hinton Rd, Taradale. Ph. 449-258

Epson HX-20 with expansion unit, micro cassette drive and the monitor display interface with few programmes and books for immediate sale. $1300.00 or o.n.o. Please write to: Sarath Gunatunga, Medical Centre, Opunake. Phone 8738 during office hours only. Genuine reason for sale. Had very little use.

Vic 20, 7 yr old wants Penpal, anywhere in N.Z. any age. Richard Hay, 8 Suffolk Street, Ashburton.

Apple compatible, 80-col, Z-80 card, double disk drive, monitor, 70 disks, $2200 or $3200 with printer, negotiable. Phone (070) 796-029.

PANASONIC JR100 SOFTWARE for sale. High standard. Send SAE to: A. Somerville, 72 Aberdeen Rd, Castor Bay, Auckland 9.

7 programs for the 16K ZX81 on 1 cassette! only $5. Send to: S. Atkinson, 36 Atawhai Drive, Nelson.

ProGames 65 Winston Street, Wellington 4, New Zealand. Phone (04) 792-666

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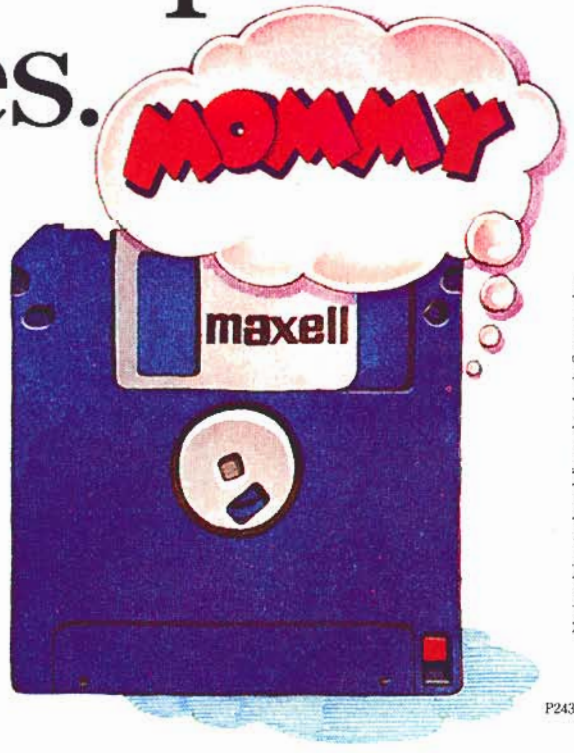

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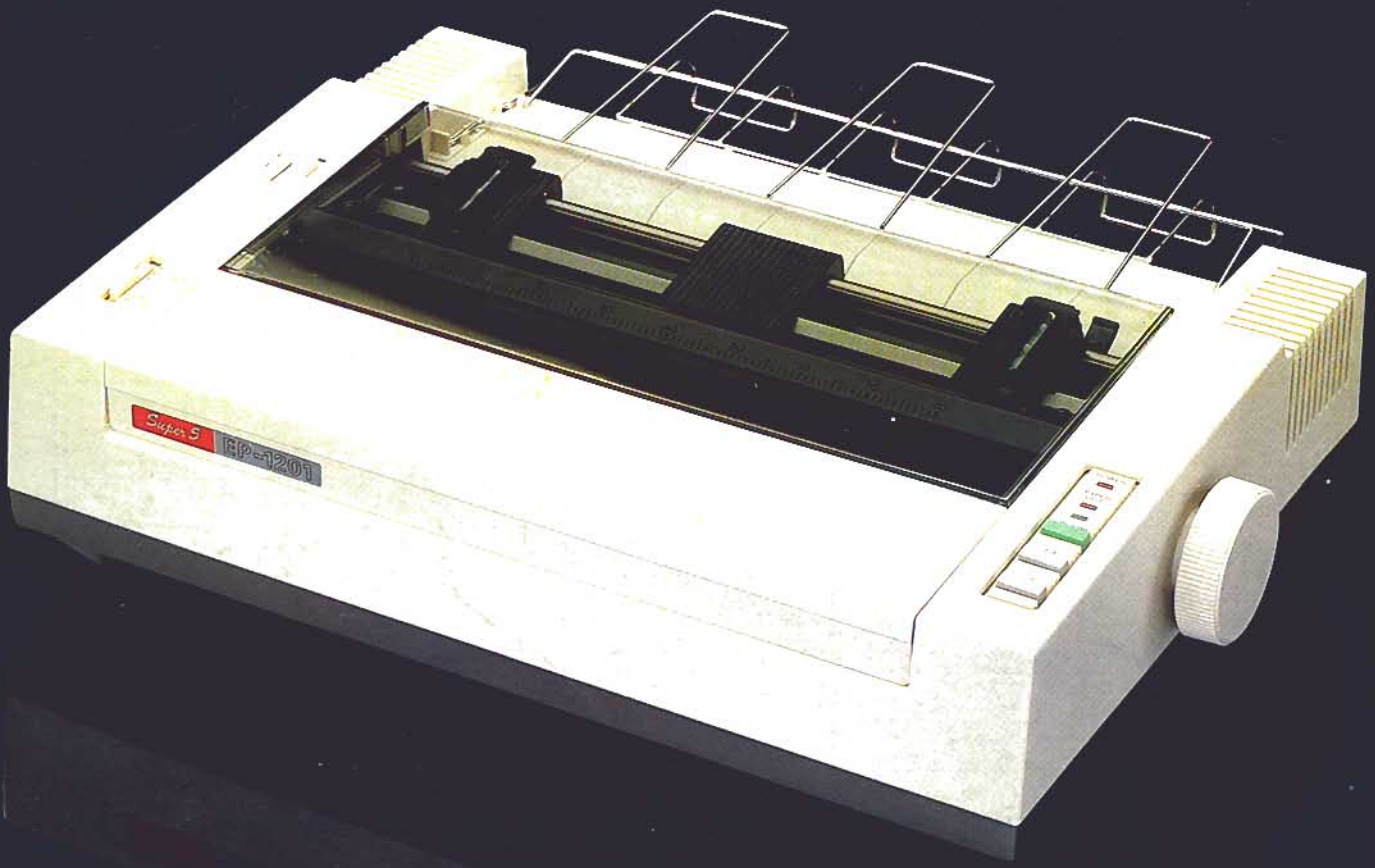

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