NEW ZEALAND'S PERSONAL COMPUTER MAGAZINE

BITS & BYTES

September 1985: $2.00

Computex –
NZ videotex service launched

Reviews:
MSX – from Sony and Yamaha
JAZZercise for the Macintosh
Online databases in NZ
Micronews: PC prices drop
Columns for popular micros

The MZ – 5600 Series from Sharp.

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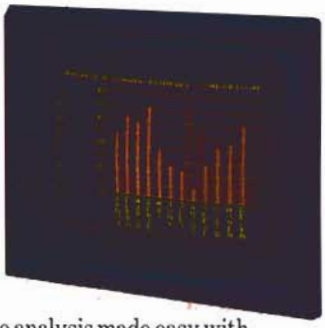

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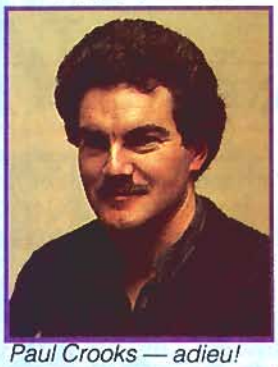

Paul Crooks — adieu!

Gaie Ellis — Managing Editor

Steven Searle — Editor

Paul Harris — Auckland Sales

Shona Wills — Artist

Happy birthday to us

Welcome to the third birthday issue of Bits & Bytes. It seems like a long time ago when Neill Birss, myself and a couple of willing helpers put the first issue of the magazine together in a weekend.

We had no way of knowing then how the magazine would be received and certainly none of us dreamed it would grow to 96 pages and a circulation of 12,000 copies in three years — we were too busy twisting people's arms to write articles to fill the first issue!

Significantly many of those original contributors are still tapping keyboards to produce articles for Bits & Bytes.

People like Gordon Findlay, Pip Forer, Selwyn Arrow, Gary Parker, Shayne Doyle, and more recently John Slane, Peter Ensor and others, have produced many excellent articles for only small financial reward. Without their tireless efforts there would be no Bits & Bytes.

The same applies to Dion Crooks, who joined Neill and I soon after the magazine started and for the last three years has guided it through its hectic (and at times chaotic) production stages every month.

Finally I would like to thank those in the computer industry who supported both morally and financially, the concept of Bits & Bytes from its early days. People like Mike Cooch at Commodore Computers, John Seymour at ANZ Books (now part of Reed Methuen), and Raju Badiani at Einstein Scientific.

By chance our third birthday coincides with some of the biggest changes at Bits & Bytes.

I have decided it is time to catch up first hand with developments in the world of computers, computer publishing and Videotex. So by the time you read this article I will be in Silicon Valley checking out the problems the American microcomputer industry is reportedly having and soon after I will be visiting the London Computer Show. Later I hope to attend the huge Hanover exhibition in Germany and see what is happening in Japan.

While I'm away I will be filing regular reports for Bits & Bytes on overseas happenings.

The magazine's administration will be left in the very capable hands of Gaie Ellis, who has been with Bits & Bytes for 18 months, the last six months as editor.

Taking over as editor is Steven Searle, an experienced journalist who was editor of Management magazine before becoming a freelance journalist. His articles have appeared regularly in Better Business, Marketing, Asia Banking and other publications since.

Editorial advertising and production for the magazine is now centered in our new Auckland offices but the Christchurch office still handles all subscription and book club work. Our new videotex service, Computex, is based in Christchurch with Jeff Whiteside as general manager.

Finally thanks to all those readers who have supported the magazine over the past three years. The magazine has changed in that period and will continue to change (magazines that don't change die). But our circulation figures and reader feedback indicate we are continuing to keep our readers interested. We hope that Bits & Bytes will continue to interest you for at least the next three years as well.

by Paul Crooks

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A 20 Mb 'Kaypro clone'

Kaypro distributor Hitec Micro, in Auckland, is also meetingt the computer market's "price sensitivity" with the introduction of two new PCs, one being a "Kaypro clone" called the President.

Hitec manager Phil Lomax says the Kaypro 4X is now superceded by the 2X, the same machine but with a real-time clock included, and a lower price at $4590.

That's $200 cheaper, but the 2X does not have dBase II included — a set-back which Hitec is trying to put right by talking to the local dBase distributor.

Meanwhile Kaypro's New Version 2 was released recently, with Wordstar, to catch the eye of PC buyers looking for dollar-value — it retails at less than $3000.

Main competition for the single drive machine, of 400Ks, is regarded as being the Bondwell, although Lomax has noted most of his Kaypro sales have been pitched against potential IBM buyers.

The President system, a 20 megabyte hard-disc PC, with two floppy drives, is directly pitched against IBM machinery and Lomax considers its big feature being the price, $9250.

The deal includes Open Access software.

It was put together by President Computers in Sydney, a former Kaypro distributor, which has apparently found agreement with Kaypro to produce a "clone" a rung above the US manufacturer's present top range product, the Kaypro 16. Both the 16 and the President are IBM compatible.

At the same time as President Computers relinquished its Kaypro distributorship, Kaypro US was establishing its own direct presence in Sydney — a move which Lomax says will avail quicker access to spare parts and other servicing requirements of New Zealand clients.

'Serious' marketing

The reason given by Tandy US for dropping prices of its PCs 30 percent in Australia and New Zealand was that it was being "serious about off-shore markets".

The price drop did not reflect a need to push more stock, says Tandy's Auckland distributor, Computer Advances.

Managing director Keith Redit says local sales have been at a satisfactory level — an extra salesperson was being sought last month to look after the company's Greenlane showroom, and an extra engineer.

The IBM compatible Tandy 1000 was finding favour, at $3825, as an intelligent, high resolution receiver for videotex lines.

It has been ordered in bulk for this purpose by a computer bureau wanting to place videotex terminals at subscribers' sites, says Redit.

Meanwhile he reports the 16-bit Tandy 2000 recently being placed with a major timber-based group as terminals for a computer-aided-design system.

P.O.'s computer phone

The Post Office's "computer phone" was demonstrated at the Systems 85 show last month, but the ICL One-Per-Desk PC with built-in phone modem will not be launched for sale until "near the year's end".

Up until then further demonstrations of the unit will be organised, according to NZPO Telecom marketing spokesperson Beryl Piers.

A review of Computer Phone will feature in next month's issue.

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Partner more approachable

Also among the price-cutters is F&P subsidiary MEC Ltd, which announced at the Systems 85 show $1000 being lobbed off the Panasonic Senior Partner, now selling for a shade under $5000.

The same applied to the hard disc version, dropping 'a grand' to $8495.

MEC national sales manager Brian Grounsell, says the drop was not due to falling sales, that in fact sales were bouyant — but that the new prices were to reflect more competitive pricing by the Japanese supplier, Matsushita.

"We believe Senior Partner is now the leading IBM-compatible portable in terms of sales, and the low pricing makes us even more competitive," says Grounsell.

The built-in printer, the Cashlink software, and the reliable backing of an F&P company was attracting both corporate and small-business users, he says.

Grounsell added that Partner's sales had been double the year's target.

Where's the explosion?

Data General revalued downwards by 30 percent its portable DG One about four months ago, and although sales have moved ahead of targets the predictions of further market uptake remain conservative.

Data General spokesman Doug Barr says "we have yet to see the explosive growth of the portable market that everyone was predicting in the US".

He says that buyer preference appears to be remaining with more robust-looking and fixed machinery, especially for business environments.

Reasons for the price reduction, says Barr, were mainly the lower pricing of US supplies, and secondly the strengthening Kiwi dollar.

Initial sales targets were conservative, he says, because the DG One was DG's first venture into that particular market.

Early last month DG's Dasher One series was launched in the US, a series of intelligent work-stations featuring single floppy drives of 720Ks and supported by Connect software designed for network systems. Units will eventually sell here for about $6500.

Bondwell Vs IBM

In late August the Bondwell IBM-clone '30-series' was to be launched here by distributor, Orchid Trading co.

Orchid says the Bondwell's US and Hong Kong suppliers claim full compatibility with IBM PCs — that it can be plugged into an IBM network without any problems.

Orchid Trading's general manager, Barry Angus, says the 16-bit MSDOS Bondwell is ludicrously cheap at $6450, and this was a significant reason for dropping prices of the existing Bondwell range of PCs.

The Bondwell 12 and 14 came down $500 and the 16 came down $1500 to $6000 — the latter having the same 10 Mb hard disc drive which is featured also with the IBM clone.

Angus says hard disc machinery has dropped rapidly in cost.

To add impetus to the price cutting strategy and the new launch, Angus has been endeavouring to arrange wider distribution by seeking agreements with two electronic retail chains — one based in Auckland and the other in Wellington — without trading on the toes of 50-odd dealers already selling Bondwell PCs.

He predicts a rapid market uptake because the new machinery undercuts Sanyo, the current leader in the low-price MSDOS market.

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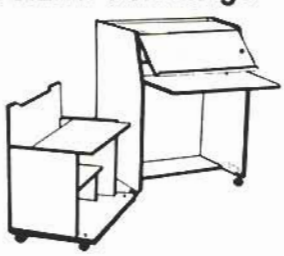

DATA CENTRE

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Amstrad computer & Panasonic printer. Room for disc drive and Joystick.

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Same Amstrad setup with Copy-plate in position.

MULTI +
Macintosh, printer and extra disc drive. Top shelf set to give ideal screen height.

One Megabit Chip Close

The high capacity one megabit memory chip, now under development by many computer companies, will be commonplace within two years according to Dr Osamu Nakahara, one of the key development executives of Sanyo Computers in Japan.

Dr Nakahara, who was in New Zealand for technical discussions and new product information talks with executives of Sanyo Business Systems, believes there will be several developments in the immediate future. "A one megabit chip capable of being produced commercially, is now under development by our own company and by others, and I believe it won't be long till it's ready," he says.

"Two or three years from now, one megabit chips will be as common as our 256Kb chip is today."

Sanyo's latest computer will be revealed at a computer show in the United States in November and Dr Nakahara expects it will be a strong challenger to IBM's AT computer.

"In our experience, it is important in the international market to be compatible and competitive with IBM, so it is natural for us to have the products to enable us to compete."

While price appears to be becoming a major factor in the computer market, Dr Nakahara believes enhancing the features of computers is still more important. "Innovation is still important in developing and maintaining position in the market."

Regarding IBM's JX computer, launched in Japan last October, he feels it is well supported with software and competitively priced, but not a real threat to Japanese manufacturers.

The Amiga push begins

Amiga was its launch early last month in the US, with a US$40m promotional budget behind it for the next 12 months.

Its price here will be between $4000 and $5200 when launches next January or February. In the US its launch price was US$1295.

In Auckland, Commodore Computer's managing director Dick Anderson says he will be distributing a UK version of Amiga, but the UK launch is not until early next year.

He reports rave previews of Amiga, taking the front cover of Byte magazine, and being lavished with such descriptions as "a likely upgrade for current Apple II users".

At a Melbourne computer show this month Anderson and Commodore colleagues will have their first hands-on experience of the Amiga, which runs on the Macintosh chip, the Motorola 68000 microprocessor.

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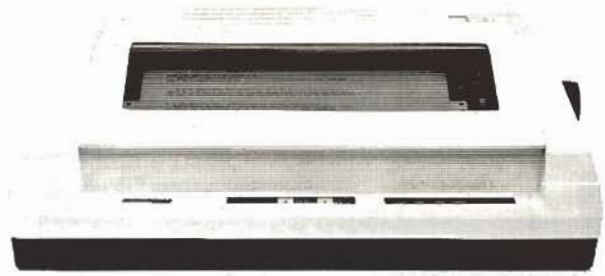

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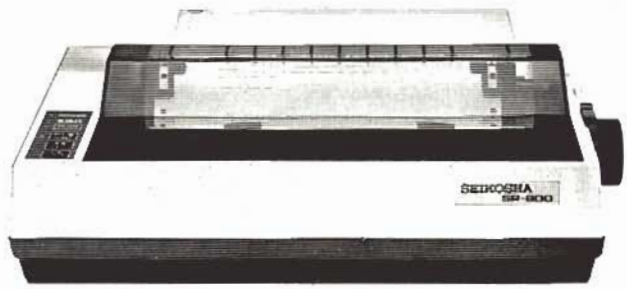

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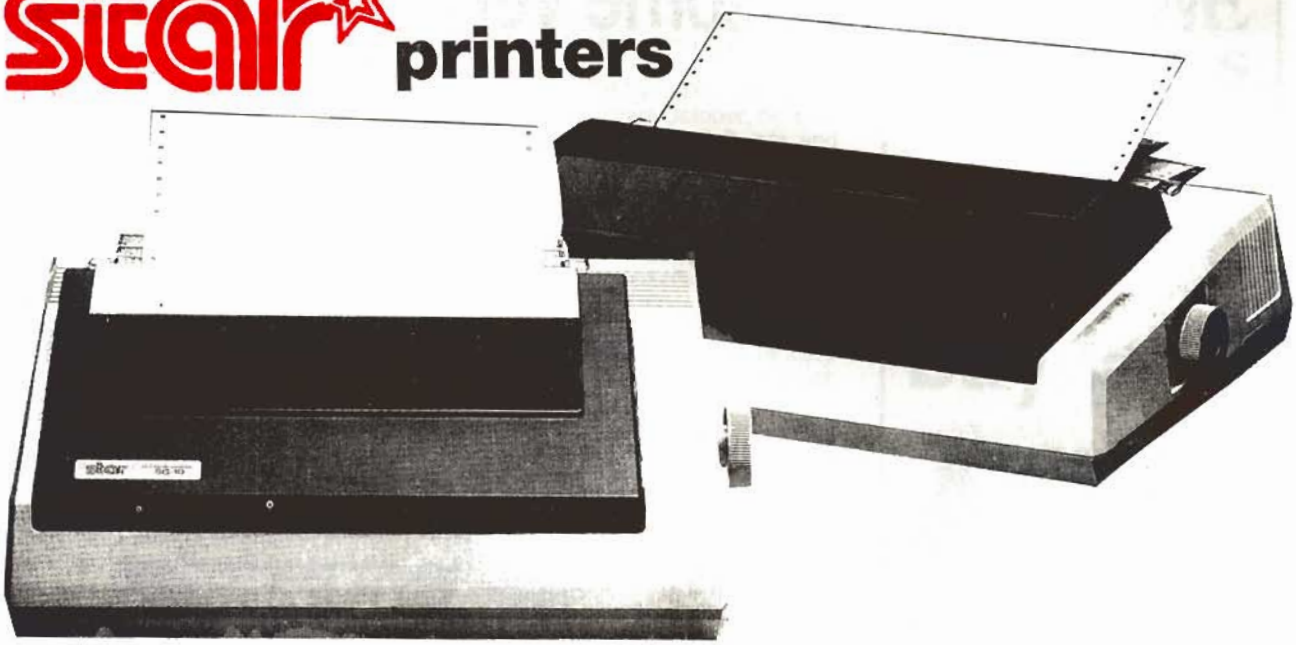

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First past the post: Jazz

by Pip Forer

Jazz is the new integrated software package from Lotus, creators of that pioneering MS-DOS staple, Lotus 1-2-3, and the more comprehensive, if less acclaimed, Symphony. By a short head Lotus has beaten its competitors to producing the first integrated package for Apple's Macintosh and has a product which boasts five functions-spreadsheet, data base, word-processor, business graphics and telecommunications — all virtually simultaneously available.

Excellent software for each of these applications on their own is already available on the Mac, and as John Vargo has shown at length such integrated program environments are not unusual on established MS-DOS machines. However, this is the first integrated product (by a short head) for the Macintosh.

A review of Jazz has to make at least two comparisons: is Jazz a cost-effective alternative to buying individual software components for its main operations and does the Jazz/Mac combination stack up well against MS-DOS products?

The second question is itself composed of two aspects: raw power and effective power. The great advance offered by the Macintosh as a computing system is its friendly environment, which aims to ensure a low learning cost for new users. Anyone who has worked with MacWrite or MacPaint will know that with such simpler software the hurdle to new users is a low one indeed. Does the same hold true for a more complex piece such as Jazz? This is an important question since the ability for the novice or occasional user to 'just sit down and go' may determine how practically effective software can be in real situations. Does Jazz measure up to the capabilities of the Mac operating environment?

To cover all the aspects of Jazz this review is in two parts. The first part evaluates Jazz on its merits for the first-time user. Is it really a simple-to-use executive and small business tool? The second part will look a little more closely at how it compares with its rivals: existing integrated systems and alternative, special-purpose software.

First notes

Jazz comes packaged with four disks, two significant manuals and several summary aids, plus some storage wallets for shelf use. It requires a 512k Macintosh with twin disks, taking just under half the available RAM for its program code. The manuals consist of a large reference text and a smaller tutorial guide which is linked to example files on a tutorial disk. The first-time user is recommended to study these first, and they do provide a cogent introduction to the system. The documentation is high quality, making good use of screen images of various menus and layouts encountered in operation.

A single red folder instructs the user how to start the system. Since this amounts to feeding two labelled disks into two clearly distinguishable disk drives, waiting, then pointing an arrow at a large icon saying 'Jazz' and clicking the mouse button this is quickly accomplished. In Macintosh tradition the bulk of the interaction with the screen is mouse driven and this adds considerable facility to many operations.

After starting the system the user is faced by a menu which allows them to open old or create new files. Each file represents a single document, displayed as a window on the screen. Jazz presents a menu to the user, when loading, of either ALL Jazz files on the current disk or just those of a given type, for instance spreadsheet, graphic or data base. From here on in the user has a wealth of options open to them.

Using the Components

As a test of Jazz's self-driving style I disciplined myself to forego the manuals and work by instinct as I tried to create a sample application. My background as a geographer is that I work regularly with word-processors, frequently with the Multiplan spreadsheet and intermittently but feverishly with data bases. In general I know what I wish to achieve, and I have experience with other systems. However the commands of Jazz were new to me.

I started by writing this review as a document under the word-processor. The word-processor is a full-blown, middle range one, very 'what you see is what you get' and well pitched for report writing. It has access to the various fonts and styles that the Macintosh supports and allows the inclusion of diagramatic material, of which more later. Apart from doing a few things in different ways it is very similar in strengths and weaknesses to Macwrite apart from being a little slower on cut and pastes. Its main benefit is its integration with other components of Jazz, particularly through a facility known as 'Hot Views' which establishes a dynamic link between different files.

Performance benchmark

At this point it occurred to me that if I were to benchmark Jazz's performance in some way I should keep a record of how long certain opportunities took. I therefore pulled down the **FILE** menu and selected NEW and Spreadsheet. This implemented a new window for me, this time into a spreadsheet. I was now able to swap between report and sheet by pointing at a portion of the document I wished to be currently active. My first note was that swapping between windows took about 2-3 seconds to complete. That spreadsheet remained permanently available as I tried new options out. I also opened a second word-processor document, this time for notes on good and bad features I chanced upon as I worked through Jazz.

All Jazz documents remain simultaneously on the screen, with one active one on top. Unless the user chooses to fill the screen with this one by zooming it up then peeking edges of the others are artfully kept in view by Jazz and pointing to part of one makes it active and brings it to the fore (screen 1). If you can not see your document a pull-down menu of currently available documents allows you to select a new active one (the **Windows** menuy on the bar at the top of screen 1).

Windows can be full screen or be artfully arranged so that several are visible at once (screen 2). Here I have deliberately shrunk the documents and scattered them about to see what is on offer. The menu bar at the top reflects the currently active window, the spreadsheet one, and alters for other applications.

The spreadsheet is a well-thought-out implementation. All selection of areas for copying or replication is done by pointing with the mouse and all cell references for formulae can be constructed by pointing at the desired point or range on the sheet. Compared to cursor-driven spreadsheets navigation around the sheet is simplified by scrolling controls and 'navigator' icons which allow movements to page breaks or certain extremities of the sheet with great ease. Operations are fast and the range of functions available are impressive. Functions for formulae can be reviewed for the absent minded from an on-board list and pasted into equations.

My favourite touch is setting column width, which is done by using the mouse pointer to visually drag the column to chosen size. Extension of long label entries across into unused adjacent columns is automatic, truncation is signalled by literary dots! There are a few features absent found on other sheets (for instance Multiplan's and Viewsheet's ability to link to other data via disk files) but in general the spreadsheet earns high marks.

(continued)

Graphics and 'Hot Views'

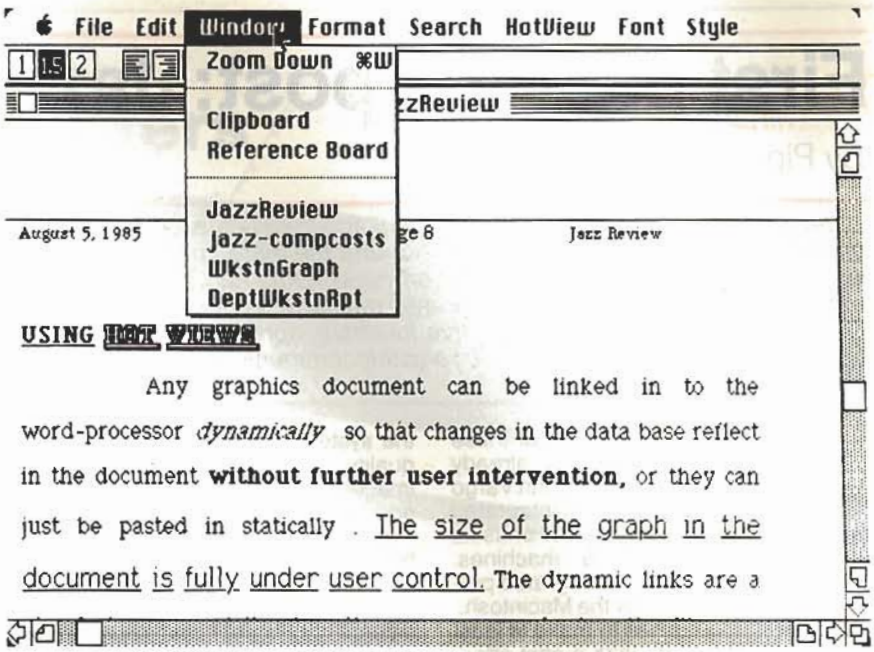
The spreadsheet links in to the graphics program in a simple manner. The information to be graphed is selected by pointing the mouse cursor at the first value to be graphed and then dragging across the range of values. The user then creates a graphics document and includes this data in it. Labels can also be brought across from the spreadsheet using the same procedure. All the procedures for creating and editing graphs are simple to use, although a few of the editing procedures are a little clumsy (you tend to get a lot of redrawing). The range of charts is suitable for business use. Several variables can be linked in to a single graph as compound or offers bar charts for instance or as line graphs overlain on bars. Labelling can be in any or all available fonts. Incidentally, graphics displays can be also be created from the data base environment.

Any graphics document can be linked in to the word-processor *dynamically* so that changes in the data base reflect in the document without further user intervention, or they can just be pasted in statically. The size of the graph in the document is fully underuser control. The dynamic links are a nice feature, especially since they are preserved when the files are saved. Template reports that include graphics are easily designed and saved in this way. The only cost appears to be a slight decline in speed when using the spreadsheet.

The final working component is the data base. This facility allows information to be structured in the more rigid format of a simple data base. It is a relatively simple data base in that the initiate of Dbase II or relational systems will find Jazz lightweight. However for most uses it is more than adequate and any limitations are counteracted by the flexibility of the system.

In the data base the data can be viewed either as a series of records (rows) each composed of fields (columns) or in a form layout. In the former case the information looks like a spreadsheet: it is less well labelled then when displayed as a form, but more of it is visible. The form facility provides a 'front end' for viewing a single record at a time, along with labels, explanatory text etcetera. The fields of each record can be displayed in any order desired, using alternative fonts and styles and with some fields suppressed if desired. Effective field designs stressing important fields are easily achieved.

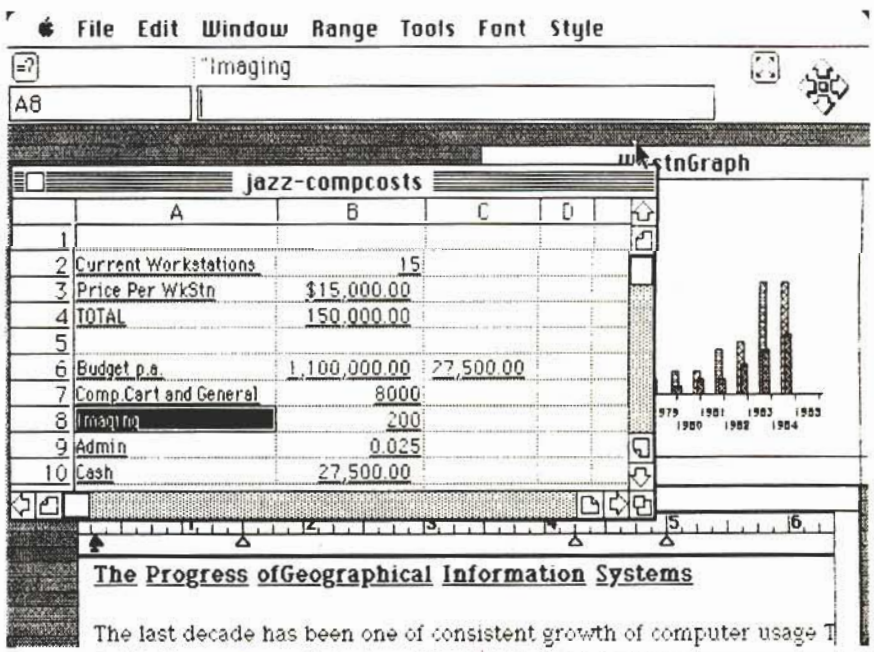
The main benefit of the data base over the spreadsheet is that the data base has a report writing facility and the ability to extract records satisfying certain criteria. Records can be extracted on one or all fields, with each field having one or a variety of criteria to match. Reports can be generated using a set of report generating commands. It all works very easily, except that defining formulae for calculated fields could benefit from a chance to be prompted on current field names. Transfer between spreadsheet and data-base environments is handled very smoothly using cut and paste conventions. It is also handled intelligently when the reception area for data doesn't quite match with the origin data.



Screen 1: A typical full-screen window of a document with pasted-in graph and the WINDOW menu down for selection of another document.

Communicating with Jazz

Communications is the last item. I have not had a chance to test this option beyond the point of transfer but it clearly allows both flexible terminal emulation and down and up-loading of documents to and from remote sites via modem. The unit can be used with any Mac file and includes the establishment of passing rules so that, for instance, text files can be fed into the database directly. Given the various options that the user can set or control the data communications aspect of this unit is very powerful.



Screen 2: Working on a small window with several other components of documents simultaneously visible.

Preliminary Judgements

It may be germane to end by commenting on less formal means of communication. We have seen that numerous options exist for transferring data between Jazz applications. Apart from pasting material into a word processed document text material can be moved into the data base or spreadsheet by automatic parsing. In addition, any information from any document can be pasted into the scrapbook. This allows transfer to other programs, especially of small diagrams or documents. Lotus have also provided programmed gateways in to Jazz from existing Lotus and Symphony files and for any files using the SYLK protocol favoured by Microsoft. This means easy conversion of exsiting Multiplan or Lotus files into full Jazz working format. All in all, this provides a rich interchange environment. The one sadness is that there are no equivalent utilities for moving the other way. Given the ubiquity of the scrapbook and the functions of the communications package however this is a hinderance rather than a severe handicap.

As I polish off this review I can switch quickly to the spreadsheet on timings and see that I have taken about six hours writing this and trying out various options as I went (I also got part of a working report written that needed more interaction between the applications than I could test with this review). I *did* resort to the manuals more than once. . . but almost always when I was trying out a feature that was completely new to me. Operations that I had tried out elsewhere in other environments came through intuitively from the menus and the mouse. Between them Lotus and Apple have created an easy to enter system of considerable flexibility and power.

Jazz retails for $1450. It gives you a well-integrated collection of rounded applications far removed from the days typified by 1-2-3's word-processing mode. It is easy to learn and use and yet very powerfu. Disk access time is minimal once the first application is in and it appears to perform its task with good speed. Like the mnice and icons themselves I suspect it is an addictive environment. . . and efficient.

The alternatives are purpose-built Macintosh software for each component task (at greater total cost and the loss of integration) or MS-DOS alternatives such as Symphony. How Jazz stacks up against these alternatives will be covered in a short, future extension of this review. Meanwhile, I had better finish that report I started.

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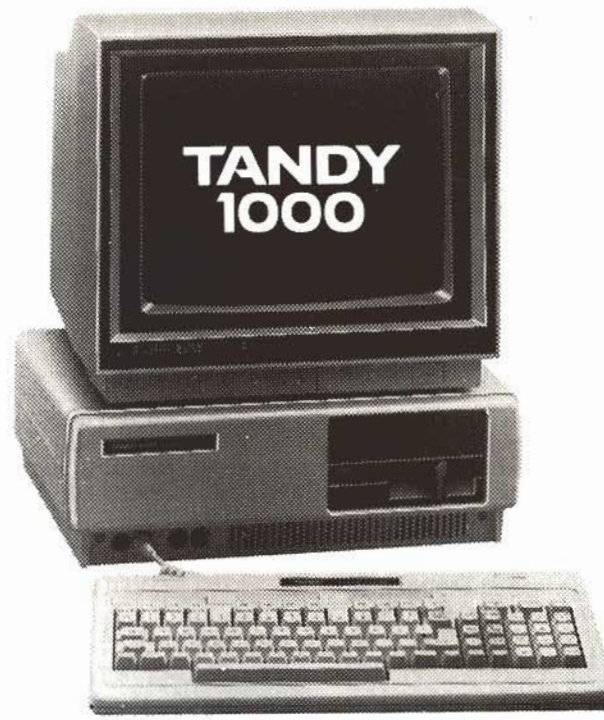

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THE JUKI 2200

A typewriter and a printer at a push

by John Slane

I can still remember the satisfaction and pleasure I got from my purchase many years ago of a small electric typewriter. The price then of $750 would probably equate today with an expenditure of over $2000.

Apart from the innovative and very expensive IBM golfball machines, electric typewriters in those days were merely manual machines with touch keys. About the only different feature was the facility to repeat a character by merely holding down a selected key — and even then, not every key on some machines was capable of this repeating function.

Today the operative word in the typewriter world is "electronic" rather than "electric". Because of the tight, and quite appropriate, copyright restrictions on the IBM golfball, designers from other companies had to do some lateral thinking to come up with another means of providing a high speed replaceable type head. And so the daisywheel was born.

Interestingly, the daisywheel was not copyrighted to be machine-specific, so it is available now on a wide range of machines from a wide range of manufacturers from all countries.

Coupled with a silicon processor unit, memory and a variety of bells and whistles including rudimentary display units, the typewriter has been transformed into an even more elegant and sophisticated tool for producing accurate and visually attractive text. And, as we have come to expect, the new features have come at little extra cost. Fairly "basic" electronic typewriters cost considerably less than their mechanical ancestors since electronic engineering is considerably cheaper in mass production than mechanical engineering.

With the explosion in the use of computers, and particularly for their word processing function, there is also a high demand for printers which enable hard copy of the electronic images. For some users there need is for "letter quality" print. Until dot matrix printers reach the next stage of sophistication (and it will come) this true letter quality is most inexpensively achieved by a daisy wheel printer interfaced to the computer. Generally these printers are dedicated devices — they have no keyboards.

However, many electronic typewriters may be provided with an interface (as an optional extra) that enables them to accept and print input from a computer. Such a configuration tends to be a compromise as far as the computer printer function is concerned — more expensive and slower than a dedicated printer.

This (finally!) brings me to the JUKI 2200. The developers of this machine have decided, quite appropriately I expect, that there is a niche in the marketplace for a device which is both a typewriter and a printer and which in its combined form is no more expensive than either a typewriter or a printer separately. The JUKI succeeds in this area both in price and utility, in a very basic configuration.

As a typewriter...

The typewriter is about 400mm by 350mm and weighs 6.8kg. With its stow-away handle it is in practical terms reasonably portable.

Forty four keys access the functions and up to 100 printing characters. Three pitches can be selected: 10, 12 and 15 characters to the inch. Maximum print speed is 10 characters per second — a rate I will never exceed! A buffer provides a type ahead facility, and for anyone unfamiliar with the new electronic typewriters this can be somewhat disconcerting — like talking into an echo chamber with your words coming back after you have said them!

Useful features include automatic centering of titles, automatic positioning of decimal points in columns of figures and convenient correction of typing errors.

Single sheet paper feed is reasonably accurate but the paper has to be guided under the paper bail top rollers as no guides are provided to steer the sheet all the way through the transport system. I found that the platten roller knob was set too close to the body of the machine and was inconvenient to use. Usually either the platten knob or a separate lever can be used to release the paper advance ratchet so that the paper can be aligned to pre-printed forms. I found no provision to do this on the JUKI unless one released the paper itself and slid it about.

The JUKI I used was installed with a Herald Pica 10 daisywheel. I found this only satisfactory. Some letter spacing and alignment was inferior. A range of typefaces are available for the machine and it would pay for the prospective purchaser to select the best character fonds rather than merely accepting the standard face installed.

As a general rule, the typewriter pitch should be set to the pitch of the daisywheel font installed. I notice on a lot of correspondence I see that typists are setting 12 pitch when using a 10 pitch font. This gives a tight look to the print but causes trouble with some combinations of letters that run together when typed at the wrong pitch.

The most disconcerting discovery I made when using the JUKI to print two long reports was the outrageous cost of typing with correctable carbon ribbon.

At the time of doing the review, the standard retail cost of this ribbon was just over $16. And how long did it last? Twenty A4 pages. And that works out for ribbon alone at around 80 cents per page!! By any calculation that is a very significant cost indeed. Other types of

(continued)

ribbon including fabric ribbon, are said to be available and a lower cost alternative should certainly be explored.

The final thing to be said at this point is that the JUKI 2200 makes no claim to be a word processor, and should not be considered as such. It is a straight typewriter.

. . . as a printer

As a typewriter, the JUKI is quite satisfactory in most respects. As a printer it is very marginal indeed.

The first and most major reservation is its very slow printing speed. At least the publicity is accurate — it does in fact print at 10cps, but in practice this means you have time to brew a pot of tea while you are waiting for one full page of text to print. The 2K buffer isn't sufficient to release the computer much before the page end so with a lot of printing to do you can get a good deal of tea drinking, knitting, or whatever done on the side.

Relatively few software control codes are available to manager the printer from within your word processing program, e.g. even the margins have to be set on the printer before going to the computer interface mode.

To its credit, it is very quick and straightforward to connect the computer to the JUKI (I used the parallel interface version) and to activate the printer mode (Control P). Shifting back and forwards between typing and printgging is also easy. However, if there is still information in the printer buffer that you want to clear, this can only be done by turning the printer off and on again. That also clears any formatting you may have set, so it's not without its problems.

Summary

For its price ($895) the JUKI 2200 is an attractive proposition for someone who mainly wants an electronic typewriter at the basic level.

As a printer it is slow and limited in capacity and flexibility compared to most of the dedicated printers available. It would be useful for the person who wanted to make occasional letter quality printouts, but would not be suitable as the only printer at the computer station in spite of its attractive price.

From a personal point of view, having a computer I find that I have no use now for a typewriter. All my writing is done on the word processor and what I need is an efficient letter quality printer (as well as a dot matrix printer for high speed drafts, program listings, labels, etc)

The JUKI is reasonable value as a typewriter. The printer facility could be regarded as a bonus — but I do not see it as a printer for serious and sustained use.

For those unfortunate people who don't have a standard parallel printer output on their computer, a serial output may be specified instead for the JUKI.

POSTSCRIPT

Serial interfaces to printers are widely if not exclusively used in the business world. A printer hire firm I contacted carries only serial printers and requires full details of your particular RS-232 so they can match your computer to their printer via one of scores of cable configurations they have to carry.

Can anyone tell me any advantage of serial over parallel interfaces for the ordinary dot matrix or daisywheel printer?

The distributor, Andas, which direct-mails the machine from Wellington, had available last month Juki fabric ribbons costing $13.50 each.

Andas general manager George Bright said the only problem encountered with the 2200 was the malfunction of the Olivetti-type Paxus fabric ribbon being used until the Juki ribbon became available.

The problem was the Olivetti cartridge mechanism being too tight for the Juki typewriter, and the 2200 was deceived to "reset" as with an end-of-tape signal.

Bright says the Juki versions of a suitable fabric ribbon are economical and have long life — the latter quality essential to the 2200 being economical to operate in printer mode.

Other ribbon prices are: correctible carbon $13, lift-off correction ribbon $4.50, cover-up tape $6.

Education Dpt. gets it right

With little fuss the Department of Education issued its new guidelines on the purchase of computer equipment by schools. After my comments on the previous report (when at last it reached the light) it is nice to be able to be more positive this time round. Out goes the concept of a list of 'supported machines' and in comes 'the forward-backwards' principle: choose what you want to do and work backwards from there.

Apart from an excessive optimism on the possibilities of inter-brand portability the report is as good as its predecessor was bad. Its authors deserve congratulations and the document deserves a far wide circulation than a few select decision-makers in schools. Parents, and even small businessmen, would be well served using this as an initial guideline to their own purchases.

Letters to the Editor

HP Integral PC Review

I have just finished reading the August 1985 issue of "Bits & Bytes" and, as usual, am very impressed by its presentation and content.

However, I noticed an error in the review by Peter Brown. The photo accompanying this review shows only the keyboard of the HP Integral PC. This could mislead the casual reader into thinking this machine had its CPU in the keyboard and was in the same league as some of the less powerful machines that are designed this way. Of course the keyboard is only an input device for the HP Integral PC: and the photograph therefore seriously misrepresents the machine reviewed.

Paul Merrilees

NZ QL USER CLUB

I have read the June issue of Bits and Bytes, and in particular the story on page 65 dealing with the New Zealand Spectrum and QL Users club.

It inspired me to write to you, as we poor unmentioned souls deserve a bit of a plug too! collectively we're the New Zealand QL Users Club. I edit a microcassette magazine and its available to any QL user who cares to send in a microdrive and SAE.

Ideally everyone contributes in some way, even if it's the effort of typing in Public Domain software from a magazine, and anyone who hasn't anything to contribute but is keen, I can send a program listing to type out!

I have written to various QL Clubs in England (and also Italy, Ireland, and the Netherlands!) and am hopeful they will support us, by means of information flow and public domain software. . . What is really exciting is the Global communication that computers are going to create.

Peter Avery
NEW ZEALAND QL USERS CLUB
Phone 689-201
20 Stokes Rd.,
Epsom, Auckland.

System 80s

You ask for comments and suggestions re the magazine. Gordon Findlay said it all in a recent article — "there's still a lot of upgraded System 80's out there."

Jim Blakeley
Palmerston North

Going it alone and looking good

by Shayne Doyle

Sharp's recent entry into the 16 bit business computer market is a handsomely styled, well built, 8086 based machine, with impressive graphics capabilities. As with most Japanese products, styling is impeccable — the unit has a fairly low vertical profile but has quite a large desk footprint and is very heavy at 12kg.

On the front panel in a lower recessed section is the power LED, audio output socket, recessed reset switch, audio volume slider (a most welcome facility), and a socket for the keyboard connector. A speaker grille occupies the top left quarter of the main section, and on the model I had, 2 grey TEAC disk drives take up the remainder of the front — drive B on the left drive, A on the right. The power switch is on the rear of the left side, a large ventilation grille in front of that — and a fairly noisy fan behind the slots.

Standard I/O sockets occupy the lower third of the rear panel: a second keyboard connector, DB25 connector for additional disk drive, DB25 parallel printer port, 2 RS232 ports (both DB15 rather than the usual DB25 connectors). A 5 pin DIN monochrome video output and 8 pin RGB colour video connector complete these facilities.

The large blank area on the rear is to accommodate a 4 slot expansion chassis — this is fitted and slots 1 and 3 are taken up by the hard disk interface on the MZ-5645 hard disk version. The 2 RS232 sockets are not identical, the A port having a full set of signals, but the B port omits carrier detect, call indicator, and send/receive timing signals. These can be used with some communications equipment but are not necessary for most RS232 connections. The provision of 2 keyboard connectors is unusual and the owner can use whichever is most convenient in a given layout. It is also possible to use 2 keyboards at once — this feature may well be just what someone out there is looking for.

Removing the case reveals a well laid out, tightly packed interior. A 4-inch wide section on the left contains power supply, cooling fan, and speaker. The motherboard occupies the rest of the cabinet base, with a second board mounted above it in the front section. Above that board are the disk drives — very robustly built TEAC units having a substantial cast chassis and electronics protected and screened by a perforated metal cage on top of each unit. These drives are nominally 640 Kbytes each, having a 256 byte sector, 16 sector track, 80 track per side formatted structure. In actual fact, a newly formatted MS-DOS disk without system written to it, gives 730 Kbytes free space. These drives are painfully noisy — when seeking between tracks a loud clacking emanates from them — perhaps head positioning solenoids. I have been assured by Beechey & Underwood that a modification to quiten this down will be available and fitted in future.

Keyboard layout

The keyboard is excellent, both in layout and feel. I am used to function keys in two vertical rows on the left, and it took a little while to get used to having these in a single horizontal row at the top. To the right of the function keys are six more special function keys: HELP calls up online help routines providing the software is set up to read the key, and COPY does a screen dump to printer. The remaining four keys are unlabelled and the owner's manual merely says "refer to manual for the software in use." The RETURN key does not have auto repeat, and I found this a nuisance at times. The BREAK key is definitely out of the ordinary, and drove me nuts trying to get it to do what your normal break key does — stop a program executing! This one merely pauses the program and touching any key starts it running again; I could find no combination of keys that would successfully stop a program, even the usual MS-DOS control sequences did not work.

The monochrome monitor supplied gave white characters on a black background, and this can be reversed by software control. The character set is pleasing to the eye, and although I could not find any reference to the actual number or pixels in the character matrix, it is fairly dense. I did not have a colour monitor unfortunately, and the CP/M-86 Basic demo lost a lot of impact in monochrome. However, for a business machine, this one sure has high quality graphics.

The display operates on the screen/window principle whereby a "screen" is an area in video RAM whose bits correspond one for one to the pixels on the physical video monitor display. Therefore, for a 640 x 400 resolution display, the 96k of video RAM allows 3 "screens".

Any data displayed on the monitor must go via a "window", which may be any size rectangular shape as long as it does not exceed the CRT screen size limits. The user can define up to four windows and display them in any position on the screen. They can also be assigned a priority to determine which windows are displayed when windows overlap.

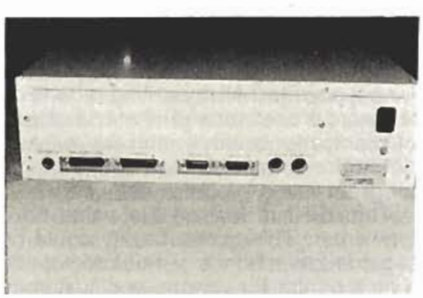
Colour is handled with eight palettes, each of which can be set with up to eight colour codes; and colour priority functions that also control overlapping priorities, although in a different way to window priorities.

The combination of these features permits very smooth detailed animation displays, and the supplied demonstration ably shows this, albeit in B&W on this unit.

Software

Two versions of BASIC are available for the machine, Sharp's own BASIC under CP/M-86 and Microsoft GW-BASIC under MS-DOS.

The Sharp BASIC is a highly individual implementation featuring many



unique commands to control the graphics, windowing, and communications facilities. The latter are very good, offering special commands for setting up RS232 parameters, sending/receiving data and polling the RS232 memory buffers.

GW-Basic programs do not appear to be completely transportable from IBM PC GW-Basic, and some conversions will be required to get a copied source going.

One I ran up against was the LOCATE command — it does not like this, and lacking a global replace command, I soon gave upon the large program I was converting. Graphics commands are quite different also, and conversions will require some degree of pre-planning.

The MZ-5600 is not IBM PC compatible, and Sharp make no secret of this. However, a full range of business software is available for MS-DOS and CP/M-86, including some of the well known packages. Such names as Sybiz, Micropro, DBase II, Calcstar, Wordstar, Supercalc, Multiplan, Knowledgeman, Sueprwriter, Peachtext, Friday, and Condor will be familiar, and a range of other vertical market products can also be supplied.

I hear Open Access is being converted, although not yet available locally. Software from the Sharp MZ-3500 machines can be patched to run on the 5600, and data files converted through the disk conversion utility.

Manuals supplied to me were an MS-DOS Users guide, providing adequate tutorial and reference material; CP/M-86 documentation binder containing five smaller manuals — MZ-5600 Owners manual, reprints of Digital Research's CP/M-86 Users guide, System guide, and Programmers guide. Also included is a supplement to the CP/M-86 Users guide dealing with those utilities written specifically for the MZ-5600. These include DSKMAINT which handles disk copying and formatting, RSPARM to comprehensively define RS232 parameters, IOCNF I/O configurator, PATCH which is fairly similar to MS-DOS's DEBUG, DSKCNV CP/M disk format converter handling Sharp MZ-3500/MZ-5500 and IBM PC formats, and FCOPY which permits copying disks using a single drive.

The MZ-5600 Owners manual contains some surprisingly detailed reference data on the machine including memory map, I/O address map, I/O bit map, full I/O connector pin-outs and signal data — the sort of information one has to scheme to get free for some other machines.

In conclusion, this computer has a lot of potentially good features, but it is a pity the majority of off-the-shelf MS-DOS software is barred from it. The couple of annoying problems mentioned earlier would need consideration, but perhaps the excellent graphics and high disk capacity would offset these.

MICROCOMPUTER SUMMARY

Name:	Sharp MZ-5600
Manufacturer:	Sharp Corporation
Microprocessor:	Intel 8086-2
Clock speed:	8 Mhz, switchable down to 5 Mhz
RAM:	256k bytes, expandable to 512k 96k video RAM, expandable to 192k
ROM:	16k Initial program loader
Input/Output:	Centronics parallel port, Two RS232 Serial ports; RGB Video output; Composite video output
Keyboard:	Detachable, standard layout, 10 function keys, numeric/cursor keypad. Mouse input socket.
Display:	25 x 80, 20 x 80, 25 x 40, 20 x 40 (lines x characters)
Graphics:	640 x 400 pixels maximum
Sound:	AY-3-8912 Programmable Sound Generator
Disk:	Dual 640k byte floppies, 80 track, 16 sector.
Operating System:	MS-DOS and/or CP/M-86 (both optional)
Languages:	Sharp Basic or optional GW-BASIC
Cost:	$6488 (Dual diskette drives) $9993 (Hard disk, single diskette drive) (Both prices with monochrome monitor)
Options:	Single floppy/10 Mbyte hard disk version; 8087 Math co-processor (socket on-board); 256k RAM expansion $920; Mouse $280; Colour monitor $1740; External 10Mb hard disk $3550; CP/M-86 operating system $220; MS-DOS operating system $175
Ratings: (5 highest)	Documentation 4, Language 4, Expansion 5, Value for money 4,

Review unit courtesy of Beechey and Underwood Limited, Wellington

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The Quark Qualifies

by Fred and Alex Wong

With Apple's decision to streamline the Macintosh product line and the subsequent withdrawal of the Macintosh XL (the ex-Lisa 2/10), hard disk storage for the 128 and 512K Macintosh is even more desirable. The Quark Peripheral's elegant 10 megabyte hard disk, the QC10, imported and distributed by CED (the sole New Zealand agents for Apple Computer), connects to the Mac to provide this storage and also plugs into the Apple // and III line of computers.

Hardware and Installation

Very carefully packaged inside a large box is the handsome Quark drive that can sit under the Macintosh and actually lifts the Mac screen to a more convenient height (and saves Fred from slouching). It also (incidentally!) has the same footprint as Apple's DuoDisk and sits very nicely between a //e and its monitor. As well as the red disk access light on the front panel is an entertaining 'quack' (Quark?) sound when the drive is reading or writing. There are two 19-pin, D type connectors on the back, one to connect the Quark to the computer and one to chain the external disk drive to the Quark. There are also two rocker switches as well as the power cable and on/off switch.

To install the Quark to the Macintosh, there is only one cable connecting it to the Mac's parallel, external disk drive port. At this time, the Quark does not support the Mac's external disk drive but, with the installation of a hard disk, isn't much of a hindrance. To install it in a //e (which must have a 128K RAM), the Quark's cable is attached to the Disk II or DuoDisk controller card and the disk drive is attached to the other Quark connector. For a //c, the cable is connected to the external drive port and if there is an external drive, its plugged into the Quark's other connector. Then, to configure the Quark for the //, III or the Macintosh the two rocker switches are positioned individually.

Macintosh Operation

Firstly, Fred tries the Quark on a 512K Macintosh. The startup disk contains Quark's special version of the system folder and finder that drives the hard disk. When he boots it, he is presented with a disk icon, which he double clicks to activate the Volume Manager.

In many respects, the Quark volume manager is very similar to the Tecmar hard disk's volume manager, which we looked at earlier. It presents all volumes currently defined on the Quark, along with their type (Macintosh, ProDOS/SOS, Pascal), size, when created and whether they are mounted. It can create up to 63 volumes (that is, set aside a certain amount of space on the hard disk that is accessed like a separate disk), and it can mount (place a volume on the Macintosh desktop, much akin to inserting a disk) up to four volumes at once or unmount them.

The Quark's volume manager embodies some improvements. As a volume is mounted, it will ask if it should only be allowed to read the data (similar to write protection on a floppy disk) or both read and write. It allows volumes to be auto-mounted, so that the specified volumes (up to four) will be mounted each time the startup disk is booted. This is a great feature as it allows faster, easier access to frequently used applications. Then, especially for an office environment where many people may have access to the Macintosh, there is a three tiered password system under which each sector (public, group and private) is allowed only as much access as the volume has specified. Access may be

(continued)

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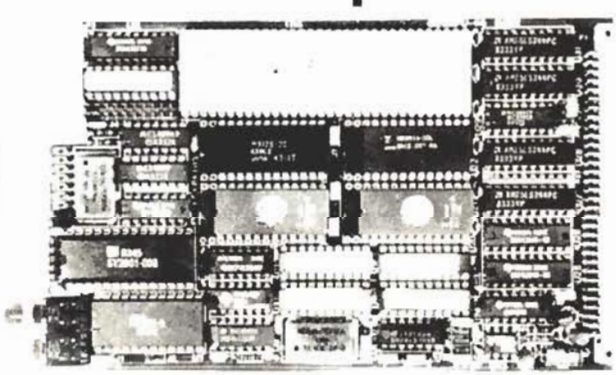

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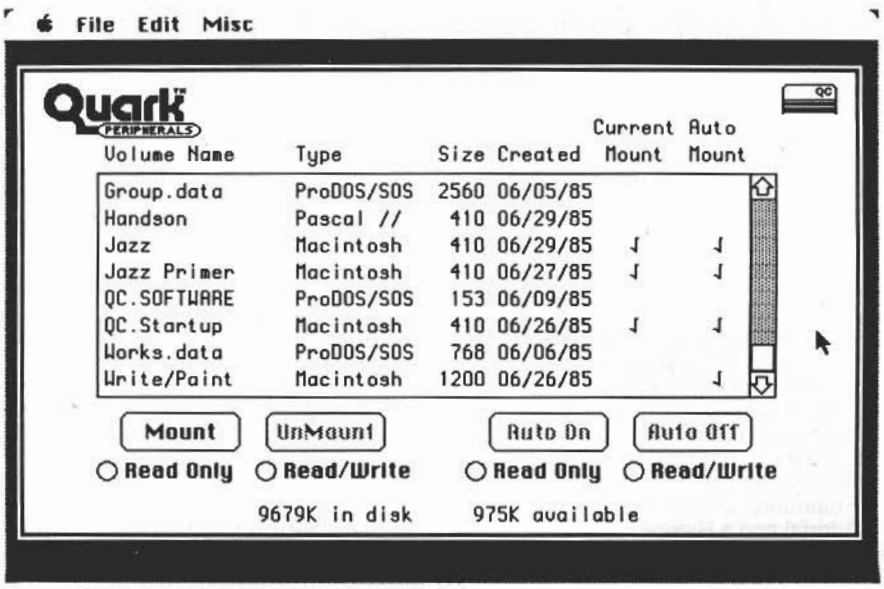
restricted to none at all; read only; read and write; and read, write and delete. If a password is forgotten, all is not lost, there is always a one-way ticket to Tibet... and there is also a master password which enables access to all volumes.

Since the startup disk doesn't eject itself after it activates the hard disk, Fred ejects it manually (as manually as a Mac ever gets, that is) and then he tries to throw away its icon. He finds that he can only do this after an application is run off the hard disk so that the Mac thinks that the Quark is the startup disk.

File maintenance is as easy as ever — drag those icons around and watch 'em go! The Quark eliminates all that disk swapping that single drive Mac users get used to and supplies entertainment (by virtue of the quacks and clicks) as well.

The newer version of MacPaint (so Fred is very quick to point out) doesn't access to disk to draw the screen so in order to get an idea of the speed of the Quark we boot MacWrite and find that it boots about twice as fast as the Mac's internal drive and it saves a page at about three times the speed. The fan (which could be quieter), goes all the time to ensure reliable operation with the Macintosh.



//e, //c Operation

The Quark connected to a //e or a //c is a real novelty. Where Fred was used to the Macintosh's quick'n'easy style and hi-res icons to manipulate files, he's now faced with a normal Apple II-type screen display of a program that basically does the same things as the Mac's Volume Manager. A volume manager is necessary because despite ProDOS' skill in handling high capacity disks, it doesn't allow disk space to be segmented, which is vital, given the Quark's ability to support many data formats on the same unit.

When Fred uses version 1.1 of the Volume Manager, he encounters some interesting features. Volume names acquire parts of other names or pick up totally incomprehensible characters. Information is overwritten onto different volumes and cannot be retrieved, and entire volumes become inaccessible. Hahhh... I think... this can't be right — and it isn't. This version wasn't designed with Euro-boards in mind and consequently doesn't work with New Zealand Apple II's. Fred picks up the other disk, marked version 1.2 and reboots.

Version 1.2 of the Volume Manager (which CED had a decisive part in), is admirable. During boot, it installs the hard disk drivers and if any have been specified, auto-mounts volumes. Up to four volumes, which may be any size, may be mounted at once and are each referred to by a slot and drive number. A single volume, containing all space on the disk may be specified or each application and data file can have its own volume, the number of which is limited to sixty-four. This arrangement can actually provide for very flexible disk space usage, and the arrangement can be changed at any time to suit individual taste.

The Volume Manager is very easy to use and almost all the characteristics of a volume may be changed quickly and easily. Once the auto-mount feature is installed on the most frequently used volumes, though, it only needs to be accessed occasionally. The password system available on the Macintosh works similarly here. The Quark speeds up the working time of a partially disk-based program like AppleWorks immensely and makes disk-write waiting times a thing of the past.

Documentation

The Quark comes with an attractive manual that contains instructions for the Macintosh, III and II series. It sets out step-by-step instructions for installation and configuration for each of the computers, details the volume managers and software drivers, includes power up tests and tells how to use and care for the Quark hard disk.

Unfortunately though, I see that it is not divided into one section for each computer but has instructions for all four, mixed together throughout the manual. This intermingling, while notably progressive to model-equality, is not at all conducive to the discovery of often-times, direly-needed, disaster-averting data or diagram in this information-packed document!

Summary

The Quark's operation with both the Macintosh and the // series is commendable and easy, and Fred will probably feel Quark-sick for some time to come. Anyone currently with one but thinking of switching to the other, or any office with both machines will be able to appreciate its versatility in performing easily with either system. At a price of $6,569, including the service and technical backup of CED, who already service all Apple Computer equipment, the Quark qualifies as a first rate peripheral.

System Summary

Name:	Quark QC 10.
Manufacturer:	Quark Peripherals, Inc., Denver.
Type:	10Mb Winchester hard disk.
Features:	Standard unit compatible with //e (128K), //c, /// and Macintosh.
Reviewers' ratings:	Documentation: 3; ease of use: 5; value for money: 4; support: 5.

(Review unit supplied by CED Distributors Ltd., Auckland.)

Le Calc Du Mouse

by Fred and Alex Wong

For people and businesses that do a lot of spreadsheet or graph work, have a //c or 128K //e and a Mouse// on the desk, here is MouseCalc, a novel piece of software that is designed exclusively to be used on the Apple II with a Mouse to give it Macintosh-like capabilities. Written and manufactured by Version Soft of France, and distributed locally by Brinmaur Computer Services, it features double hi-res graphics, mouse-cursor control and pull down menus.

MouseCalc comes in a neat box that contains a hardcover, ringbinder type manual (the same size as the later Apple // manuals) and which is divided into a Tutorial and a Reference section. There are three disks — one contains sample MouseCalc files, one is the program disk and, since MouseCalc is protected, the last one is a backup of the program. Included also is a jumper for the //e's Extended 80 column card (and instructions on how to install it) to enable it to use double hi-res graphics.

Operation

Soon after I boot up MouseCalc, I make room for Fred, who promptly sits down and ties up my Apple for some unaccountable amount of time. To write this article (and untie my computer), I ensure that the mouse and interface card is plugged into Fred's Apple...

As well as the usual spreadsheet display, MouseCalc presents a very Multiplan-on-Macintosh-like interface. The columns and rows of the spreadsheet are divided by a grid. Across the bottom and down the right hand side are 'elevator' bars with arrows on the ends and a marker (the elevator) to represent where the screen is in relation to the entire spreadsheet. By clicking on the appropriate arrow, the spreadsheet can be moved one space at a time. By dragging the elevator in the desired direction, the screen can be moved quickly within the spreadsheet, which is just as well, to counter its rather slow single column or row scroll speed. A window may be opened (the screen split) easily, by dragging a window marker along an elevator bar, horizontal or vertical to the desired location.

Along the top of the screen are nine pull-down menu items. At any time, the functions contained in these menus may be accessed by placing the mouse-driven cursor on the desired item and clicking the button, at which time the functions appear, as if 'pulled down'.

The first menu, called File, deals with file maintenance. These functions are used to open, save and delete files, as well as to select the data disk location, format a data disk or to read a standard ASCII text file.

The second menu, called Edit, changes information on the spreadsheet, usually in areas highlighted on the screen with the mouse. These functions are used to copy and move labels, values and formulae to other parts of the spreadsheet, with or without adjusting the formulae relatively. They can blank cells or blocks of cells, insert rows and columns, edit particular cells and undo the previous command. They also set or clear the grid and can change the widths of columns individually or globally.

The third menu allows printer configuration and selective or complete printing of the spreadsheet or the graph to the printer.

The Function menu is very impressive. Instead of prolonged keyboard manipulation to set up a spreadsheet with the required formulae, these functions allow formulae to be entered entirely via the mouse, needing only the appropriate clicks and highlighting of the proper cell or blocks of cells. These functions include the standard mathematical terms as well as averaging and counting lists and sorting out the maximum and minimum entries and more. There are some lesser used functions that may only be accessed from the keyboard. These include absolute and integer values, rounding off decimal points, logarithms, squares, square roots, and Pi. Logical expressions (true, false, and, not, or, if) are supported as well as, really obscure (for me) functions like choose and lookup.

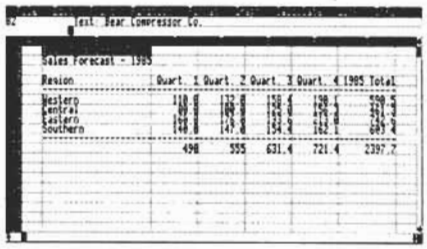
The Format menu is used to specify justification, decimal places, and dollars, as well as protection (from accidental erasing) of formulae in the cells.

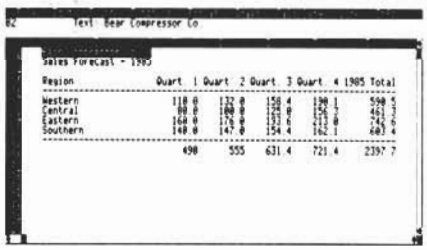
Graph significant

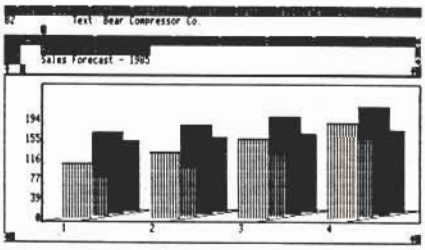
The Graph menu heralds a significant part of MouseCalc; its ability to chart spreadsheet results into a graph that is displayed in a window on the screen or output to the printer. Each set of bars (or lines, depending on which mode — line, bar, 3-d bar — for the graph is chosen) represents one particular range of figures from the spreadsheet. Up to eight ranges of comparitive information may be placed in each graph and each is dynamically linked so that if a figure is updated on the spreadsheet, then the graph will also be updated. This is a very useful function as it allows easy visual comparisons and conclusions to be made toward data that may otherwise be hard to relate.

The Calculate menu contains commands to set automatic or manual calculation by row or column, show all formulae at once and 'name a range', which is to specify a range of data for the graph.

The rather prosaically named Link menu enables the reading or writing of DIF files, which makes MouseCalc data files compatible with AppleWorks and Visicalc and vice versa. It also allows the addition or subtraction of the values of two spreadsheets which have the same structure and format.







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WORDPROCESSORS COMPARED

By John Macgibbon

Have you ever wondered how Apple word processors stack up against those used by the MS-DOS and CP/M-80 crowd?

The other day I was reading a Byte magazine review of NewWord, a new MS-DOS/CP/M-80 word processor. NewWord comes from some of the people who wrote the original Wordstar, and is apparently a considerable improvement over that cumbersome beast.

I was intrigued by benchmark comparisons, based on a 4000 word text file, that Byte applied to the program. How would an Apple II program, running on the much slower 8-bit 6502 processor, compare?

I checked it out with AppleWorks and Apple Writer II, both running under ProDOS on a 128K machine. Testing DOS 3.3 word processors was trickier. Few if any DOS 3.3 programs can handle files as big as 4000 words, as they are generally designed for 48K or 64K Apples. Of those that I own, the Australian program "Sandy IIe" managed the most: 3600 words. So I used that and adjusted the timings upwards on a pro rata basis. Probably not entirely accurate, but surely not far wrong.

The test compared times for loading, saving, searching for the last word in the article, and manually scrolling from top to bottom. Byte did the tests on the IBM PC, PC jr, Compaq and Morrow MD-11, and presumably averaged the results. All those machines should theoretically be much faster than the Apple.

	Doc. load	Doc. save	Search	Scroll
AppleWorks	21.8	31.8	2.8	33.7
Apple Writer II (ProDOS)	18.1	32.4	7.0	32.2
Sandy IIe	7.2	20.3	2.2	33.8
NewWord	19.8	23.2	10.8	1.21.5
Wordstar	9.9	24.9	10.5	41.2
Volkswriter Deluxe	22.0	21.9	7.0	30.1

The results, timed in seconds are shown in Fig 1.

All three Apple wordprocessors did remarkably well in comparison with their big brothers. One of them, Sandy IIe, beat allcomers by a wide margin. It may be no coincidence that its writer, Sandy Donald, was inventor of FastDOS, the first speeded up DOS for the Apple II.

Considering it is not a stand-along word processor, AppleWorks did remarkably well overall, and ran rings around the 16 bit machine wordprocessors in the search test. (Actually it walks over the others in the scroll test too, if you do the sensible thing

(Continued 28)

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AARE01	Dropzone	T	53-60
AARE02	Dropzone	D	69-15
ACC011	Beachhead	T	49-50
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ALLA021	Mutant Camels	T	35-60
AMICROBYT1	Er*bert	T	33-85
AMIP011	Spitfire Ace	T	53-60
AMIP021	Spitfire Ace	D	69-15
AMIP071	Nato Commander	T	53-60
AMIP081	Nato Commander	D	69-15
AMIP091	Solo Flight	D	79-60
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BDAT011	Micro Olympics	T	30-50
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User Group Power

By Shane Doyle

The computer users groups are an informed community forming a powerful educative force within the wider community even though they do not all state their aims expressly "educational." This is one of the findings of a survey carried out recently by R. B. Bibby under the terms of a J.R. McKenzie scholarship administered by the NZCER, as part of a study of Adult Education in Computing.

A questionnaire was circulated to 104 user groups listed in the October 1984 issue of Bits & Bytes magazine, and replies were received from 77 of these. The questionnaire had been drawn up after very helpful discussions with Wellington and Auckland user groups, and by studying many newsletters, constitutions, etc.

The questionnaire took the form of questions about aims, ethics, liaison with the public and other groups, and a request for comments; as always it was the comments which were most interesting.

Taken as a whole, the user groups rated their prime aim as "providing expert advice from within and without the group, for the benefit of members." They are therefore clearly "educative" in the wider sense, for members of the group. They also provide an opportunity for members to meet people of similar interests and to pool resources. "Educative" aims such as inviting the public to meetings and running exhibitions and displays were not highly rated, but the fact that some such contact with the general public is nevertheless occurring — in the case of the Auckland exhibition, for instance, very successfully.

Six user groups were basically concerned with computer education — these are "computers in education" societies, now linked into a national body, the NZCES, which plans its first conference in August. Many of the members are teachers, and a prime concern is the effective use of computers in schools. Two other groups were also interested in computers in education — one was formed for the benefit of gifted children and the other runs a software exchange between schools with the same make of computer.

One group, the umbrella organisation linking some 15 user groups in Auckland, does see the formulating of ethics and the education of the general public as part of its role. Two other groups were primarily business-orientated. A further two groups were mainly hardware orientated, and one of these states that "the aim of building your own computer is not to save money; it may even be more expensive than buying one, but it is more educational to do so."

Of the remaining groups, 42 were machine specific (21 different makes of computer); these have a different character from the other 21 remaining groups who were not machine specific. The latter tend to have as their aims "fostering interest in computing" while the former can go into far more detail as regards the hardware and software of a given machine. There is considerable liaison between groups using the same make of computer, both here and overseas.

Analysis of the comments provided on the questionnaires reveals some of the concerns not only affecting user groups but also home computer users in general: "Our group suffers from lack of local technical knowledge. The costs of books, programs etc tends to limit our content." More than one group commented on the problems associated with providing assistance to "disillusioned people who saw computer adverts with computers doing all sorts of things. They buy one and find it takes a lot of programming skill and learning to make it do all these things, or a lot of money buying programs," and people who "are annoyed to find that programming takes more than half an hour to clear." A lot of these people turn initially to the user groups to provide this tutorial service, but it is my own personal opinion that they would be better served by attending the various level night courses offered by most high schools these days, and then joining a user group for continued advancing education.

Several groups stated they were planning to run a bulletin board service, quite a few are in existence now, and the opportunities offered for exchange of information and ideas generated by these boards means that they will proliferate over the next year or so.

It seems that NZ, too, is pervaded by much of the spirit described by Stephen Levy in his book "Hackers: Heroes of the Computer Revolution," a history of the last 25 years of computing in the USA. It seems that we, too, have found that it is by co-operating, sharing ideas, helping each other, that we are achieving great things with our microcomputers.

The actual numbers of members involved in NZ Users Groups is not completely known — some groups gave membership estimates on their questionnaires, and these average about 50 members per group, with some groups as high as 300 or 400 members and a couple "about to close down" (one of the latter because members had left it for machine specific groups). Dr Bibby would be most interested if you could send her membership figures for your group, to this address: 49 Walnut Way, Maungaraki, Lower Hutt.

FIRST PRIZE

"I've never won anything before." That was the reaction of assistant marketing manager of NZ Post Office Telecoms division, Ron Cox when he learned he had won an Apple IIe at the Wellington Computer Show.

The computer was offered in a contest to all who attended and entrants had to say what they would use the computer for. Mr Cox, who has access to an IBM PC at work said he would be using the Apple, which was sponsored by Andas Computer Services for customer and sales records and analysis — "and at home." Mr Cox is pictured on the left with Hugh Johnston, general manager, Andas Computer Services.

Apple *(continued)*

and speed up the down arrow by simultaneous use of the open Apple key. That way, I zapped manually from top to bottom in 5.1 seconds.)

Apple Writer II scored very close to AppleWorks, except that it was a little faster at loading files, and noticeably slower in the search test.

Incidentally, when reading through the NewWord review I was struck by the number of "improvements" over Wordstar that I already take for granted in my Apple II wordprocessors.

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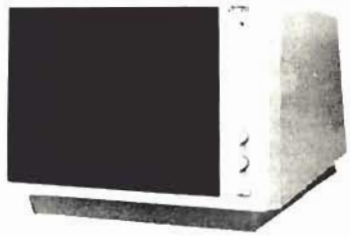

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DOSPLUS for programmers and hobbyists alike

by Gordon Findlay

The last major DOS I want to write about, for a good while anyway, is DOSPLUS. Like LDOS, described last month, DOSPLUS is a more recent style of DOS than TRSDOS and its derivatives, and indeed in overall style and operation DOSPLUS is very like LDOS, and I must fight the temptation to compare the two all the time.

DOSPLUS has been through various incarnations, the latest version being 3.5. Earlier versions (3.3, 3.4 and 4.0!) differ significantly in the methods of configuring the system, and in support for hard disks. Although few readers of this column will be using hard disks, DOSPLUS supports them fully.

DOSPLUS is a product of Micro-Systems Software, of Boca Raton, Florida, home of the small systems division of another manufacturer. It was written by Steve Pagliarulo and Todd Tolhurst, in model I and model III versions; I think a model IV version is also now available. The system is virtually identical for both models, apart from a very few entry points used by machine code programmers.

Because of the volume of documentation and number of features included in the system, I will just point out some of the more interesting or unusual features here. Anything that is valid in TRSDOS will also work in DOSPLUS.

DOSPLUS uses an external driver structure, so that the pieces of code which communicate with the peripherals such as screen, keyboard and printer are separate programs, called drivers, which are loaded as required. The system will use the standard ROM routines, unless alternative drivers are chosen and loaded. This is very flexible. Initially when DOSPLUS is loaded the keyboard has no autorepeat, the screen no lower case. These are among the facilities provided by the drivers. The drivers supplied, installed using the ASSIGN command, provide all these and more. As an example, the printer driver, once installed, provides

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automatic pagination, support for serial as well as parallel printers, spooled output and so on. The use of drivers allows you to configure the system just as you desire, and to include only the parts you need. For example, I prefer the keyboard to function like a typewriter, shifting for upper case rather than for lower. This means just a suitable configuration of the KI (keyboard input) driver.

Associated with the drivers may be filters, which act as a sort of translation between the peripheral and the system, say for a Dvorak keyboard, or for printer control codes.

System save

Once customised with the drivers and filters desired, the system may be saved in a configuration file. Different configuration files may be saved if desired, for use with different printers perhaps, or for different users' preferences and needs.

DOSPLUS has all the usual commands, most of which are extended in one or more ways beyond the TRSDOS standard. Files and devices such as keyboard and printer may be used almost interchangably, which allows for all sorts of elegant and useful tricks. Just as two files can be appended, tacking one onto the end of another, the keyboard may be appended to a file, so that whatever is typed is written directly to disk.

Disk drives are one of the more variable portions of the TRS80 system, with a multitude of different types. DOSPLUS allows the configuration of each drive separately, setting the density, the number of sides, the number of tracks and so on. These can be altered "on the fly", or temporarily, in order to read and write "foreign" disks. Copying between disks has a number of useful options, including the use of a wildcard to specify a range of files. Again, because a device and a file may be treated (almost) identically, a disk file may be copied to a device such as a serial output; or a serial input copied to a disk file.

DOSPLUS uses the DIRectory command to display such file information as the length, protection status and date updated; the shorter form with just the file names is obtained by CAT(alog).

Unlike some operating systems it is not necessary to reboot to change from one disk format to another. DOSPLUS has an "I" (for initialise) command, which "logs on" the disk now in the drive and updates the drive characteristic table. This of course avoids losing information through rebooting.

ASC II files

A BUILD command is available for creating ASCII files. These may be used as filter tables — the simplest method of filter specification I have seen — or as CHAIN files for automated execution of a sequence of commands. Similar, but extended far beyond, this is a sophisticated job control language, which is really a separate programming language for handling devices and files, with user input. Utilities include A BACKUP, CONVERT (to alter TRSDOS disks to DOSPLUS format), DIRCHECK, to check and perhaps repair damaged directories, DISKDUMP, to display and modify disk data directly, and DISKZAP, a disk editor. DISKDUMP operates at the file level, DISKZAP at the sector level. Other utilities include FORMAT, HELP, MAP, which displays the areas allocated to a file on the disk, PATCH, RESTORE which reverses the effects of an unwanted "KILL", reclaiming the accidently deleted file, TAPE to transfer system tapes to disk, TRAP to intercept disk errors and allow the operator to determine what action to take, and SYSGEN to put the system modules on disk media.

A big system such as DOSPLUS has many more options than the normal user

(continued)

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will remember. The most common commands will become second nature, but without frequent reference to the manual some of the less commonly used options will soon be forgotten. The manual is enormous, and for the most part well written and well organised. A reference card would be useful, so would an index. The detailed technical information isn't separated from the elementary information as much as it could be, and there are plenty of examples but not enough simple ones. None of the DOS manuals I've seen have enough simple examples. Configuration to my rather individualistic hardware was straightforward and quick.

The manual provides full technical information for the programmer, with access given to all major DOS routines. This section is very well laid out and clearly written. Information about addition of drivers and filters is included as well, and the task of writing a driver, initially rather daunting, is made much easier by the description and examples given and the integration of the drivers into the system — in fact the system does most of the work.

My impression, after six months intermittant use of DOSPLUS is that it is a well thought out, comprehensive system, well suited to hobbyists and programmers. There is far more in the system than the mere user requires, but on the other hand the user may be shielded from the system by a shell written in Job Control Language. It is ironical that the TRS80 machines have more sophisticated and powerful operating systems than machines boasting many times as much hardware power, and much inflated price tags.

Our thanks to Molymerx Ltd., P.O. Box 60152, Titirangi, Auckland, who are the New Zealand agents, for loan of a copy of DOSPLUS for review purposes.

Home market review

Data processing consultancy Arthur Hoby and Associates has released a review of the home computer market, for the year ending last December, which reports an estimated five percent of New Zealand homes currently having PCs.

The installed base of PCs in this market — described as the most frustrating and difficult of all information technology markets, in terms of suppliers' business efforts — is estimated at almost 120,000 units with purchase values totalling $126.6m.

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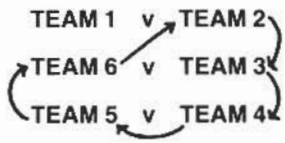
The trick is in the numbering

by Gordon Findlay

Let's write a program! As we do so, I'll provide some sort of commentary. This month's program is relatively simple, but the programming process is interesting, and the result is a useful piece of code. Hopefully too, you will learn something about the way to tackle a program which doesn't seem obvious at first, although it is relatively simple once you see the best data representation.

The problem is to print out a draw for sports competitions. The competition is divided into grades, typically A, B, C... although others, such as 'President's grade' might occur. Each grade will be divided into sections, and the draw must provide for every team in a section to meet all others in that section.

The way such a draw is organised must be understood. Suppose, as a concrete example, there are six teams. Round 1 of the competition might look like this:



Ignore the peculiar numbering just now. In the next round of the competition, TEAM 1 stays in the same place, and the other teams rotate as in the diagram. The result is this:

TEAM 1 v TEAM 6
TEAM 5 v TEAM 2
TEAM 4 v TEAM 3

The matches in each successive round are found in like manner, rotating all the teams except the first. As each team must play all others, the entire competition must have, in this case, 5 rounds; in general the number of rounds is one less than the number of teams.

Why the perverse numbering system? That's the trick! The obvious numbering system, which we might unthinkingly use, looks like this:

TEAM 1 v TEAM 2
TEAM 3 v TEAM 4 etc.

This isn't nearly as easy to handle in a program.

When tackling a project such as this I like to get the logic fixed up before I worry about the input and output. So I began with a simple program which just does the rotation from one round to the next.

Obviously the team names will be recorded in an array — called T$. To begin with let's just have eight teams — enough to make a good test of the logic, but few enough that a test doesn't take for ever to run and check. And why bother typing in test data at this stage? Let's build it into the program. We can begin then with:

```
10 DIM T$(8)
15 REM use dummy data to save time
20 FOR I = 1 TO 8 : READ T$(I) : NEXT
30 DATA A,B,C,D,E,F,G,H
40 NT = 8
```

Notice that although I know that there are eight teams, I have used a variable NT. This is to save having to change a whole bunch of 8's in the program later, and possibly miss one.

Now to handle the rotation. With the above numbering system, each team moves into the position occupied by the next — TEAM 4 moves into the position occupied by TEAM 5 and so on. The two exceptions are TEAM 1, which stays put, and the last team, which moves to position 2. The general case is handled like this, using a loop of course:

```
70 FOR I = NT TO 2 STEP -1
80 T$(I) = T$(I — 1)
90 NEXT
```

The replacements must be made in this reverse order — to see why, trying writing line 70 FOR I = 2 TO NT and watch what happens.

Before this rotation, in lines 70-90, we must save the last team name, and after the loop put this saved value in position 2. This means using a temporary string:

```
60 TEMP$ = T$(NT)
100 T$(2) = TEMP$
```

This rotation must be done NT —1 (i.e. 1 less than the number of teams) times, so lines 60 to 100 are to be imbedded in another FOR loop. Notice the way this was developed — handle the rotation once, then enclose the whole in a loop. The program lines were most definately not produced in order!

Now the print-out. I very often find that this is where many people come unstuck. Look at the extracts from the draw given above. Notice a pattern? Apart from the first row, the two teams in each line have the same total, nine, so as one team's number is known, the other's is found by subtracting from 9. Why 9 I hear you cry? Well, that's 3 more than the number of teams in the example! Don't try to understand why — do what I did, and write out another example on a scrap of paper. I chose 10 teams, and found that the total was 13.

The first line must be handled separately, but the rest are done neatly in loop:

```
120 FOR I = NT TO NT/2 + 2 STEP -1
130 PRINT T$(I), T$(NT + 3 -1)
140 NEXT
```

The loop expressions are a bit more complex, and again are most easy found from examples. These sort of expressions, and the idea of obtaining one subscript by subtracting the other from some constant, are the two most common of these rather pesky pieces of mathematics which creep in, and they are worth looking for first.

Now put the lot together, and we get the first version of the program:

```
5 REM first test — what's wrong?
10 DIM T$(8)
15 REM use dummy data to save time
20 FOR I=1 TO 8: READ T$(I): NEXT
30 DATA A,B,C,D,E,F,G,H
40 NT = 8
50 FOR RO = 1 TO NT -1
60 TEMP$ = T$(NT)
70 FOR I = NT TO 2 STEP -1
80 T$(I) = T$(I-1)
90 NEXT
100 T$(2) = TEMP$
110 PRINT T$(1), T$(2)
120 FOR I = NT TO NT/2 + 2 STEP -1
130 PRINT T$(I), T$(NT + 3 -I)
140 NEXT
150 NEXT RO
```

Lines 50 and 150 provide the loop for each round, and line 110 does the special case part of the print-out. Nothing printed on paper yet — this is just to check out the logic.

And the logic is, strangely, correct! However, what is printed in the example above as the first round is actually printed last, and as some users might want to control the draw in that first round, I decided to change the position of the output so it's done before the rotation rather than after. The output

(continued)

format can get tidied up at the same time. Rapid repair, and while we are at it let's turn the output portion into a subroutine now that we know it works. The result:

```
5 REM stage 2 — logic now OK.
10 DIM T$(8)
20 FOR I=1 TO 8: READ T$(I): NEXT
30 DATA A,B,C,D,E,F,G,H
40 NT = 8
50 FOR RO = 1 TO NT -1
53 PRINT:PRINT"Round"; RO
55 GOSUB 900
60 TEMP$ = T$(NT)
70 FOR I = NT TO 2 STEP -1
80 T$(I) = T$(I-1)
90 NEXT
100 T$(2) = TEMP$
150 NEXT RO
160 END
900 PRINT T$(1), T$(2)
905 FOR I = NT TO NT/2 + 2 STEP -1
910 PRINT T$(I), T$(NT + 3 -I)
920 NEXT
925 PRINT
930 RETURN
```

A sample of the output from this program:

```
Round 1
A       B
H       C
G       D
F       E

Round 2
A       H
G       B
F       C
E       D

Round 3
A       G
F       H
```

Try playing with this program. Specifically, try changing the number of teams. A problem arises when the number of teams is odd. In this case one team in each round must have a bye. The test for an odd number of teams can be carried out this way:

IF NT/2 <> INT (NT/2) THEN (there are an odd number of teams)

If the number of teams is odd the first division by two produces a number with a fractional part of 0.5, which is dropped by the INT function in the second division, so the two aren't equal. If NT is even, there is no fractional part in either case, so the two are equal.

If there are an odd number of teams the easiest thing to do is to add another team, called "**BYE**". This will rotate in the same way as the rest, so every other team will meet it once.

Now that the logic is right, we can work on the input. Most of the above can be made into a subroutine, and this subroutine called once for each section in each grade of the competition. The names of the grades can be input from the user and stored in an array of strings, so they can be anything at all.

To make input of a list of teams or grades as easy as possible, the program may be written so that the user need just type entries one after the other, pressing the RETURN (or whatever it's labelled) key each time. The user can indicate the end of the data by simply pressing the RETURN key on its own. A minor complication arises with some versions of the Microsoft Basic INPUT statement, in which just pressing the RETURN key leaves the variable being input unchanged. To get around this, we use this sequence:

```
X$ = "": LINEINPUT X$
```

If the RETURN key alone is pressed the value of X$ will be "", or the *null* string. (The LINEINPUT statement isn't available in all Basics, and differs from the usual INPUT only in that commas, colons and so on are accepted as part of the string being read rather than as separating items.)

There is no point in asking the user how many grades, teams or whatever she wishes to use — count them as she types. Here's how:

```
75 NGRADES = 0
80 PRINT "Next grade:";: GOSUB
```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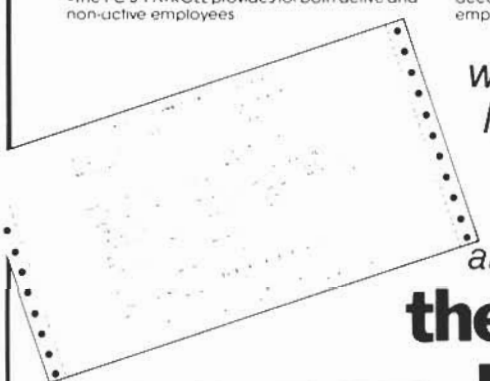

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```
10000
90 IF X$ = "" THEN GOTO 110
100 NGRADES = NGRADES + 1:
  GD$(NGRADES) = X$: GOTO 80
10000 X$="": LINEINPUT X$:
  RETURN: REM see text for this
  unusual construction
```

This obtains the grades one at a time, counting them in with the variable NGRADES, and storing them in array GD$ - the grade names. Similar code is used to input the list of teams.

There is nothing very difficult in the rest of the program. First the list of grades is input, then for each grade it asks the number of sections. For each section the list of teams is obtained, and the routines in the second program used to print the draw for each section in turn.

In the final version I used long variable names, and spaced the program well. If there is a reason for squeezing a program, such as space restrictions, I prefer to use a utility to do the squeezing, and keep both versions. There really isn't much fun in deciphering FORM=ATOLL:READY:NEXT. The variable name SECTION has to be abbreviated because it contains the reserved word ON.

The final program includes a few extra lines to format the output. This is the first area for you to improve, such as by counting the number of lines on a page and skipping appropriately. There are a few notes in the program about commands which differ between machines. LPRINT is the MBASIC command to print output to the printer; you may need to change this for your version of Basic. I've renumbered the program, mainly to make it easier to type in if you wish to.

There are many other ways of writing this program, and many other ways of organising a draw. The program could be expanded perhaps to assign grounds or courts for each game, or umpires. Let me see what you can do.

```
10 DIM T$(100), GD$(100): REM gross
  overestimates!
20 CLEAR 2000: REM clear string
  space, if required.
30 CLS: REM clear screen — change
  if necessary.
40 PRINT "Type subject of draw";
50 GOSUB 540: REM get a reply,
  which might be the "null" string.
60 IF X$ = "" THEN GOTO 550: REM
  all finished.
70 LPRINT X$; "draw."
80 FOR I = 1 TO 6 + LEN (X$): LPRINT
  "-";: NEXT
90 LPRINT: LPRINT
100 PRINT: PRINT "Type the grades
  in the "; X$;" competition, one at
  a time:"
110 NGRADES = 0
120 PRINT "Next grade:";: GOSUB 540
130 IF X$ ="" THEN GOTO 150
140 NGRADES = NGRADES + 1: GD$
  (NGRADES) = X$: GOTO 120
150 IF NGRADES = 0 THEN
  GOTO 550
160 FOR GRADE = 1 TO NGRADES
170 CLS
180 PRINT "How many sections in
  grade"; GD$ (GRADE);" ";
190 GOSUB 540
200 NSECTNS = VAL(X$)
210 IF NSECTNS < 1 THEN PRINT
  "There must be at least one
  section.": GOTO 180
220 FOR SECTN = 1 TO NSECTNS
230 NTEAMS = 0
240 PRINT "Type names of teams in
  grade"; GD$(GRADE);"section";
  SECTN;"one at a time."
250 PRINT "Next team:";:GOSUB 540
```

(Continued 78)

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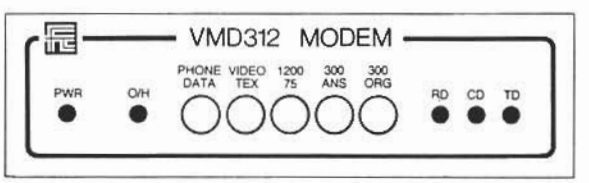
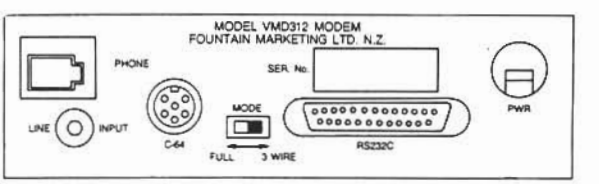


FRONT PANEL
CONTROLS AND LIGHTS



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This is one of the most exciting software offers ever made through the pages of *Bits & Bytes*. The entire package, comprising all of the above programs (incredible value at $158.40), is available for **only $117.00** (a saving of $41.40). This offer applies only to orders postmarked by 30th September 1985. **Don't delay.** Complete this order form and post it today.

☐ **Yes. Please supply me with the Otakou Software *Bits & Bytes* package. I enclose a cheque for ($117.00 + $2.50 p+p) $119.50.**

☐ **Please supply me with only the programs ticked above. I enclose a cheque for $ _____ (add $2.50 post and packing).**

DECLARATION: I agree to respect copyright as it applies to this software.

SIGNATURE _____ DATE _____

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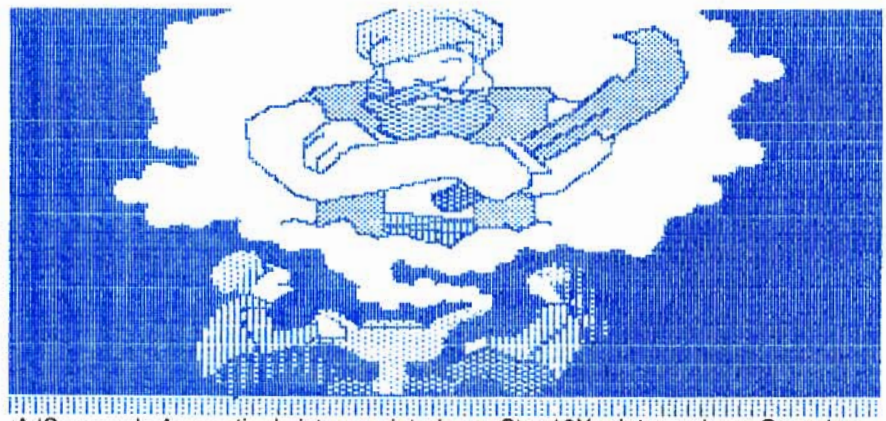
Software Review

The Sorcerer's Apprentice

by Gordon Findlay



A 'Sorcerer's Apprentice' picture, printed on a Star 10X printer, using a Grappler interface.

Last month I reviewed three of Otakou Software's releases for the Apple II family. In this article I want to look carefully at the fourth member of their package, 'The Sorcerer's Apprentice', which is a powerful, versatile graphics picture editor.

With a program of this complexity it is necessary to describe its functions and modes of operation in considerable detail before it is possible to draw any useful conclusion about the program's usefulness and worth. That being so, this article will first describe the purpose and aims of the package, then its mode of operation, before attempting any summary.

The purpose of 'The Sorcerer's Apprentice' — henceforth abbreviated to TSA — is to assist in the development of drawing, modifying, and using hi-res graphics for the Apple. It is a collection of programs, provided on one disk, which may be used to create pictures, save them, either as straightforward binary files or as sequential pictures on a DOS, or Pascal disk, and use them in other programs written in a variety of languages. Pictures once developed may be modified, checked, tested and kept in picture libraries.

The key to TSA is its use of a 'sequential pictures'. A sequential picture is stored on disk and manipulated as a set of drawing commands, and when recalled these commands are executed, very quickly, to construct the picture, from scratch as it were. This technique was first used in a commercial product by Penguin Software, in their graphics systems. This redrawing sounds slow, but most definately isn't. For comparison, I drew a rather complex picture, involving many shapes and fine detail, and stored it as a sequential picture, and separately as a direct binary image. The comparisons are interesting. The direct image file occupied 33 disk sectors; the sequential file just 10. Working in Basic, recalling the direct image from disk took roughly the same time as redrawing the sequential commands. Redrawing a sequential picture took no more than a couple of seconds longer than reloading a binary file, and sometimes took significantly less time.

TSA has several modes, entered from the outer, command mode. Naturally, the first mode you are likely to use is the 'draw' mode. Here you have a flashing 'cursor', which is actually a cross, rather like a surveyor's crosshair. Movement is by the arrow keys if running on a //e, using the return and '/' for up and down a [ ]+. Movement is at various speeds, using 'accelerator keys', such as shift and the Apple keys in combinations to choose whatever speed is appropriate. At its highest speed the cross really moves, yet fine control is dead easy as well. Unlike many of the graphics packages on the market cursor movement is entirely from the keyboard, rather than by joystick or paddles. The useful variety of speeds and thoughtful selection of keys makes the control of the cursors very quick and precise.

In draw mode you can add straight and curved lines, place spots of 8 types, and fill areas. The fill routine is fast and

(continued)

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quite intelligent, by Apple standards. Curves are drawn by marking the two endpoints, and another point through which the curve is to pass. At any time a command can be removed, using an 'undo' key. Help screens may be recalled at any time too, as may the colour palette, of which more later.

Draw commands

A full complement of drawing commands is provided for you to use in your artistic endeavours. Text may be added anywhere in your drawing too, using large or small lettering, in normal or reverse colours. Fonts may be specially developed — several are on the disk — or the DOS toolkit fonts and font editor used.

Once a picture is developed, and the manual contains lots of advice about common problems, and useful techniques for drawing various shapes, it may be saved from command mode. Saving as a sequential picture file requires much less space on disk, as indicated above, and enables later editing. Binary pictures may be saved, and later used as backgrounds to another picture. They cannot be edited in the same way of course.

Edit mode is the one you use when correcting, modifying, changing or what have you. Think of this as a simple word processor. You are able to move back and forward through the drawing file, checking what happens at each step at speeds from slow motion to full steam ahead. Commands may be altered, added, or removed at any point in the picture. More extensive editing makes use of the 'zap' mode, which operates on a portion of the picture only. This portion is separated out, and may be rubbed out, moved about the screen, copied, rescaled or what have you as required, before being returned to the rest of the picture.

Colours are a mystery to the average Apple user. The fill, spot and text colours may all be different, and selected from a palette of 110, obtained by mixing one of eleven with another one of 10. Naturally not all of these are different in final effect — there are three whites — but the overall choice is quite startling. Many different combinations of coloured dots, stripes and bars may be put to good use, and the colour named 'shocking pink' really is! The colour palette may be recalled at any time, as part of the help screen arrangements, and is presented at any time a colour must be chosen.

Naturally there are many commands in such an editor. In use, the operator is presented with a line giving the options open at whatever point the program is at present. These messages may be temporarily removed to make the entire picture visible.

Cunning use is made of auxilliary function menus, accessed by striking the forward arrow key part way through commands. These appear less than obvious in the manual, but as only the relevant options are offered in practice it isn't necessary to wade through a lot of irrelevant choices.

Interaction with the user is consistent throughout the programs — 'Q' is always used for quitting to command mode for example. This makes learning the programs ins and outs quite easy.

Action shots

The Sorcerer's Apprentice allows quite a bit of animation and action in programs by permitting one 'picture' to include erasing and redrawing. A special 'wait' instruction is included to facilitate this. Text animation, like the 'Maxwell' demonstration that is so well known, is relatively easy. Pictures may be dumped to a printer, as I have done with one of the creations on the Twist-a-plot disk here. Customisation of the program to your printer is straight forward.

Picture files saved from TSA may be used in Basic, machine code, Pascal, Pilot and Gra-forth programs. Full explanations as to how, and which files are needed, are given in the manual, and I had no difficulty in any of these that I tried. Sequential pictures may be used in the Twist-a-Plot story teller described in the earlier review. Purchase of TSA includes a licence to use the parts of the program needed to recreate pictures in your own commercial programs, provided that Otakou software is acknowledged. The disk supplied is a normal, DOS3.3 disk, which of course cannot contain Pascal files. Instead, a utility program is given which writes the required files onto a Pascal disk — a neat idea. Another utility is provided to copy disks, including TSA. There is no copy protection at all, which is exactly what should be expected for a utility package.

The documentation is complete, written in a simple yet not condescending way, with everything you need to know to get full use of TSA. The manual is well produced, printed clearly on high quality paper, spiral bound with a colourful cover. The manual has both tutorial and reference sections but also has two limitations. There are examples, but only of the difficult bits. There needs to be more complete examples of the normal use of the package, and of integrating the pictures into Basic programs, as well as the examples of potential traps. The other limitation is the layout of the manual — it isn't as easy to find your way around as it might be, although there is a complete index. A consolidated list and description of all the programs on the disk would help a lot.

The strong points, compared with others, of TSA are its ease of use and versatility, its extended picture editing mode and its price. At only $50, I had no hesitation in buying a copy, and regard it as a real bargain.

Lastly, the menu we've all been waiting for; Info, the one with the program author's name on it. It also contains a very comprehensive help page which details all the available functions, which can be rewritten to taste, as they are ASCII text files.

To use MouseCalc to set up templates (spreadsheets without figures) is really very enjoyable. The mouse allows formulae to be defined, the blocks of cells to be specified, without the tedium of repetitive typing. Entering figures with MouseCalc on a larger spreadsheet, where there may be a lot of single cell scrolling may feel a little cramped. With 16K's of information on the screen, MouseCalc can be a little slow to redraw the screen in double hi-res graphics. Manipulation of data in a spreadsheet though, with all these on-screen, readily-available, mouse-driven commands is really simple, easy and yet powerful.

Documentation

The MouseCalc manual (translated from its original French) is modelled after Apple's own documentation. Presented beautifully in a ringbinder, replete with lots of screen dumps, extra notes and clear headings, the Tutorial in the first part of the manual explains, with the minimum of fuss or overly technical language, how to get MouseCalc up, running and calculating. It is an excellent beginning.

The Referent part of the manual I find somewhat less satisfying. Although presented as nicely as the Tutorial, it doesn't explain all of MouseCalc's features fully and would benefit from a more coherent structure.

Summary

MouseCalc is a very advanced application utilising Apple's Mouse//. It begins with the bold concept of Macintosh emulation and, with the liberal use of pull down menus and Mouse interface, achieves its aim. The spreadsheet is created very simply with the Mouse and it lacks nothing in functions as well as including the very useful graphing capability. This is achieved by the use of double hi-res graphics which, unfortunately, also proves detrimental to its screen scrolling speed.

If spreadsheet applications with the Mouse is your cup of tea, then go for it. MouseCalc, at $399, is available from most Apple dealers.

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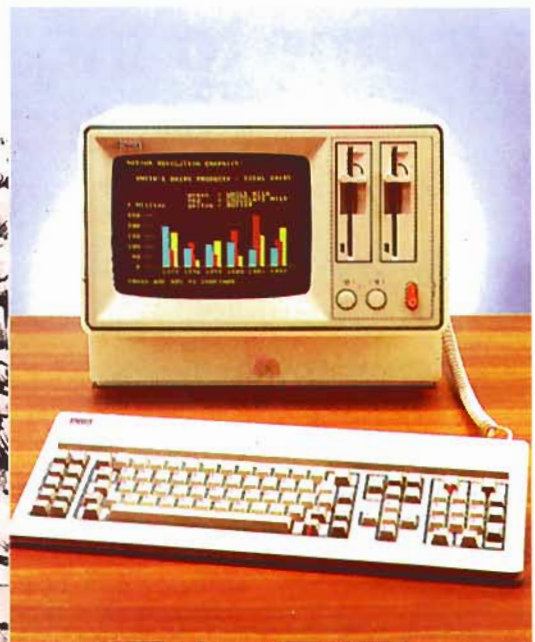

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At last a videotex service for computer users

After more than a year of research and planning, Bits & Bytes is pleased to announce the launch of a videotex service for computer users. It is called Computex and we believe it will add a whole new dimension to the power of your computer — providing you with a lot of useful applications and fun as well.

For those of you still unfamiliar with the term videotex, it is a system that, via your telephone line, allows your microcomputer to access all the power of a mainframe computer. The beauty of videotex is that (unlike teletext) it is a two way system; you don't just sit at your computer and watch what is happening. You can respond, order products, send electronic mail, download software and so on.

Computex, formed in conjunction with three Christchurch individuals, is a combination of the best features of similar services in the UK and USA, services such as Micronet and Compuserve that you have probably been reading about for some time.

This combination of features is probably unique in the world and makes Computex a very powerful service — one that we consider to be the ultimate computer expansion.

Not all of these features will be running at full steam on the Computex live date of October 1. But already there are more than 650 screens (or frames) in place for you to explore. One of the great things about Computex is that every time you access the service, you will find something new to investigate. What's more, you the user will be encouraged to add your contributions to Computex simply by using your keyboard. Hands-on is definitely what Computex is all about!

We at Bits & Bytes are obviously very excited about Computex, but as always, the magazine will feature independent reviews of Computex in coming issues and we welcome reader feedback.

Below, Jeff Whiteside, the general manager of Computex, explains the features and services.

Welcome to the Electronic City

You are about to be introduced to an exciting new world. Computex is a name that is destined to change the way you do some things. And it is here now!

Computex is a videotex service run in conjunction with Bits & Bytes for YOU the computer user. Its intentions are to broaden the scope of your computer use and to encourage communication with others around New Zealand via your computer.

Computers have often been regarded as being anti-social. Here is a dimension that makes computing sociable again, because it's highly interactive.

Computex is rather like an electronic city. Let's call it Computerville. All cities have a centre, square or something similar where people meet and have access to public facilities. Here are some examples of the facilities the Computex electronic city offers:

The Post Office

Have you ever imagined posting a letter and having the recipient read it one second after you have posted it? Well the Computerville Post Office can do it! It's called electronic mail: you compose your message on the screen of your computer and it is available for collection as soon as you post it — and you didn't even have to lick a stamp.

The Community Notice Board

Ever wanted to attract the attention of someone in Auckland (when you were in Invercargill)? Or wanted to sell that games cartridge that you got tired of six months ago? Or simply wanted to find someone to provide information that you needed? Computerville's Notice Board allows you to place a notice which can be seen by anyone around New Zealand. You can even conduct a public conversation by sending a reply to someone else's message.

The Local Newspaper

Computerville provides you with the latest in micro news to keep you up with the play. And the latest in world news and weather is available too!

The Meeting Hall

Ever used CB? If you have you discovered a whole new world and "met" many new people. This meeting hall allows you to talk to many other people live from your keyboard. It operates much like a CB channel but unlike CB covers the whole country. You'll be able to get involved with beginning BASIC courses, conferences with guest speakers, an on line bank robbery (!) or simply have a chat with other computer enthusiasts. The possibilities are endless.

The Library

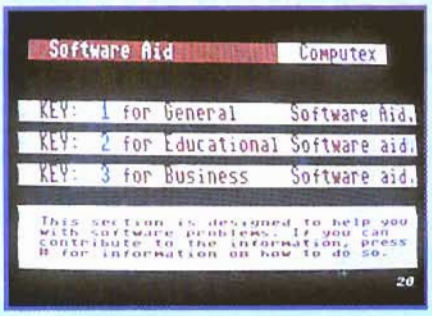
Unlike libraries you are used to, what you borrow from Computerville's Library doesn't have to be returned. Imagine having access to a large number of programs for your computer and being able to receive them through the phone line to be stored on your own disk ready for use. That's exactly what the telesoftware section of the computers library allows you to do at minimal or no extra cost.

The Suburbs

The suburbs of Computerville are Special Interest Groups (SIGs). These cover a wide variety of subjects and micros. Initially there will be suburbs for Commodore, BBC and Apple owners with education and business areas also under construction. Suburbs for other computer brands are already being planned.

The Repair Shop

Here, you can obtain information to assit you in coming to grips with your hardware and software. Ever wanted to ask someone when you really needed help? At the repair shop there's a friendly ear ready to listen to yo.



The Shopping Arcade

This section has been set aside for you to be able to shop from home. We have a number of retail shops displaying their prices and specials. You'll have direct communication with your favourite micro store and there is a general store section featuring non-computer retailers. Shop from the comfort of your armchair.

The Games Parlour

Now you can play interesting games, sometimes involving other people. No time to get bored here! Have computer, will play!

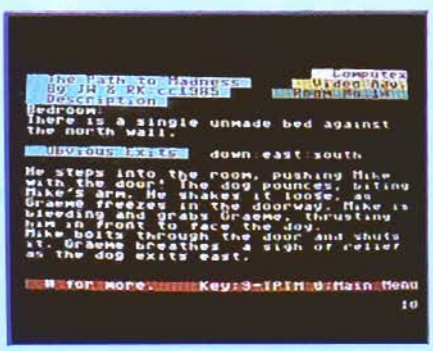
Public Relations Office

There to help you if you have any problems finding your way round Computex.

The Cross Roads

You'll also have access to one of New Zealand's leading videotex services, ADITEL. This is a rapidly expanding service providing consumer, business and farming information.

Computex provides all these things and more. The emphasis is on interaction with other users and participation is the key. Support it and it will support you even more.



What you need: What it costs

Both these questions depend on whether or not you already own a modem and communications software for your computer.

Any modem with a 1200/75 baud transmission capability that can be connected to your computer (usually via the RS 232 port) can be used to access Computex. So if you have one of these you don't need to buy another modem.

Similarly, any communications software with a videotex capability can access Computex, but, it may not allow you to download software from the Computex telesoftware library.

Because of this we are asking manufacturers and distributors of communications software to submit a sample to us (P.O. Box 13-162, Christchurch) to approve for Computex use. In some cases we will be able to provide a public domain terminal program (no graphics) for the sole purpose of downloading software.

If you already own videotex communications software and want to know whether it will download Computex telesoftware then write to us and we will tell you.

The initial registration fee is $99. This is a once only charge to cover our costs in registering you on the mainframe computer. There will be an annual subscription but that won't be chargeable until after your first year on Computex and will be considerably less than the registration fee. After you have paid your registration fee the only costs are for the time you spend on the service.

The Post Office charges you eight cents per minute (it is added onto your ordinary telephone bill) but this applies from anywhere in New Zealand. There are no extra toll charges no matter where you live. In addition, the mainframe computer operators will charge you 17 cents a minute if you access Computex from 6am to 6pm on weekdays or 10 cents per minute if you access the service at other times.

Finally, some frames, such as the more sophisticated telesoftware, will carry charges. But you will be warned about these frame charges in advance and it will be entirely up to you to decide whether you want to incur them or not.

Costs for non-modems owners

If you don't own a modem, or at least one suitable for Computex use, then that is the first thing you need.

To assist in this area, Computex will be offering a suitable modem. Costing $399, which includes the Computex registration fee (normally $99), this modem can be used with any computer with an RS 232 port. It also has a built-in interface for Commodore 64 owners but you will also require a cable for your particular computer, costing $29.95.

Other modems may work equally as well and we are negotiating with other computer and modem distributors who wish to offer free Computex registration with the products they sell. However, there is a shortage of suitable low-cost modems available in New Zealand at present and we are fortunate to have sourced this supply. This modem is called the VMD-312 and is manufactured in New Zealand by Foundation Marketing. This modem also allows you to access any other videotex service as well as club bulletin board.

Finally, you will require communications software to allow you to access Computex and download telesoftware if you wish. We will be offering the Communicator software for the Commodore 64 developed by Fountain Marketing in consultation with Computex to ensure it can download telesoftware. The Communicator costs $49.95.

If you don't have a suitable jackpoint on your telephone to connect a modem you will also need the Post Office to install one of these. This costs $40 and the Post Office provides a quick service for videotex jackpoints (within two weeks).

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Wellington Computer Show

The Wellington Computer Show was a roaring success this year with a programme of seminars and an exhibition which attracted record crowds.

The Christchurch Computer show is next on the agenda and already this looks like being something of a blockbuster with record space bookings and some special attractions which we'll tell you more about next month.

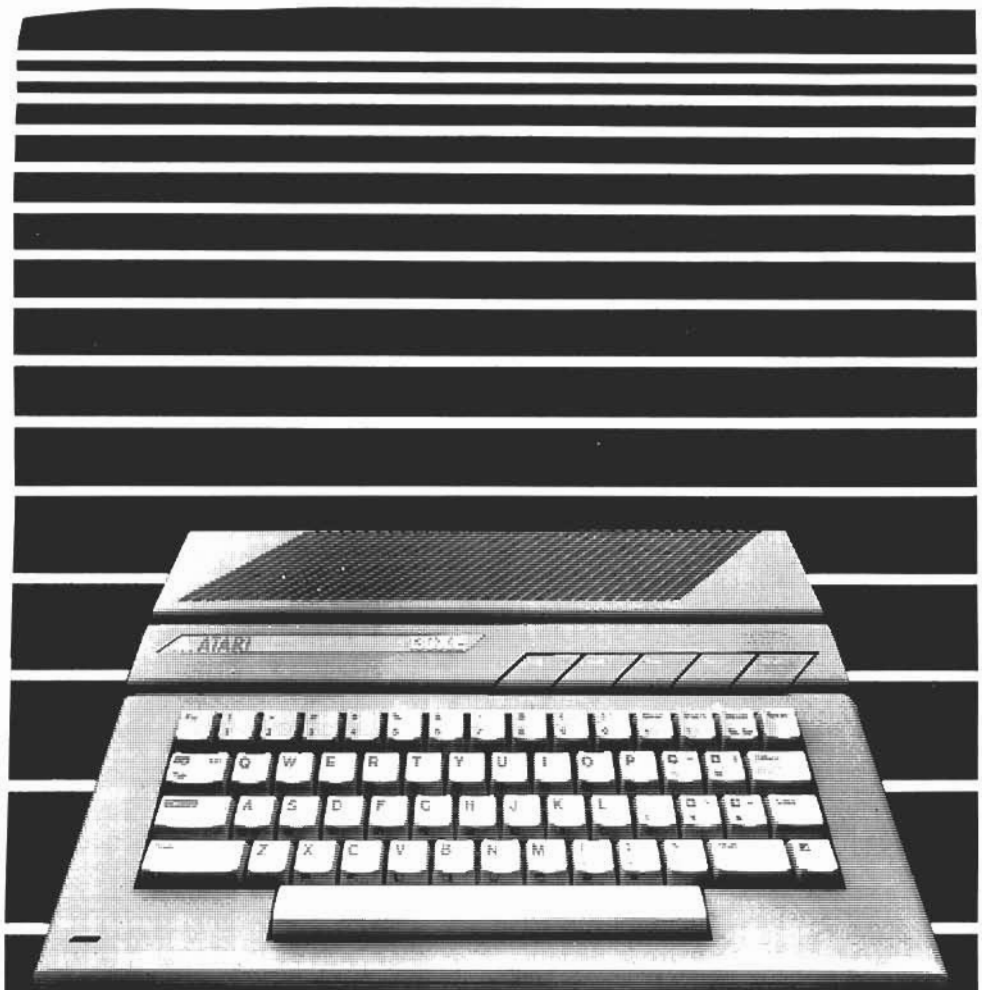
On the subject of shows, bookings are already underway for PC86 in Auckland and after the Wellington success a number of companies have already committed there for next year too.

Computer companies are getting behind the concept of dedicated shows in the three main centres and their participation and suggestions as to seminars and guest speakers and all contributing to make these shows of real relevance to computer users and would-be users.

Incidentally, the Bits & Bytes Software awards will again be a feature of the activities at PC86 and we'll be posting details on this in future issues.

Charlie was a great host throughout the three days of the show.

LEFT: It was all hands to the mill on the Bits & Bytes stand. From left, Jocelyn Howard, Christchurch sales, Mike Howard, who managed the seminars (amongst other things!), Marc Heyman, organiser and delegator, (front row), Gaie Ellis, editor and sometimes sales person, Paul Crooks, keeping the spirits high and Dion Crooks. . . where's Dion? Dion manages the Book Club and has just relinquished the awesome job of producing Bits and Bytes.



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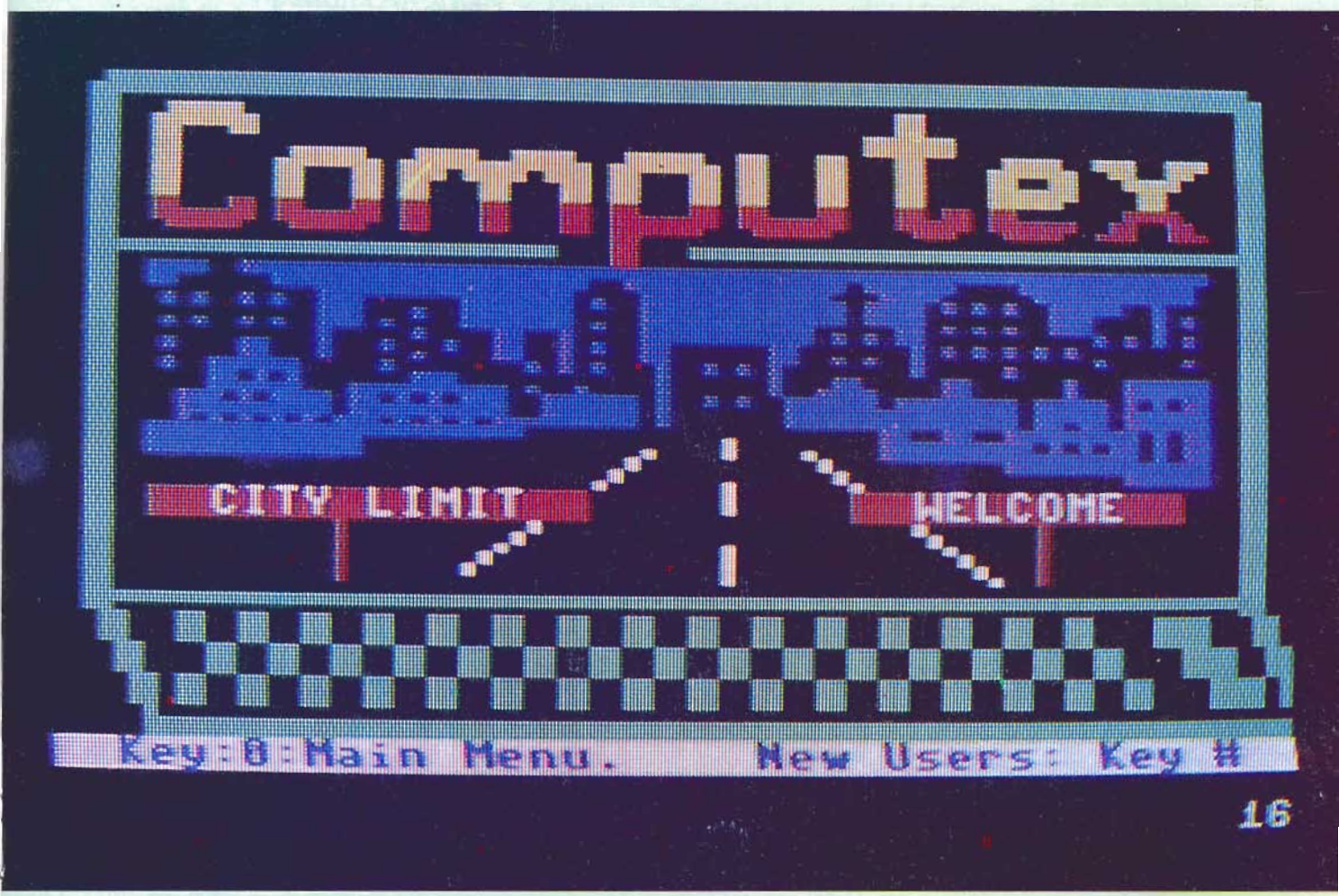

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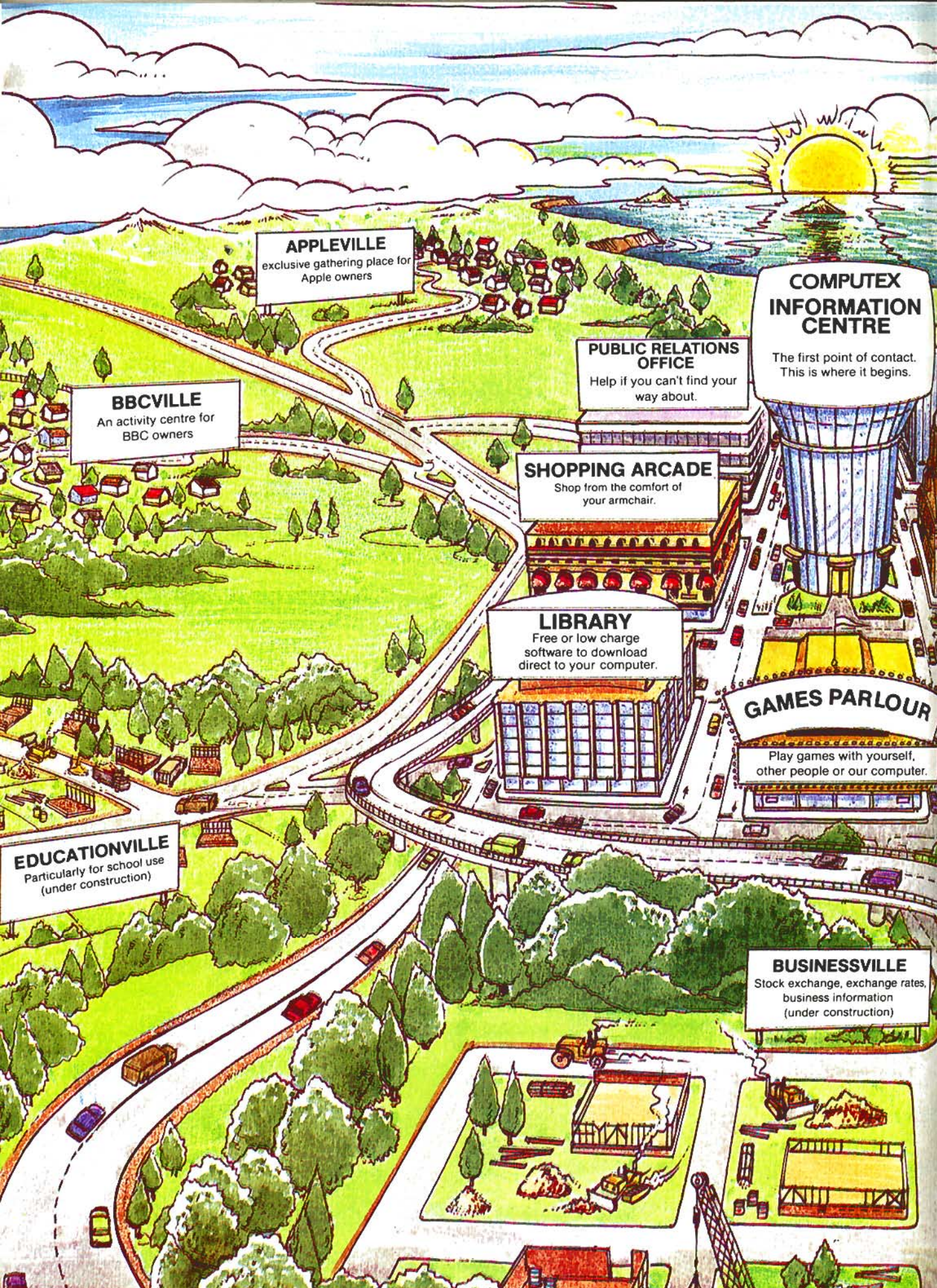
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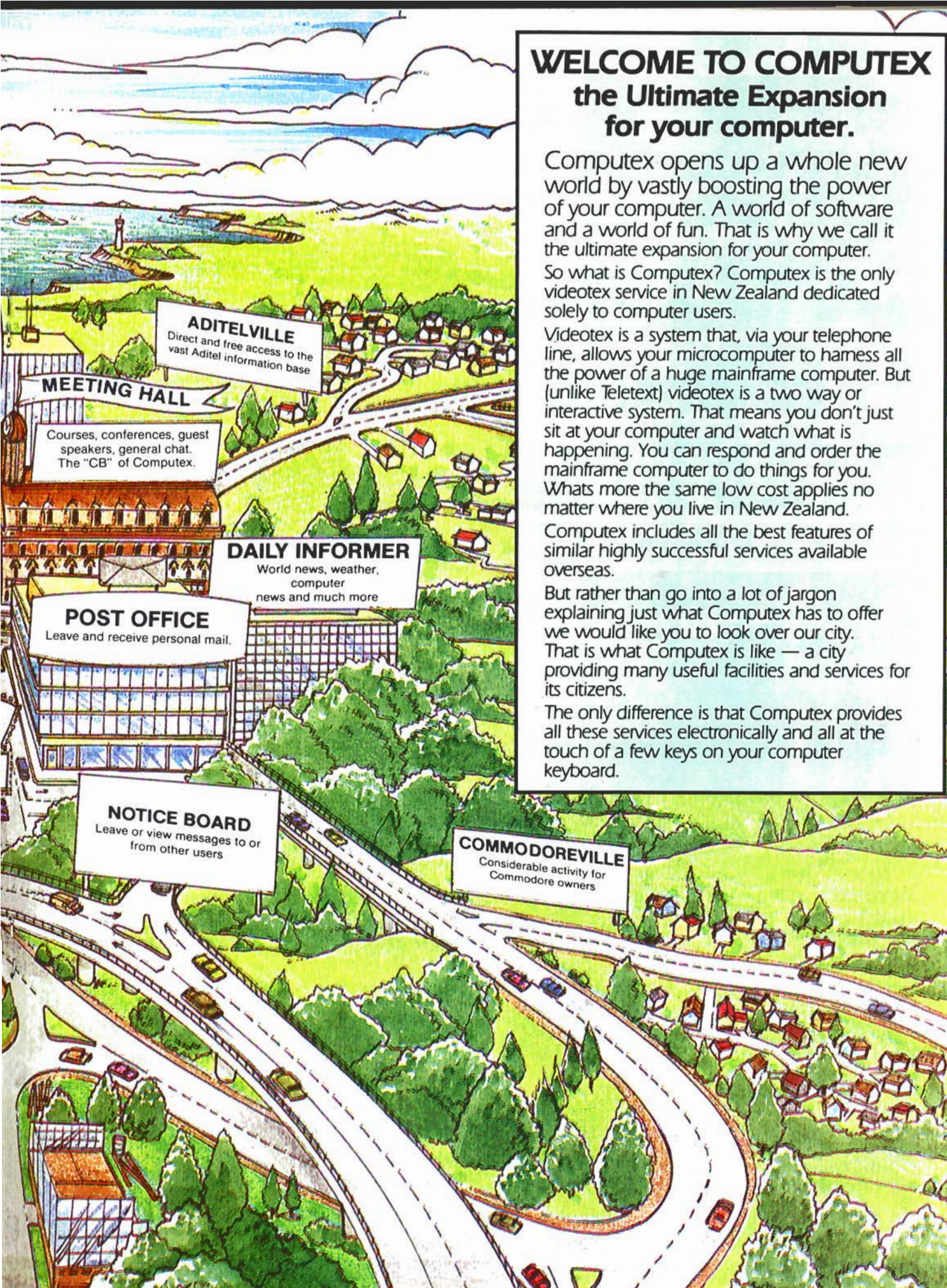

WELCOME TO COMPUTEX
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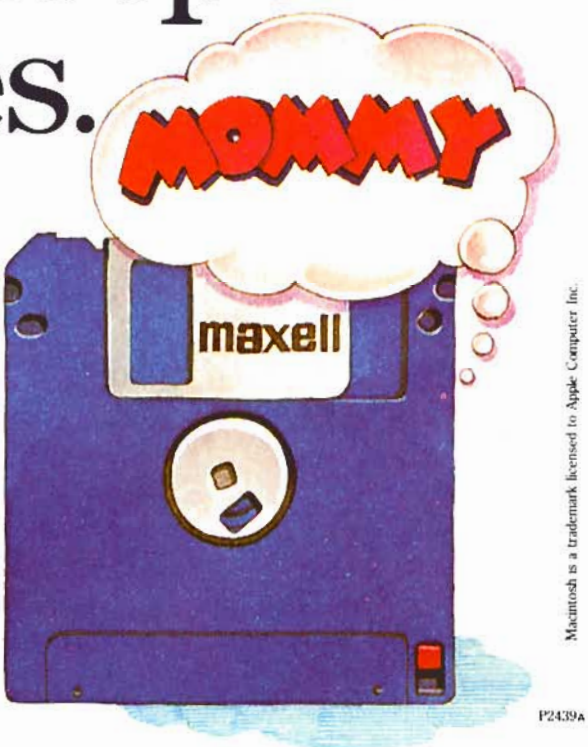

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P2439A

Sperry **Information Systems** have combined efforts with More magazine to launch the Businesswoman of the Year award in New Zealand. This year's winner Sue Suckling, Christchurch, took away a Sperry PC amongst a bevvy of prizes which included a trip to London.

No stranger to travel though, Sue who is the general manager of Pacific Foods, has forged new markets with sheepmeat products overseas and has opened up new opportunities for the country's flagging meat industry. There were more than 85 entrants in the awards.

"Perspicacious penguins prize Tandy 100s too,
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That was the winning caption in the recent Tandy contest sponsored by Computer Advances, distributors of Tandy and the winning entry came from Mr K Eyre, of Auckland, pictured here with managing director of Computer Advances, Keith Redit.

It wasn't an easy task to decide the winner from the hundreds of entries. Second prize went to B Turnell of Waikeria with this clever caption: "10 REM << * > HUMAN BEHAVIOUR STUDY > * >>" and third was W I Wallace, Wellington with "I see icy I/C's".

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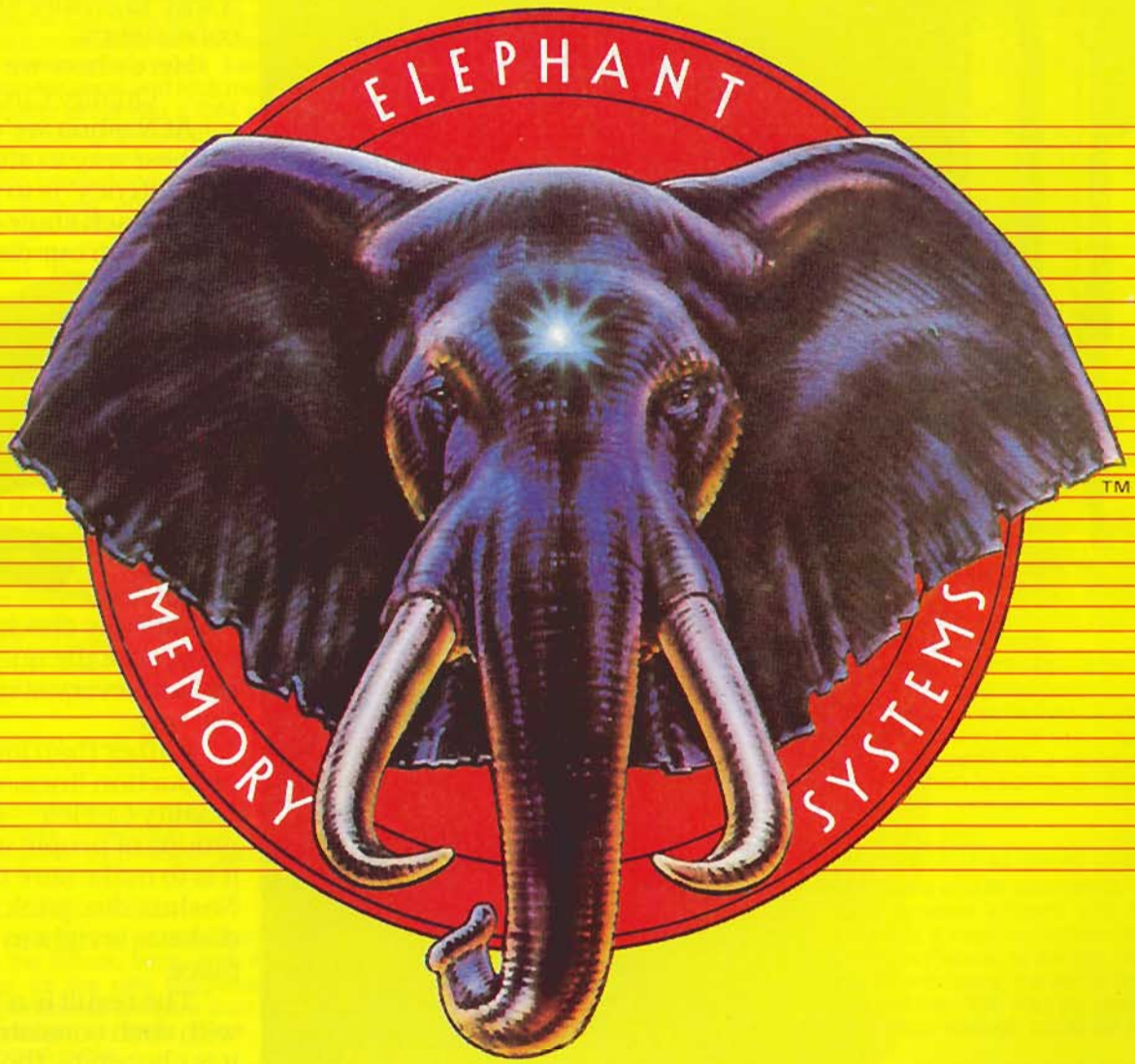

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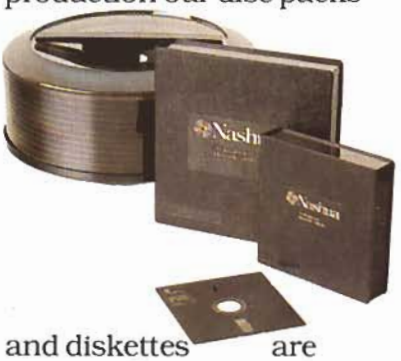

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Crashing through the 'Silicon Rally'

By A.R. Mitchell

The only in-field computer programme during the recent AWA-Clarion International Car Rally was the result of a casual conversation with a friend.

We were coming back from Wellington on the plane and Nick mentioned that a friend of his had a C64 and was looking at using a spreadsheet programme to keep track of cars during the upcoming international rally.

After thinking about it overnight I phoned Nick and offered to custom write a programme if he and his friend were interested. They were and thus started many late nights.

Nick, like myself, is a radio amateur and we have both been involved with car rallys on the communications side for some years.

The programme was to be for the Subaru team sponsored by Motor Holdings. Nick and his friend Brian discussed with the team the sort of things the programme shold have and they gave me the initial specifications.

The programme needed to be able to input start and finish times, calculate elapsed time, sort the cars into winning order by both overall and class groupings, find out where a car was last seen, be able to correct start and finish times, and sort the cars for a particular stage only.

In addition, each of the sort routines should have the option of being sent to the printer.

It seemed a tall order but by tackling it methodically, one option at a time, it all came together surprisingly quickly.

Checking rivals

The idea of the programme was to enable the Subaru team work out their placings as the rally progressed and also to be able to compare their relative performances in each stage against their closest rivals.

There was no way that a C64 could keep the start, finish and elapsed times of 72 cars for 48 stages in its RAM and work the programme as well.

I solved this by writing a large random access file on disc for the start and finish times, so that they could be accessed at any time to make necessary alterations, and to hold the elapsed times in an array until they were down-loaded to a sequential file. This latter step was done from time to time to ensure that a power failure would not result in too much data loss.

A power failure was a real possibility as this system was to be run in a van located centrally to each day's events. The power would come from a generator which, if nothing else happened, would at least need to be stopped from time to time to refill the petrol tank.

With as many bugs located as possible, and quite a number of error traps, the programme was ready for the first day of the rally.

Unfortunately we were not able to test the system on a smaller rally before the big one, as there were none scheduled.

Nick and Brian's preparation was even more strenuous than mine as they needed to get the other equipment ready.

A motor home was to be used and fitted inside it were 8 radios, computer, screen, printer, photocopier, mocrowave and up to 5 people.

They certainly had a job on their hands. It turned out that for the fortnight before the rally they were up past midnight every night, and this was in addition to their normal jobs.

A large custom-made roof rack was made to hold all the antennas, and inside, a console was made to accommodate two radio operators on one side and two computer operators on the other.

The intention had been to use a C64 and 1541 drive, however a week before the event Fountain Marketing very kindly loaned an SX64 to the group, which made the layout on the bench much easier.

The first day of the rally dawned bright and while I lay in bed, Nick, Brian and their helpers made an early start for the briefing at Motor Holdings.

Then it was off toward Helensville to find a suitable location for the first day.

The rally started and it was all on. The results came over the radios from stations at the start and finish of each stage. These were handed to the computer operator, who entered them as fast as possible.

It was soon found however that results can be received faster than they can be entered.

It crashed

There was only one major problem in the morning, someone turned the printer off in the middle of a print and the programme crashed out.

The programme could have been re-entered, without loss of data, with a simple GOTO, but they weren't to know that.

So data entering started all over again.

Later in the day the sort routine for the individual stages was creating negative elapsed times if two sorts were done, one after another. They decided to play safe with the data they had, saved it and called it a day.

At 9.30pm I received a call from Nick with the bad news and so I told them to come around. They must have broken a few speed limits on the way for they were soon knocking on the door.

We examined the offending part of the programme and almost by chance found that I had typed one wrong variable letter in a PRINT statement — but that's all it takes.

Soon corrected and with a few more input error traps included Nick and Brian were on their way at 11.30pm, but for them it was only the start of a few more hours work.

The rest of the rally was uneventful and the programme performed acceptably.

The problem as far as the Subaru team were concerned was the delay in obtaining the results from the computer. This however was largely controlled by the speed with which the results were obtained from the field.

Results would arrive by radio about 10 minutes after they happened in the field and by then it was almost too late to be useful. Plans are underway to speed this up and to provide for a more selective group for which to compute results

Took its toll

The rally had its lighter side for the motor home and its occupants.

One location chosen just easy of Huntly had a track so narrow leading to the minute Plateau at the top, that when it was time to leave, the motor home had to be backed 300 metres before anywhere large enough could be found to turn in.

The very late nights took their toll on the operators; Nick being so tired at the end of the event that the disk with the final data bears the inscription "RALLY '84".

As an in-field programme the limitations are as previously mentioned, however it has been decided to run it as the official results progrmme for the Hell a Lights Rally in early September.

For this purpose it is being coverted to run on Nick's own computer, as he feels more comfortable with his own keyboard.

Any car club interested in this programme for their own use should contact the writer at 55 Shoreham St, Blockhouse Bay, AK 7.

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(COLUMN WIDTH)							
40 CHARACTERS PER LINE	YES	40 CPL	YES	YES	YES	YES	YES
80 CHARACTERS PER LINE	YES	80 CPL	YES	YES	YES	YES	YES
66 CHARACTERS PER LINE	YES	66 CPL	NO				
132 CHARACTERS PER LINE	YES	132 CPL					
(PAPER HANDLING)							
FRONT LOADING FOR EASY PAPER SETTINGS	YES						
BUILT-IN PRINTER STAND	YES						
PRINT ON POST CARDS	YES						
(WARRANTY)							
ONE-YEAR WARRANTY	YES						
(SOFTWARE COMMANDS)							
DOUBLE STRIKE	YES	DOUBLE STRIKE					
EMPHASIZED	YES	EMPHASIZED					
COMPRESSED	YES	COMPRESSED					
UNDERLINE	YES	UNDERLINE					
SUPER/SUBSCRIPTS	YES	SUPER SUB SCRIPTS					
ITALICS	YES	*ITALICS*					
DOUBLE DENSITY BIT IMAGE	YES	CR					
(CHARACTERS)							
9X9 FONT	YES						
TRUE DISCENDERS	YES	abcgjpqyabc					
ITALICS	YES	*ITALICS*					
COMMODORE GRAPHICS	YES	♠♥♦♣ ⌜ ▒ ▚ ● ┤ ← ┬ ↑	YES	YES	YES	YES	YES
(OTHER FEATURES)							
SINGLE DENSITY BIT IMAGE	YES	CR	YES	NO	YES	YES	NO
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Econet and Multi-Player Simulations

by Pip Forer

This month's column is for schools and programmers. It is about writing software in a very neglected area: software for networks. This is not just about versions of 'stand-alone' software that will run on a network but about software designed from the ground up to use all the facilities a network can offer.

For me the most interesting of these is not the simple sharing of printers or disks but the creation of programs under which several users communicate and interact. At its simplest this could be an 'opinion-poll' program where all machines are delivered a question and a central machine then collates and displays the responses from all machines. At its most advanced it could be a multi-player simulation of a process in which human interaction was important (for instance a business training game).

As a backdrop to what follows, imagine we are developing a program in which we want players at different machines to role-play shop owners. Each one is to get a map of the distribution of customers and all existing stores and then decide whether to add a new store to their holdings or not and if so where to put it. We then want to call together all the new store decisions and add them to the map, allocate our electronic shoppers to shop at their nearest store and send a revised map down to all the teams for the next round of the simulation. How could we do all of this? One answer is to have a single 'world machine' on the network, which runs the whole show, and a series of 'team machines' which administer the choices to each team and keep in communication with the world machine. This sounds quite complex, but Econet has a series of calls which make this a lot *easier than it may seem. The answer is* to use some of the operating system calls provided for Econet programmers.

Who's who

This month we look at just one aspect of this: discovering who is on the network. Suppose we establish a world machine that will produce a map of where consumers live and make it available to anyone who wants to play the game. There are primitives available to allow users to pass information between machines under tight control (transmit or receive) or more liberally (inter-machine PEEKs and POKEs), so passing the map information about is going to be possible. The more important question is, 'How does the world machine know what other machines or users are out there at any time and if they want to be part of the simulation?' We can place a unique code value in a specified area of RAM which identifies a player from other current users (and this can be interrogated by PEEK calls) but how do we know who is out there in the first place?

The system manager has access to a routine called *USERS which will do this, and prints the user's names and the number of the machine they are on, onto the screen. We require something like this, but workable from BASIC. The answer is to use an Econet call which allows the user to interrogate the network environment. The listing below will read your network at any time and return the names of all users to array name$( ) and their machine numbers to array player%( ). How does it work? It relies on indirection operators and the use of OSWORD calls.

```
 1 REM WHO IS OUT THERE?
10MODE 4
60DIM player%(10),name$(10)
70DIM whob% 29
80PROCwotstn
90 END
```

These lines simply establish arrays to hold up to ten users' particulars and reserve a protected block of 28 bytes of memory called whobk%. The procedure wotstn is then called. The code for this is:

```
100 DEFPROCwotstn
110 osword=&FFF1
120 cnt%=0
130   REPEAT
140     PROCget_stn(0)
150   UNTIL whobk%?4 >=1
160 REPEAT:cnt%=cnt%+1
170   PROCget_stn(cnt%)
180 UNTIL whobk%?4=0
190 FOR I=0 TO cnt%-1:PRINT
200 ENDPROC
```

This establishes the location of the OSWORD call, a call to the operating system which passes a block of memory across as arguments. It then accesses the procedure get-stn within two loops. The first one continues until the fourth byte in the 28 bytes of whoblk% is greater than 0. As we shall see this byte tells us how many users are on the system. When someone is logged on we progress to the second loop, which repeats continuously for however many users are present. The names of the users are then printed out, along with their machine number.

The next lines are the heart of the utility:

```
210DEFPROCget_stn(sid)
220   FOR I%=0 TO 7:whobk%?I
230   whob%?1=20:whob%?3=
231   A%=&14:X%=whobk%:Y%=
240   CALL osword
250   N%=whob%-7:player%
260 ENDPROC
```

Advantage: user

This procedure takes advantage of a network OSWORD call that allows the user to interogate the user environment. If we set A% = &14 before the call we communicate with the file server. We send across seven bytes (hence line 220 sets all of these to zero before we initialise them in line 230). The third byte carries an operation code (here 15, report on users). For this function the

seventh byte gives the number of the first user we are interested in, where number means only the place in the list of recorded users held by the fileserver, and the eighth byte holds how many users are required. Line 231 sets A% and sets X% and Y% to point to the location of whoblk% in memory. Line 240 actions the call.

After this call the routine sends your requested information back to the same buffer, starting at the fifth byte. The value in this byte gets placed in to player%( ) and we use the $ indirection to get the user's name into name$( ). Since the procedure is called by passing a value from PROCwot-stn to the variable sid, which itself goes up by one each go from the REPEAT loop enclosing the variable cnt% (line 160), we get to see all the users. The interrogation stops when no more users are to be found. (see pages 63-71 of the Econet Advanced Users Guide).

Now you can start communicating with the know users, and doing some quite interesting things. This means looking at how to pass information between machines. We may return to look at that component at some future time.

PROFORMA and Pricing

I understand that the authoring language Proforma, which we reviewed earlier this year, will shortly be available in a version to handle all BBC graphics modes, including the highly useful mode 1. The cost of Proforma is $200 for a site licence, i.e. any and all uses within an individual school. Even better rates are available in some instances for purchases by groups of schools. Further information from John Collett, French Department, Waikato University or from A1 Computers, Hamilton.

BOOK REVIEW

MSX Exposed

by Joe Pritchard

This is an excellent book. It gives you detailed coverage of the MSX system (apart from the surprising omission of MSX Disk Basic), both the basic facts needed by the beginner and the more advanced material for the more ambitious programmer.

Fundamental information is given in the chapters on the MSX system, standard BASIC, data structures and variables, and cassete tape storage including setting up files.

The more advanced features of MSX Basic are covered in the chapters on programming the Video Display Processor, the ON commands, Joystick input with BASIC programs, using the Programmable Peripheral Interface and the MSX Memory Map.

One chapter is devoted to discussion of programming technique and sample routines. Machine code programming of the Z80 chip is not covered (there are several books available for this) but information needed to program MSX computers in machine language is included.

There is an Appendix on number systems and an adequate but not extensive index is provided.

The book is published by Melbourne House and costs $39.95. Thanks to Mrs. Bell of Bell's Techbooks Ltd, Wellington, for loaning me a copy to prepare this review. There was a lot of information relevant to Spectravideo Basic which is, of course, very similar to MSX Basic, some of which I had not seen in print before.

Reviewed by
Barbara Bridger

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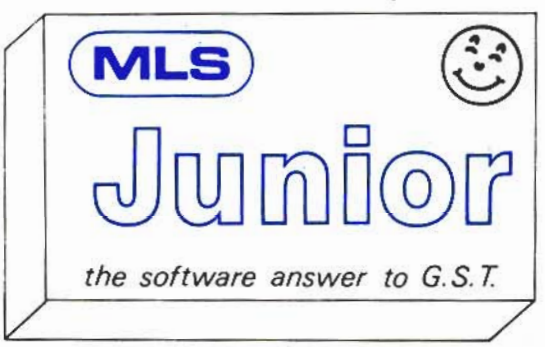

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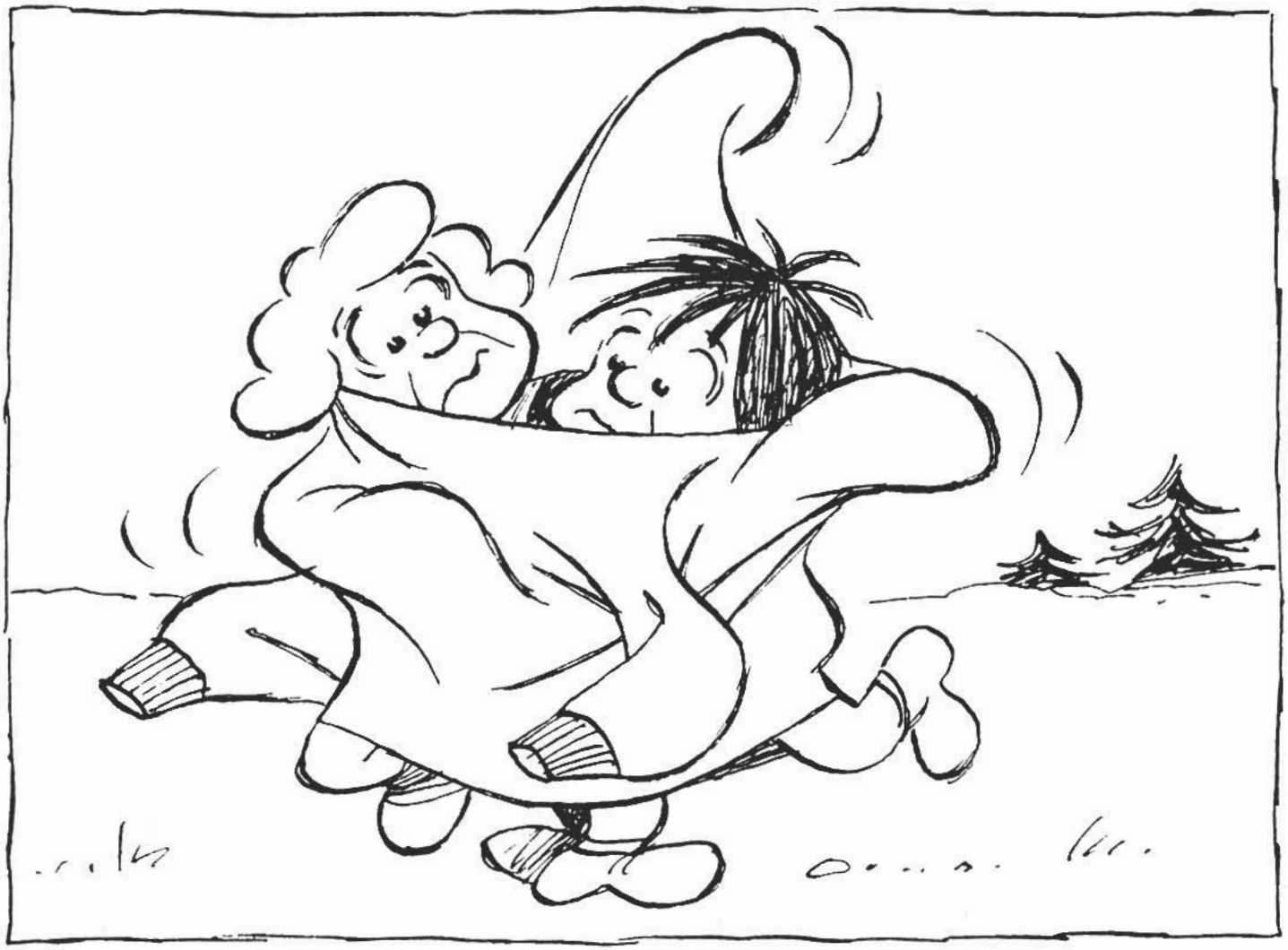

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Kiwinet or the IR/IP* Society? by Dave Keet

***Information Rich/Information Poor)**

In the June 1985 issue of 'Bits & Bytes' I covered the wide range of databases available to us from around the world — over 1200, with well over 100 million references, on such systems as DIALOG, BRS, and AUSINET.

What of New Zealand? How good is the access to our own literature?

In an article in "Database" magazine "How to lose a nation's literature: database coverage of Australian Research", Alex Byrne* explored the question of how well Australian publications are included in the international databases. He concluded that there were many factors which resulted in a 'loss' of Australia's (and by implication New Zealand's) literature in the databases. Databases 'bias' towards literature published in the database 'host' countries such as the USA; language factors (such as spelling), poor coverage of journal articles published, are all identified as elements which can 'swamp' smaller nations contributions.

Add to this the fact that there are a number of international databases to which we are denied access, despite the presence of our own information in them, such as the DOE (US Dept. of Energy) Energy database, and the present strong movement for creation of our own databases of our own literature is explained. It is not possible to rely solely on access to databases under the control of nations on the other side of the world.

New Zealand's databases

I have excluded videotex systems from this discussion.

In New Zealand, as was the case in other OECD countries, the Government has led the way in the creation of national databases. However, the database scene is diversifying rapidly. What follows is an attempt to detail some of the databases currently being created, which are of public interest, and are either now publicly available, or intended to be publicly available.

INFOS – Perhaps the most complete and successful local database is the Dept. of Statistics INFOS database which contains some 420,000 statistical series (or tables). This is valuable information for all planning exercises in both the public and private sector. The contents of the databases are listed in a published directory — 'INFOS Data Directory, 2nd ed. 1985', available from the Department.

INFOS is available online to those who have obtained suitable (IBM compatible) equipment, and a leased or dial-up line.

NZBN – (New Zealand Bibliographic Network) – The National Library has bought a software and database system from the Washington Library Network, (WLN) which forms the basis of the present NZBN. WLN uses the ADABAS Database Management System, with some 700 additional applications programs. NZBN Libraries (35 so far) are rapidly adding their holdings information to these records (equivalent to library catalogue cards) which deal mainly with books. Access is presently only available via the participant libraries. However, NZBN does have plans to connect to the Packet Switched Network, which would allow much wider access to this database, creating the possibility of a National Electronic Library available to everyone through their local public library, or perhaps directly, using their own microcomputers or terminals.

DSIR – The Department of Scientific and Industrial Research, has several databases available online through its ALICE system, on its own National Computer Network. Alice includes several interesting databases:

SIRIS – The Scientific and Industrial Research Information System database has been in operation since 1980. It is based upon the International Atomic Energy Agency INIS (International Nuclear Information System), and is compatable with it and other international databases. The database presently has about 10,000 records (entries with abstracts or short summaries of mainly scientific and technical document). SIRIS attempts to cover comprehensively, all New Zealand's scientific publications, or those written by New Zealand scientists and published overseas. Although beginning in 1980, the database includes much material from earlier years, and there are several projects to comprehensively index all publications on particular subjects, such as a project by the New Zealand Geological Survey to include all geological information since 1979 (about 10,000 records). Similarly, there is a joint project between the DSIR and the Standards Association of New Zealand to put all New Zealand's Standards on the database. SIRIS is set, therefore, to grow rapidly during 1985. A printed publication, 'New Zealand Science Abstracts' contains current material from the database, and is available on subscription from the department. Retrospective material added to the database will not be produced in published form.

FRESH – The Bibliography of New Zealand Freshwaters has about 10,000 records dealing with the environment — especially its lakes and rivers. It covers publications from the early colonial period until 1980. It was then closed and all new material is included in SIRIS. There is no printed version of the database.

COAST – The Bibliography of the New Zealand Coast (and Estuaries) is a similar file to FRESH; again, it is updated by SIRIS, and there is no printed version.

LIBRA – The Library Resources Application database includes all new (since 1982) books, journals, and reports bought by the 19 DSIR libraries. It is a very valuable source of information, including many manuals, standards, and scientific reference works. Most of the items recorded in the database can be loaned to the public. LIBRA contains about 25,000 records.

SIPS – The Science Information Profiling System is an interesting database; it records information about the expertise of DSIR staff. Searches of the database can find individuals from the department who are expert in more than 5,000 subjects, speak over 40 languages, and have contact with organizations all over the world. Its purpose is primarily to aid DSIR scientists and personnel in referring technical help requests to the best source of information. SIPS will not be made publicly available in its present form, but it is used when technical inquiries are made to the DSIR. The database includes information about more than 700 experts. There is no printed version.

BERRY – The Berryfruit database has over 4,000 references from any source in any country to documents about all aspects of Berryfruit, including growing, marketing, harvesting, and so on. It is produced by staff of the Division of Horticulture and Processing, at Riwaka. There is no printed version.

SOSRIS – The Social Science Research Information System is based upon SIRIS, but covers all New Zealand Social Science literature, (including economics). It is being created by the DSIR under contract to the NRAC (National Research Advisory Council). Before the end of the year the system will be transferred to the National Library, and will operate alongside NZBN. SOSRIS began in 1984, and presently has less than 1,000 records. It will grow rapidly over the next year, as information from Government departments and universities is added to it. Special bibliographies are being added, such as the Bibliography of Rural Society, produced by the Ministry of Agriculture and Fisheries; the Ministry of Works is coordinating its 'Planning Research Index' with SOSRIS. The database will be of interest to all sections of New Zealand Society. A printed publication, 'New Zealand Social Research Abstracts' is scheduled for publication before the end of the year, and will be available on subscription. Retrospective material added will not be published in printed form.

DISLIC – The 'Directory of Special Libraries and Information Centres' lists about 400 organizations with special collections of information, covering all subjects, and details means of access to the information, addresses, contact names, and so on. It is also published in printed form, available from the New Zealand Library Association.

BRANZ – The Building Research Association of New Zealand has recently bought a DEC VAX 11/750 supermini computer, and the CAIRS information retrieval system. It will be using CAIRS to create several databases of interest to its clients, including all documents received by its library since 1975. The BRANZ system will be accessible via the Packet Switched Network.

International Trade – The Canterbury Chamber of Commerce has had a prototype database listing companies, and their products in that area, for some time. They are now directing their efforts to including other Chambers of Commerce in New Zealand, and possibly overseas. The purpose of the database is to aid importers and exporters to match their needs with suppliers of products.

Future Developments

there are many other databases being created. Business information publishers with foresight are using systems for publishing which create data in machine-readable form; when the opportunity arises, they can be made available direct, via online systems.

ONLINE Public Access?

With so many databases, and potential databases already in existence, it's obvious that New Zealand is ready for an online public access system (KIWINET?) analagous to AUSINET in Australia, or BRS in the USA.

As we have seen, in the absence of a national online system, isolated initiatives are being taken by such organisations as INFOS. NZBN, and BRANZ, who are making their information on a cost recovery basis. This approach obviously has disadvantages: each system uses different commands and procedures, forcing anyone who wishes to use more than one source to learn a multiplicity of different systems, invest in different documentation and manuals, and in some cases use different equipment for different systems.

That they are forced to do this is suprising. All elements for the creation of a national public access system exist — the databases, the hardware and software, the telecommunications and the demand. Online systems for public access to both private and public databases are a growth industry overseas.

Their existence has stimulated the creation of databases which are an aid to business, industry, and government for decision-making, marketing, technical information and new information services. They are now rapidly becoming a part of the infrastructure of modern economies. New Zealand business and industry needs to have these sorts of information services available to it. The videotex industry has demonstrated what can be achieved in a short space of time.

The creation of a national public online access system for the more complex text and numeric databases, such as those covered here cannot be far away.

Expert Systems

There is a lot of publicity and interest in the commercial applications of Artificial Intelligence. One aspect of AI is the 'Expert System', using 'Knowledge Bases'. These are already well advanced in the USA and Britain, especially in the medical (diagnostic and treatment) field. Rapid growth is being experienced in business applications of Expert systems, with TAX advice, and business investment advice systems, at the forefront.

Expert systems can be extremely 'user friendly' with conversational expert system shells being designed to allow access to the information contained in the knowledge base. The knowledge base component is often more difficult and expensive to complete, as it involves capturing in a database all the knowledge on a particular problem, of an expert or panel of experts.

Knowledge bases and Expert systems will not totally replace videotex or online database systems, but they are bound to revolutionise this aspect of the information industry. They offer easy, assisted access to a distillation of knowledge on their subject. In New Zealand AI research is taking place right now.

Expert systems have been created in several universities. BRANZ and Victoria University collaborated in the creation of a prototype Expert system called DAMP, to advise on solving problems caused by damp in buildings. This development will continue at BRANZ on their new computing system. The DSIR has a project to investigate the creation of 'intelligent interfaces' between information systems, using PROLOG, an artificial intelligence language.

This sort of research is a strategic necessity in the rapidly changing information revolution that is going on today. As we have seen, with other information systems and services, the solutions found by other countries will be suited particularly only to those countries. We will have to create our own 'Expert systems' if we are to compete on an equal footing with other advanced nations.

Conclusion

New Zealand is in the midst of an information revolution. The creation of videotex systems, Expert systems, and Online databases are a part of that revolution, and a response to the explosion of information being created in the modern world.

Online access to these services and systems is the most cost-effective and only feasible means of giving access to this information to our citizens. This 'information infrastructure' is being constructed now; all interest groups in New Zealand need to plan for their own means of tapping into this information, which is relevant to all the sectors of our society. The marriage of computers, information, and telecommunications has already taken place, and the information contained in many databases will never be published in printed form.

Ultimately, the educational establishment — schools, polytechnics and universities will have to include teaching the use of these systems as part of the necessary skills of a literate person. The alternative is the creation of a new division in our society — between the information rich, and the information poor.

**Byrne, Alex. 'How to lose a Nation's Literature: Database Coverage of Australian Research'. Database, 6(3): 10-17. 1983*

Dave Keet is Head of the Database Development Section of the DSIR Central Library.

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Phone: 851-279

CHRISTCHURCH
P.O. Box 32054
Phone: 890-449

AWD 2609

ALICE Search Example

This is a sample search on the DSIR's ALICE system. The search software used is INMAGIC. The first search uses the SIRIS database, and the subject was "Computer software for Quality Assurance". The search was limited to 1984 only.

The second search is on the LIBRA database, and combined the search terms "Microcompouters or Personal computers" AND "New Zealand". The search demonstrates the essential features of the modern electronic library databases which are rapidly replacing the familiar card catalogues.

The searcher's commands have been boxed to distinguish them from the computers OUTPUT.

```
$alice                                   ALICE

        Automated Library Information Control & Exchange
        ------------------------------------------------

08-JUN-85 : SIPS now complete.. all divisions represented. See news.
14-MAY-85 : NEW VERSION OF INMAGIC - SEE NEWS

        The following options are available to you:

             0) Alice Help                  8) SIRIS:
             1) Alice News System           9) UDC:
             2) DISLIC:                    10) RADIR:
             3) FILES:                     11) ADOS:
             4) FRESH:                     12) COAST:
             5) LIBRA:                     13) SOSRIS:
             6) SIPS:                      14) DINO:
             7) RRSBY:
Please enter the number of your choice(E to EXIT): 8

                        One moment, please.....

    INMAGIC Version 6.3 (c) Copyright, 1981,1982,1983,1984 Inmagic Inc
                    ENVIRONMENT SUPERVISOR
Type Environment Name   OR   Press RETURN for menu   OR   Type HELP
                Enter choice: select
Enter name of data file (up to 8 characters): siris:
Enter user ID code: 11
INMAGIC - SELECT

Enter command, or press RETURN for list of commands.

*get de = "quality assurance"

#1 number of records:        7

*and de cs comput

#1 number of records:        4

*display using sir6:

SIRIS Database

SI8560084   TEMPORARY RECORD ONLY: PENDING PUBLICATION IN NZSA
     Assessing sampling plans

SI8560087   TEMPORARY RECORD ONLY: PENDING PUBLICATION IN NZSA
     Food inspection by x-rays

SI8560086   TEMPORARY RECORD ONLY: PENDING PUBLICATION IN NZSA
     If your statistician muddles you - fire him!. Some case studies in the
     dairy industry

SI8560088   TEMPORARY RECORD ONLY: PENDING PUBLICATION IN NZSA
     Quality assurance at AWA with the Peach mini-computer
11-JUN-85
get de = "quality assurance"
and de cs compet
#1 number of records:        4

*and ti cw peach

#1 number of records:        1

*display using sir5:

SIRIS Database

SI8560088   TEMPORARY RECORD ONLY: PENDING PUBLICATION IN NZSA
    Quality assurance at AWA with the Peach mini-computer.  Wheeler, D.
    Quality assurance; New Zealand.  no. 5:21-25.  (May 1984).  4
    appendices.

SC  E13; D17.
DE  QUALITY ASSURANCE; *MINICOMPUTERS; QUALITY CONTROL; INSPECTION;
    COMPUTER SOFTWARE; COMPUTER HARDWARE; *MANUFACTURING.

    The quality assurance team at AWA uses two basic computer programs for
    quality assurance. They are: 1) "Procal", which is a data based
    spreadsheet, and 2) "Hi-writer", which turns their "Peach" into a word
    processor. In this article he looks at the use of the Peach, and also
    how AWA manufacturing Division, and the Quality Assurance team
    operates.
11-JUN-85
get de = "quality assurance"
and de cs comput
and ti cw peach
#1 number of records:        1

*end
Do you wish to store the search in progress (Y/N)? n
Save search file (Y/N)? n
    INMAGIC Version 6.3 (c) Copyright, 1981,1982,1983,1984 Inmagic Inc
                    ENVIRONMENT SUPERVISOR
Type Environment Name   OR   Press RETURN for menu   OR   Type HELP
                Enter choice: change
Enter name of data file (up to 8 characters): libra:
Enter user ID code: 11
    INMAGIC Version 6.3 (c) Copyright, 1981,1982,
    1983,1984 Inmagic Inc
                    ENVIRONMENT SUPERVISOR
Type Environment Name   OR   Press RETURN for menu
    OR   Type HELP
                Enter choice: select
INMAGIC - SELECT

Enter command, or press RETURN for list of commands.

*get ti/de cs microcomput

#1 number of records:       44

*or ti/de cs personal & comput

#1 number of records:       53

*and ti/de cs zealand

#1 number of records:        5

*d u lib5:

<< DSIR Union Catalogue Bibliographic Display >>
                                                        LIBRA File
Title:          Bits & bytes : New Zealand's personal computer
                magazine
Place:          Christchurch
Publisher:      N. Birss and P. Crooks
Date:           0982-
UDC number:     681.3(931)
Location(s):                          XWS8210058     Bib. Level: S
  AS  5- 1983-
  CSI  1- 1982-
  LNU  1- 1982-
  WCC  1- 1982-
  WS  2, 4- 1982-
  WSB  1- 1982-
  WSWI 2- 1982-
                ----------------------------
                                                        LIBRA File

Corporate Name: New Zealand. State Services Commission. Computer
                services division
Title:          Guidelines for the procurement and use of
                microcomputers and word processors in the New Zealand
                public service
Edition:        Ed. 1, 1st rev.
Place:          [Wellington]
Publisher:      State Services Commission, N.Z.
Date:           1984
Collation:      37 p. ; 30 cm

UDC number:     35:681.326.32
Descriptors:    MICROCOMPUTERS; WORD PROCESSORS; NEW ZEALAND; PUBLIC
                SERVICE; EVALUATION
Location(s):                          XWS8411032     Bib. Level: M
  WS  BKS 35:681.326.32 GUI
  ALB  35:681.326.32 GUI
                ----------------------------
                                                        LIBRA File
Personal Name:  Beard, D.A.; Bond, A.F.
Corporate Name: New Zealand Heavy Engineering Research Association
Title:          Microcomputer hardware review : microcomputers
                available in New Zealand / prepared by D.A. Beard,
                A.F. Bond
Place:          Auckland
Publisher:      HERA
Date:           1983
Collation:      [80] p. : ill. ; 30 cm
Series:         HERA report ; R 6 -02
Notes:          Review and reprints of journal articles
UDC number:     681.326.32
Descriptors:    MICROPROCESSORS; MICROCOMPUTERS; COMPUTER SYSTEMS
                HARDWARE
Location(s):                          XWS8431718     Bib. Level: M
  ASI  B0b BEA 681.32
                ----------------------------
                                                        LIBRA File
Personal Name:  Beard, D.A.; Bond, A.F.
Corporate Name: New Zealand Heavy Engineering Research Association
Title:          Microcomputer software review : microcomputers
                available in New Zealand / prepared by D.A. Beard,
                A.F. Bond
Place:          Auckland
Publisher:      HERA
Date:           1983
Collation:      [80] p. : ill. ; 30 cm
Series:         HERA report ; R 6- 02/1
Notes:          Review and reprints of journal articles
UDC number:     681.326.32
Descriptors:    MICROCOMPUTERS; COMPUTER SYSTEMS PROGRAMMING
Location(s):                          XAI8400012     Bib. Level: M
  ASI  B0b BEA 681.32
                ----------------------------

*e
Do you wish to store the search in progress (Y/N)? n
Save search file (Y/N)? n
    INMAGIC Version 6.3 (c) Copyright, 1981,1982,1983,1984 Inmagic Inc
                    ENVIRONMENT SUPERVISOR
Type Environment Name   OR   Press RETURN for menu   OR   Type HELP
                Enter choice: e
$
```

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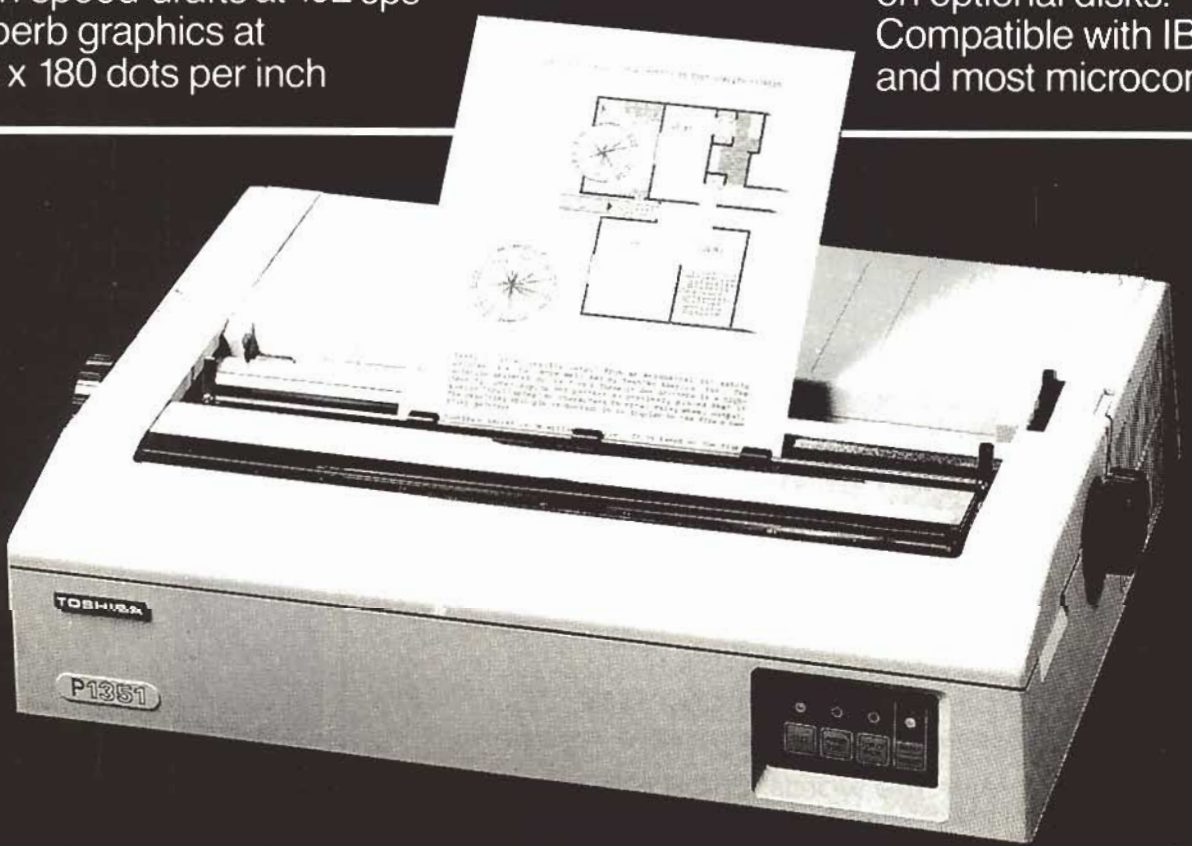

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A force to be reckoned with: MSX...tra

By Brian Wilson

At long last a true MSX computer has arrived in New Zealand — the Sony Hit-Bit computer. My first impression on opening up the box containing the review computer was of a very well built and finished computer, as I would expect from Sony.

The case feels very solidly built and is finished in an attractive black with grey control keys; I have a personal aversion to keyboards with lots of fancy colors. The keyboard itself is of a very high quality key switch type design, with 74 keys including 5 function keys, shifted to give 10 functions. On switch-on, these keys are pre-programmed to the following functions:—
COLOR–AUTO–GOTO–LIST–RUN–
COLOR 15, 4, 4–CLOAD"–CONT–
LIST–CLS RUN. But they can be very easily reprogrammed to any function you require, up to 16 characters long, in direct mode and from your program.

To the right of the keyboard is the cursor key cluster, and along the top the editing keys and the reset key. The reset key has a raised section all round it to prevent it being pressed accidentally.

There is a full set of characters available from the keyboard, including the Greek alphabet for engineers and mathematicians. Sony have very thoughtfully supplied a sheet of decals so that you can label the front of the keys with any special characters that you may require frequently, therefore leaving the keys relatively uncluttered, as some keys can access up to six different characters. These 'graphic' characters are very easily accessed from the keyboard using the GRAPH and CODE keys in conjunction with the normal QWERTY keys. Sony have also supplied a very useful plastic card, which you can sit on the back of the computer and which shows the relative keyboard positions of all the 'graphic' characters.

Ports plentiful

The computer itself is well supplied with I/O ports. There are 2 joystick ports on the right of the case. According to the MSX standard the joystick ports are both hard wired to accept a joystick wired with two trigger buttons. Although most of the joysticks available on the market at the moment have two trigger buttons they are generally connected together as one. Joysticks with the standard Atari type connector still work well with the Sony computer with no apparent problems. On top of the case there is one of the two MSX cartridge/expansion slots. Along the back is the second cartridge/expansion slot, a 14 pin amphenol socket for the centronics printer interface, an 8 pin din socket for the tape interface. Any datacassette recorder can be used; you don't need a special one, a 6 pin Din socket for composite video and audio output, a Phono socket for RF output to the TV antenna socket. The review machine had a UHF modulator but I understand that all the machines are to be modified to VHF output and there is also a 21 pin socket to connect up to an RBG monitor.

1) **Expansion Port**
2) **Centronics Printer Port**
3) **Cassette Port**
4) **RGB Video Port**
5) **Composite Video and Audio Output**
6) **RF Output, to TV**

Expansion should be no problem as the two cartridge ports can also be used

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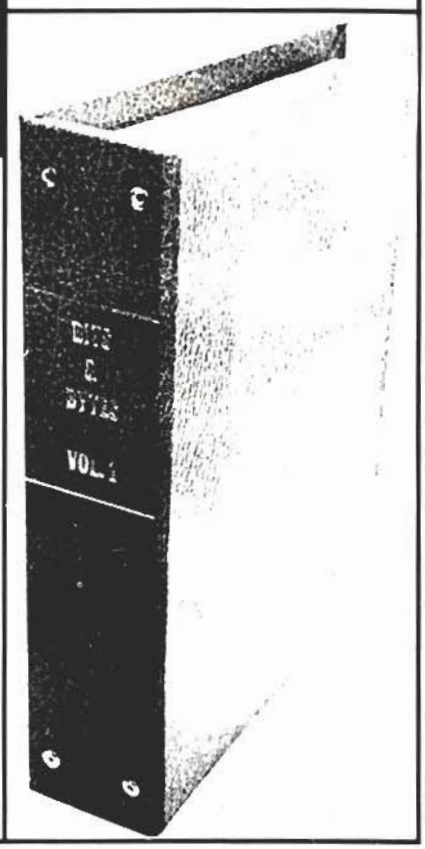

for expansion and as the bus is standard for all of the MSX machines any peripherals for any of the other MSX computers should work on the Sony Hit-Bit, provided the peripherals are built to comply to the MSX standard and are not machine specific. This also means that with the two expansion slots already available you can expand very easily from the start without the need to buy an extra expander unit, unless you want to go really overboard, in which case you can expand up to 16 slots in 4 slot jumps. Sony do not have an expander available at the moment but I understand that other manufacturers do. Sony have produced some peripherals already, such as a four color printer plotter, a wireless joystick and a 3.5 inch disc drive. The disc drive comes with the disc interface, which also contains the Disc Operating System in a Rom. This means that the operating system is available immediately and does not require the preloading of a separate DOS from disc into the user Ram space each time that you want to use the system.

Some other companies, such as Kuma Computing, are already producing peripherals, such as a speech synthesis board and software, an RS 232 board and a parallel I/O board.

Similar system

The MSX Basic and operating system is contained in a 32K Rom. This version of Basic is a very versatile and full version of Microsoft Extended Basic, with over 140 commands, very similar to IBM PC and Spectavideo Basics, with minor variations. This is a very easy Basic to use, and learn, especially for the novice, but also for the more advanced programmer.

Right from the start it is possible to create some very impressive shapes and patterns on the graphic screen using the special graphic commands, such as CIRCLE, LINE and PAINT. There is also a DRAW command which allows you to draw complex patterns on the high resolution screen using strings i.e. DRAW"R10F10D10G10L10H10 U10E10." There are also several other functions within the DRAW function such as Scaling, 90 degree rotate etc.

For the musically inclined there is a similar PLAY command which will allow full musical scores to be set up in strings, with 3 separate tone voices, within which the Octave, Tempo, Length of Notes, Volume, Modulation and Shape of the envelope can be changed at any time with a single character and number. The Hit-Bit has four screen formats:—

- **TEXT MODE** which is the default mode and gives up to 40 * 24 characters in two colors. Each character is 6 * 8 pixels and therefore some of the keyboard characters are slightly truncated on the screen.
- **GRAPHICS 1** which gives 32 by 24 text characters. This is actually a text

(continued)

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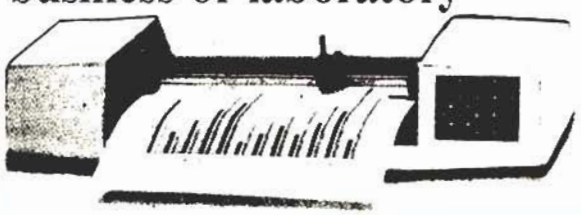

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Extensive software listings for major computer brands are supplied.

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screen as well, but also allows up to 32 sprites and the characters are 8 * 8 pixels which will print all the characters without truncating. It is also easier to read listings etc. in this mode. This is also a two color screen but limited colors can be obtained with some careful VPOKING into the area of 8192 to 8224.

- **GRAPHICS 2** which gives 256 * 192 pixels in 16 colors, with 32 sprites.
- **MULTICOLOR** which gives 64 * 48 color blocks, with sprites.

The video display is controlled by a Texas Instrument TMS 9929A VDP. This chip has 16K of dedicated video Ram and therefore does not use any of the user Ram for the Video display. It also allows up to 32 Sprites on screen at a time on any screen except the text screen. One restriction being that only 4 sprites can appear on any one horizontal line at any time, the fifth sprite being ignored until one of the sprites moves off the line.

The sprites can be set to 2 different sizes, and both sizes can be magnified by a factor of 2. This gives 8*8, 16*16 and 32*32 pixels. The sprites are very easy to control from Basic using the special Sprite commands.

The sound is generated from a General Instrument AY-3-8910 PSG. This chip is very versatile with 3 tone and one noise channel with mixers and envelope shape. Some quite amazing sounds can be produced as explained earlier, using the PLAY command, and also by direct command to the registers using the SOUND command. The SOUND command allows even more variety of noises than the PLAY, such as explosions, phasors, etc. I would recommend that you read the data sheet on the PSG for more information on it's capabilities. The Sony also contains a 16K Rom with 3 application programs.

When the computer is first switched on, or reset, the screen displays a menu of options. These include an Address Book program, a Scheduling program and a Memo Program. All of these programs, and Basic, can be used in conjunction with the data cartridge or the cassette. This is a 4K Ram pack with a battery backup and can store programs or data even when the computer has been switched off and the cartridge removed. The 16K Rom and the data cartridge do not sit in normal memory space but are located in I/O ports, the firmware then transfers information as required.

At the time of writing there was only a limited amount of software available in New Zealand but this promises to change as more of these computers enter the market.

The software that I was loaned with the machine was nearly all on cartridge and was of very high quality. The problem with cartridge software is that current Customs regulations are restrictive and I doubt if most of the cartridges will be on sale here. There is also a reasonable amount of cassette-based software available overseas from most of the English software houses, and the programs that I have seen have been very good, all written in machine code with excellent graphics and high speed movement. I can see the amount of software equalling the amount available for the C64 before long. There are also no Customs problems with the importation of cassette and disc software.

On thing I found annoying was that the computer locks off the cassette drive unless it is loading or saving. This means that to rewind the tape you must either unplug the remote or type motoron and motoroff each time. This appears to be a common problem and could be fixed with a small microswitch or relay inside the datacassette recorder, with the contacts wired across the remote socket. But take care!

Sony also supply two excellent manuals with the computer: the first manual gives all of the Basic commands with the syntax and examples in easy to understand language. The second manual is written in a simple to read and understandable way for the novice computerist to introduce you to Basic in simple steps. The advanced programmer will find the first manual very useful but will probably find the second manual a bit too simplified.

Overall, I think that MSX will be a force to be reckoned with: with 19 manufacturers now making MSX compatable computers it will be a more attractive proposition for the private software houses. Even if some of these computers do go off the market more than sufficient support will be available from other sources.

Although all of the MSX computers have been built to the same software and hardware base standard I think that this machine might just have the edge with its data cartridge, built in application programs, professional style keyboard, printer port and good styling.

MICROCOMPUTER SUMMARY

Name:	Sony Hit-Bit MSX
Manufacturer:	Sony, Japan.
Microprocessor:	Z80A
Clock speed:	3.579MHz
Memory:	32K MSX Basic in ROM + 16K applications program 64K RAM (28815 bytes user RAM for Basic) + 16K Video RAM
Input/Output:	Centronics printer port, 2 joystick ports, 2 MSX cartridge/expansion ports, CRT Composite video and audio, RGB and VHF RF 1200 by 2400 baud cassette interface (FSK format)
Keyboard:	74 keys including 12 control keys, 5 programmable function keys and 8 edit keys.
Display:	text up to 40 x 24 line screen; graphic 256 x 192 pixels; 16 colours, 32 sprites
Languages:	MSX Basic
Sound:	8 octaves, 3 tone and 1 noise channel
Cost:	$895.00
Supplied accessories:	TV monitor cable, cassette interface cable antenna selector switch, 2 manuals.
Reviewer's ratings: (5 highest)	Ease of use 5, expansion 5; support 4 plus, documentation 4 plus, language 5; value for money 5.

(Review unit supplied by South Auckland Computers and Electronics, PO Box 720 Papakura).

Brian Wilson, the reviewer is the chairman of the Spectravideo User group in Auckland and a keen advocate of the advantages of MSX as a standard.

ws Micronews Mic

IBM into schools

IBM NZ Ltd appointed Microprocessor Developments Limited (MDL) as its value-added-dealer for educational products. IBM will supply computers for MDL to build into custom-designed packages to be sold to schools. MDL's contribution will include networking facilities, additional hardware and software.

Jet printer

The IBM Colour Jet Printer launched here last month offers near-letter quality print, all points addressable graphics or text printing in seven colours.

YAMAHA CX5M
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a feature is the MSX SOFTWARE

A package for musicians and composers

By M. Langdon

Yamaha CX5M MSX Music Computer.

The CX5M is sold as a package deal, i.e. complete with a 49 key music keyboard (YK10) and 3 dedicated software cartridges (YRM101 FM Music Composer, YRM 102 FM Voicing Program and YRM104 Music Macro Program).

Although the CX5M is a true MSX computer, it is being marketed as a music computer/synthesizer that is MSX compatible. And as such, Yamaha appear to be supplying only dedicated music software, thereby relying on other MSX manufacturers' software for other applications.

On opening the boxes, I was confronted with a very business-like, professional looking micro, a slim-line music keyboard, and a rather large external power supply. All three were colour matched in what I would describe as charcoal, with white lettering.

A visual examination of the micro revealed an incredible number of ports. There is a cartridge slot on top; 2 joystick ports on the righthand edge; a parallel port, MSX printer port, sound and video ports, RF port, and power supply plug on the back edge; a music keyboard port, MIDI in and out ports, and stereo audio ports on the left hand edge.

The music keyboard and MIDI port are dedicated Yamaha ports. One example of the latter, Music Instrument Digitial Interface, is the ability to interconnect up to 16 synthesizers in a master/slave arrangement. Each of the slaves can be set independently to any voice, and all be played from the master keyboard to create astonishing sound.

The micro's keyboard, as per MSX specifications, is the usual QWERTY layout, plus 5 shiftable function keys, cursor pad, and 5 edit/program keys, the latter being used extensively with the dedicated software. The keys, both on the micro and YK10, had a firm feel, without being overly stiff or springy. The micro's keyboard was angled forward, typewriter fashion, with an enlarged, reverse "L" Enter key for the not so nimble-fingered typists like me.

Cable Jumble

It took a little while to sort out the jumble of cables to/from the CX5M, i.e. power supply, cassette, RF, YK10, but finally I was able to power it up and was instantly confronted by an MSX logo before dropping into Basic. This version is very complete with the usual graphic/sound additions, and is explained excellently in the MSX Basic manual supplied. There really is nothing left to say about MSX Basic that has not already been said: virtually all MSX machines are the same, 64 K ram, 32K rom, etc. What sets one micro apart from the rest are its options. In the case of the CX5M it is the synthesizer keyboard and associated software.

The synthesizer is the heart of the CX5M. As it is a music synthesizer first, MSX computer second, Yamaha has written some incredible dedicated software for musicians/composers, be it novice or experience. But, as this machine alone has the necessary hardware (ie. YM2149 sound generator), this software can only be used with the CX5M.

The Music Composer is a sophisticated, easy to use, composition and arrangement package. It features an on-screen music staff, direct micro/music keyboard note inputting, control over time signature, key signature, tempo, etc. Compositions can be saved to cassette to be loaded back at a later date or used to drive MIDI compatible synthesizers, drum machines, etc., via the MIDI port.

The FM Voicing Program gives exact control over the sound generator parameters such as amplitude, pitch keyboard scaling or waveform. Using this virtually any sound can be produced, or duplicated. These too can be saved or loaded to a cassette tape.

The Music Macro, (my favourite) adds extra commands to MSX basic, permitting control of the sound generator from within Basic programs. This makes it possible to write programs incorporating music or special sound effects not normally achieveable using the standard MSX sound commands.

The manuals supplied with the micro, and the software, were to say the least, comprehensive. All were well written with plenty of examples and diagrams. In particular the Basic manual contained 355 pages of information, of which over 250 pages had uses, examples, formats, of the MSX Basic.

Conclusion

The CX5M/YK10 package has everything an MSX machine has to offer — user friendly Basic, good graphics, 16 colours; — with the added bonus of a built-in synthesizer/keyboard, if you can afford the price. For those wanting both a micro and a synthesizer, the Yamaha is the one to get.

MICROCOMPUTER SUMMARY

Name:	Yamaha CX5M Music Computer
Microprocessor:	Z80A
Clock Speed:	3.579 MHx
Ram:	32K
USERAM:	28K
ROM:	32K
Input/Output:	MSX cartridge, parallel port, printer port, sound, video, RF ports, music keyboard port, MIDI in and out, Left and Right audio, and 2 joystick ports.
Keyboard:	Typewriter style, 73 keys; also piano style, 49 keys.
Display:	40 x 24, upper and lower case.
Languages:	MSX Basic.
Graphics:	256 x 192 pixels, 16 colours.
Sound:	8 oct. 8 note YM2149 (MSX compatible).
Cost:	$1995 including YK10 and software package.
Options:	Dx7 Voicing Program $79.00. Technical manual.
Peripherals:	Digital drum machines, sequencers, tone generators (prices on application).

Reviewer's rating (5 the highest): Documentation — 4; Ease of Use — 3; Language — 4; Expansion — 4; Value for money — 3; Support — 2.

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MSX — what is it?

by Alex Bridger

What is this new star, planet or comet on the computer horizon called MSX? Those who went to the Wellington Computer Show might think it was yet another Spectravideo model. No it isn't, although it is true that the new SV728 was the only MSX machine on show until someone borrowed a Mitsubishi to demonstrate the concept of complete software interchangeability between different machines.

MSX is a standard way of making a microcomputer. The hardware heart of this system is the 8 bit Zilog Z80A central processing chip(CPU). The other key chips are the Texas Instrument TMS 9918A Video Display Processor (VDP), the General Instruments AY-3-8910 Programmable Sound Generator and the 8255 Programmable Peripheral Interface (PPI).

The software (firmware) heart of the system is the 32k ROM MSX Basic created by Microsoft. This advanced or super extended form of Basic is a superset of Basica or of SV328/318 Extended Basic although the differences to this latter are very small.

MSX Basic is a custom tailored version of GWBasic (Gee Whiz) that has a Basic Input Output system (BIOS) with publicly available entry points. This allows software programmers to develop software more easily. The memory expansion slots and cartridge slots also form an important part of the MSX standard, which theoretically are all identical however this is not quite the case with all cartridge slots.

Why fuss?

You may wonder why then all the fuss over an 8-bit system based on a chip that is already aging. The key to this lies with the 17 huge electronics companies that have bought MSX licences from Microsoft and will be producing MSX machines very cheaply for the home market. This may be likened to Ford's mass production of the spartan Model T during the 20's which nearly everyone could afford. Prices of micros however may not tumble sufficiently until all the key chips can be put onto one 'large' chip, using dense VLSI technology, this may not be far away. Also, one cannot help feeling an extension to the 8-bit machine lifecycle is occuring due to what I call the 'commercialisation' problems of new technology; e.g. Zilog has admitted there are bugs in its Z80000 chip which will not now be released until 1986 and Intel has admitted a small bug associated with its 80286 chip in its multiprocessing facilities (true; seldom used). This is the chip used in the IBM PC AT (June 85 Byte).

The large MSX companies are 13 Japanese companies: Canon, Fujitsu, General, Hitachi, Kyocera, Mitsubishi, Matsushsita better known as National or Panasonic, Pioneer, Sanyo, Sony, Toshiba, Victor or JVC and Yamaha, three Korean companies Daewoo, Goldstar and Samsung, Phillips from Europe, and the American/Hong Kong company Spectravideo or SVI.

From what I have read, Spectravideo played a unique role in the development of the MSX standard and this comparatively small company was the catalyst which spurred Microsoft's and ASCII (a Japanese publishing & software company) to develop the standard. It is my suspicion that Spectavideo did really have the first MSX standard (as initial advertising indicated) but possibly backed away for competitive fear of being swamped by the giants that wholeheartedly adopted what became a slightly modified Spectavideo/Microsoft standard (licensing fees may also have been a reason). Apart from hardware price considerations the success or failure of the MSX machines will, as with many other computers, depend on the availability, price, variety, and choice of software and peripherals. Judging from the only MSX machine I have had contact with — the Spectravideo SV 728 — it appears that the standard is aimed clearly at the home market only, where wordprocessing, entertainment, education, small database files and control of home appliances are the common uses for the microcomputer.

Fizzle or flourish?

For any of these uses an 8-bit, 84k machine would in most cases be quite adequate. One reservation I have is that the MSX standard does not have multitasking capability (two programs running independantly almost at the same time) like the SV328 which I think will be important for controlling home appliances and other devices just starting to come out of the R&D departments.

Product differentiation in terms of non-interchangeable peripherals is how the electronic giants will compete. Yamaha has produced a music synthesizer for its machine. General Corporation, very good at making quality TV's, will sell televisions with a built in MSX computer. Add to this a modem and you have teletext, telebanking and electronic mail facilities. Pioneer will have a video interface which will allow mixing computer graphics with video film scenes on the same screen, this has application for easier entertainment programming or cheaper advertising filming. Sony have a 4K Personal Data Bank cartridge using CMOS RAM, supported by a 5 year battery. This is semi-permanent Read/Write storage instantly available as soon as you switch on.

Finally, on the question that is asked whether MSX will grow and multiply like the Sony radios and cassettes (not to mention other popular Japanese appliances) or will it fizzle like the home video craze. I think two crucial matters will determine the answer to this question, both inevitably relate to software. Firstly software must be cheap to discourage piracy which in turn discourages development of the best software thus creating a downward spiral. Secondly, what is Microsoft/ASCII planning to upgrade MSX with in terms of the 16 or 32 bit chips? If they decide on downward compatibility with the existing standard then I think MSX will last a long time. Will Microsoft build the new standard around the Zilog 8000 or 80000 X80 compatible chips or the more versatile Motorola 68000 chip which may cost more in terms of hardware to achieve downwards compatibility.

SVI 608 MSX

by Barbara Bridger

This is an attachment for converting a SV328/318 into a 16K games machine. It has a tiny keyboard with small calculator type keys, a cartridge slot, a port to allow attachment of a cassette tape recorder, and 2 ports for joysticks. It is connected by way of the expansion slot at the back of the SV328/318.

The keypad has 40 keys arranged in 5 rows of 8 keys:- 26 alphabetic keys, 10 numeric keys, 4 cursor control keys, comma/quotation and period. There are also 6 function keys shift, control, stop, enter/return, space, and select. Missing are insert, delete, cls, =/+,left graph, right graph, escape and backspace keys. Although the programmable function keys are also missing the screen still comes up with a standard MSX display including the function key display when there is no cartridge in the slot.

It is possible to laboriously type in a MSX program and run it by using the standard Microsoft edit keys, eg CTRL R for insert, and using the ASCII code together with the CHR$ function to get the missing symbols, eg PRINT CHR$(61) gives an = but for practical purposes this adapter is really only for software that runs on a 16K machine or is available as a ROM cartridge. I have seen some excellent MSX ROM cartridge games so this adapter should give access to a wider range of software.

MSX or SVI joysticks can be used with the adapter but the second fire button available on most MSX joysticks may not be supported. The adapter would not work with our early model of SV328 but was all right on other early models. Many thanks to Kevin Rowell of Microstyle Computers, Lower Hutt for helping us out with a machine.

At the time of writing this adapter had not been released onto the retail market but it will probably cost around $300 when it becomes available.

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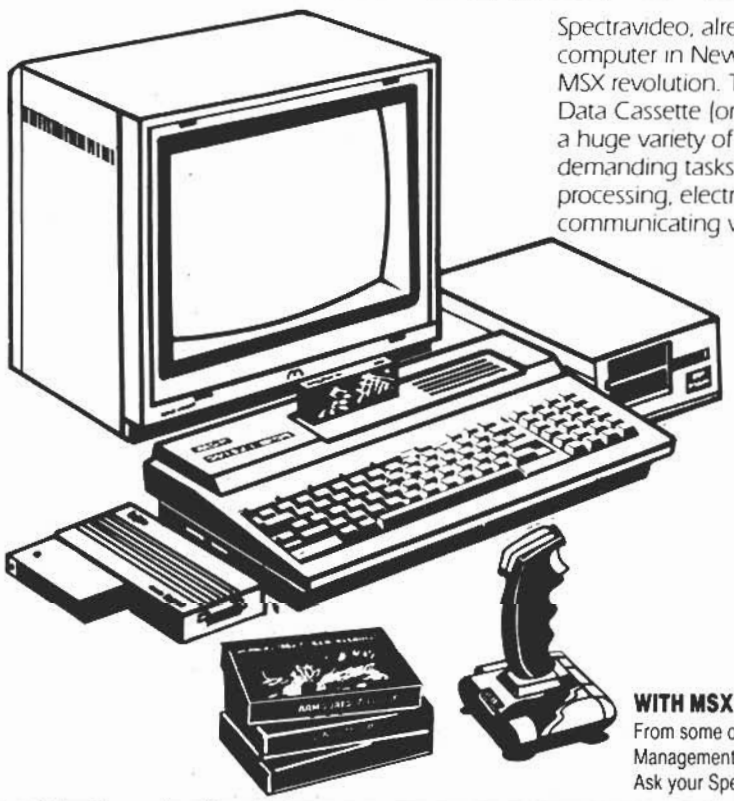

Spectravideo, already ranked the best price-for-performance personal computer in New Zealand, was also the computer that inspired the MSX revolution. Totally expandable, plug it into your TV and the SVI Data Cassette (or any standard cassette player) and you're ready to run a huge variety of MSX software. It's capable of performing the most demanding tasks with professional ease and results, including word processing, electronic home banking and budgets, plus communicating with other computers.

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Some MS-DOS functions

by Noel Weeks

SWITCH POSITIONS FOR MONOCHROME SCREEN:

Switch	Status	Function
1	ON	Monochrome mixed mode. Three levels of green for graphic programs.
2	OFF	Half intensity
3	OFF	Blink
4	OFF	Not used.

NORMAL SETTING FOR COLOUR (As supplied from the factory) is as follows:
1 — OFF
2 — ON
3 — ON
4 — OFF

Welcome to the second column of looking into the Sanyo Computer. This month we will be covering a few of the basic functions available at MS-DOS system level, and general information that will be required for future reference.

One of the first things that needs to be done is to ensure that the screen handling Dip Switch is set to the correct position for the screen being used. From the factory, the Sanyo is shipped with the Dip Switch set for colour. Unfortunately, this can be an annoyance if you are going to be running a monochrome screen.

The Dip Switch is found at the rear of the main memory board which means you're going to have to take the back off the computer. You will find this switch at the back left hand corner.

The switches should be set to correspond with the table:

By setting the switches for the monochrome mode, you will find that the incessant blinking of certain colours will now cease to exist. I trust that the above will ease the eyestrain from which some Sanyo users have been suffering!

Since PC-DOS is almost identical to MS-DOS, you will find that a lot of IBM Public Domain software will run on the Sanyo. Occasionally, though, you will find a certain difficulty in getting the program to run on the Sanyo. Sometimes this can be attributed to the difference between the IBM keyboard and the Sanyo's keyboard. When you reach this problem, try using the following table:
NOTE: * These symbols are found on the first "double width" key to the lower left of the Return key on the Sanyo keyboard, at 11 o'clock to the right hand Shift key.

Another nice feature on the Sanyo keyboard is what is known as the "DOS editing keys". These functions are what the PF keys are set to on boot. One

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should note that they are slightly different for each version of DOS. The keys are a boon to novice typists like myself. With a little thought you can make their features indispensable in the operation of entering commands to the system. The following two tables refer to each MS-DOS 1.25 and 2.11, and possibly 2.6 which has been released with the 55T model:

MS-DOS VERSION 1.25

PF1

Copies one character from the previously entered command e.g. If the last time you entered a command it was CHKDSK, then for each time you press PF1, you will copy the letter that was in that position before ie. if you push PF1 once, you will see a C, if you push it again you will see an H and so on.

PF2

This key is pressed and then immediately followed with a letter which results in the editor copying the previous command line up to that letter, eg. assume the previous command was COPY FILEA.TXT+FILEB. TXT+FILEC NEWNAME. TXT (which copies FILEA. TXT and FILEB. TXT and FILEC. TXT to the file called "NEWNAME.TXT" — in other words the above command simply copies three files to one new file). However, have you noticed that in the command line we forgot to put .TXT after FILE C?

Therefore, to correct it without retyping the whole line, we would press PF2, followed by a "C" which would cause the editor to copy the previous line UP TO the "C". We would then of course enter .TXT and the rest of the text which followed in the original command line.

PF3

PF3 copies the previously entered command line from the present position of the cursor onto the new line. In other words, if the previous command was DIR B:*.TXT, and in actual fact you now know that you want to delete all the TXT files on the "B" drive, you would simply enter "DEL" then push your PF3 key, which will copy the remaining characters from the previous command line ending up with the following on the screen: DEL B:*.TXT.

Another good example is to enter CHKDSK and return. When CHKDSK has finished, push PF3 and you will see "CHKDSK" appear on the screen, and then type B: (or whichever drive you are not logged onto) and the machine will then CHKDSK that drive.

PF4

PF4 ignores the previously entered characters up to the next typed character of the previous command line. eg. if the previous command was A:CHKDSK and you realised that it wasn't on the A:Drive, then simply press PF4, followed by a "C" and then PF3, and see on the screen CHKDSK, after which you simply return.

PF5

Initialises the template.

PF6

This key will kill the new template but will not change the old one.

PF7

Turns the insert mode ON. A good example of this would be assuming that the previously entered command was that shown in PF2 above, then we should enter:

PF2 C then push PF7 and type .TXT and push PF3 and Return. This will result in the command line being copied up to the "C", we would insert .TXT and PF3 would copy the remainder of the original line to the screen.

PF8

This function key simply turns the insert mode OFF.

PF9 and PF10

Not used in MS-DOS 1.25

NUMERICAL KEY 6

Is used to ignore one character in the previously entered command line, in other words it's similar to PF4, except it only moves one character at a time.

NUMERICAL KEY 4

Moves one character to the left and deletes as it moves.

MS-DOS 2.11 KEYS

PF1 to PF4 Are the same as for MS-DOS 1.25

PF5 Replaces the old template with the new line thus making the new line the new template

PF6 Produces a control-Z (1Ah) on the screen (Z is the symbol

PF7 used to designate end of file.

PF8 Not used in this DOS version

PF9 Turns the insert mode ON

PF10 Turns insert mode OFF Cancels the current input and leaves the original command line unchanged.

NUMERICAL KEYS 6 & 4 are the same as described above for MS-DOS 1.25

A point worth noting about the above keys is that you will generally find they work within some of MS-DOS' external files such as EDLIN. This is extremely convenient because, with the inherent weaknesses of Edlin, we eventually get to a stage where Edlin is not such a "pain in the neck" to deal with! I generally use Wordstar in the non-document mode instead of Edlin.

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A utility to find stored data

by Dick Williams

This third article on the Sega disc drive is about finding data saved on the disc by using a utility program to read the directory sectors to find the start and, from the file allocation table, the subsequent disc positions.

There are not a lot of times that you will need to examine the contents of a disc but some of you may be curious and want to know how to, and there is always the possibility of a glitch in the disc system preventing the disc controller from reading a file which is still showing in the directory. The files command shows all programs and files currently on the disc. Each line shown on the screen gives the name and nature of the information, i.e. a program or a data file, by the presence or the absence of a full stop at the eight position. Each line is 16 characters long and contains a pointer which, when deciphered, tells us the data start position.

The pointer contained in the directory line shows the first data position in the file allocation table (FAT). Program 2 will read your disc and print the FAT. This program is for demonstration only and is not used in program 1. The starting position for data on the disc may be found by looking closely at the directory track which gives the starting cluster number. Chapter 6 of the disc manual gives particulars. The 12th character (starting from 0) gives the starting cluster number. The utility program shown below prints each directory listing on screen showing firstly a hex dump of all 16 positions on the line and below it an ASCII conversion so you know it's the line of interest. There are 16 directory listings in a sector and all 16 are displayed together with the starting cluster number in hex and decimal. You can then choose which of the 16 listings you want to examine and the program will display all clusters used for that particular program or data file. Some use just one cluster while longer programs or data files may show up to ten clusters or more.

Suppose you run the program and get the result that the program you want to examine on disk has two clusters say 46 and 47. Since there are two cluster numbers we know that there are at least five sectors used, four for the first cluster number and between one and four for the last cluster. Now we have to do a little arithmetic to work out exactly where on the disc the data is stored. Take the first cluster number and divide it by 4. This gives (46/4) = 11 with 2 left over. 11 is the track number we want and the sector is (left over * 4 + 1) = 9. Therefore, we can write down the starting position on the disc as track 11 sector 9 and we also know that sectors 10, 11 and 12 are involved as well. The next cluster number is 47 so, doing the same as we did to the first cluster, divide 47 by 4 = 11 with 3 left over. Left over times 4 plus 1 = 13 this gives track 11 sector 13. In this particular example I have shown two consecutive cluster numbers, 46 and 47. However, it does not follow that all cluster numbers will be in order as the disc manager puts data firstly in order but if it runs out of room can put data in any spare places all over the disc. It is quite normal to get cluster numbers such as 54, 55, 63, 71, 89, 100, 103 etc.

When you start using this utility there are a couple of things to watch out for. First, all data files are stored on the disc in ASCII format, which means they are in normal English and present no problem in reading them directly. All programs on the other hand are stored in token form so that some words are replaced by unreadable tokens. To read such a program directly would require a program to expand the tokens to full text. It is more usual to want to read a data file in case of a problem and, as mentioned, these are readable.

You should always take a copy of your disc especially if you intend doing a correction by overwriting disc data. This utility program is a little more complex than usual because I have converted the usual Hex information into decimal for the benefit of new disc users. If anybody wants a copy of this program please send a Sega disc together with $1 to cover costs to me at Box 143 Pukekohe. The best method of sending discs through the post is to use the bubble packs and don't forget to include your return address.

The Sega has two useful routines to turn Hex into decimal and decimal into Hex. These are as follows:
Dec to Hex range -32768 to +32767 print Hex$(dec num) Hex to Dec range 0000 to FFFF print &H Hex Num. Brackets not required for Hex to Dec.

```
1 REM THIS PROGRAM READS ANY DIRECTORY
      SECTOR AND WORKS OUT THE CLUSTER
      SEQUENCE FOR DATA OR PROGRAMS.
2 REM HAVING OBTAINED THE CLUSTER SEQ-
      UENCE,WORK OUT THE TRACK AND SEC
      TORS AND USE ITEM 13 ON THE MAIN
      MENU TO INPUT YOUR OWN TRACK AND
      SECTORS TO READ THE DISC.
3 REM USE THE LAST SECTION TO FIND THE
      CLUSTER NUMBERS ONLY. READ THE
      ON SCREEN INSTRUCTIONS.
      ONE TRACK/SECTOR COMBINATION IS
      256 BYTES ARRANGED IN 16 BYTE x
      16 (0-F) ROW FORMAT.
```

(continued)

fulltext 55/80

WORD PROCESSOR
MAIL MERGE/SORT
SPELLING CHECKER (optional)
ASSEMBLER (6502/65C02)

apple II+ IIe IIc

- Announcing.... FULLTEXT 55/80 version 4. Now even easier to use, even more powerful.
- New! The Fulltext integrated Spelling Checker with 45000 word New Zealand dictionary. Add up to 7000 of your own.
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- Requires 64K memory. DOS based.
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- Advanced formatting options: page numbering, page headings, indentation, justification, definitions auto-indents/auto-numbering of (sub-) sections and (sub-) paragraphs [1. 2. 3. etc or a) b) c) etc].
- Comprehensive 165-page manual with full descriptions. Disk includes SELF-TEACH file for fast learning.
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Fulltext 55/80 .....$125
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```
4 REM ------set up menu--------------
5 CLS:PRINT "DIRECTORY:- TRACK 20,SECT
ORS 1-12":PRINT
6 FOR P=1 TO 12:PRINT"  ";P;TAB(5);"SE
CTOR
7 NEXT
10 PRINT"   INPUT YOUR OWN TRACK AND S
ECTORS ":PRINT:PRINT"SELECT OPTION +CR
":H=2:FOR P=1 TO 100:NEXT
19 REM ---menu pointer---------------
20 CURSOR0,H:PRINT"->":CURSOR0,H:Y$=IN
KEY$
30 IFY$=CHR$(30)THENCURSOR0,H:PRINT"
":H=H-1:IF H<2 THEN H=2
40 IFY$=CHR$(31)THENCURSOR0,H:PRINT"
":H=H+1:IFH>14 THEN H=14
50 IFY$=CHR$(13)THENBEEP:CURSOR0,14:GO
TO 70
60 GOTO 20
69 REM ---menu action----------------
70 PRINT:PRINT
80 IF H<>14THEN TR=20:SC=H-1:GOTO 270
90 FORP=1TO100:NEXT:SM=1
100 PRINT:PRINT
150 INPUT "TRACK NUMBER  +CR ";TR
170 IF TR<0 OR TR>39 THEN 150
190 INPUT "sector number +CR ";SC:PRIN
T
200 IF SC<1 OR SC>16 THEN 190
270 PRINT"TRACK ";TR;"    SECTOR ";SC
276 REM ---read disc-----------------
278 DSKI$ TR,SC;A$,0,128;B$,128,128
280 REM ---process A$----------------
281 X=0:DIMD$(40):D$="":DIMR$(40):R$="
":Y=0:GOSUB 300
282 REM ---process B$----------------
283 A$=B$:Y=8:GOSUB 300
284 REM ---print starting cluster----
285 CLS:PRINT "   0123456789ABCDEF  HE
X   DEC":FOR P=0 TO 15
286 R$=R$(P):GOSUB 6000
287 PRINT HEX$(P);"  ";D$(P);:IFSM=1 T
HEN PRINT:GOTO 289
288 PRINT"  ";R$(P);"   ";R-1
289 NEXT:GOTO 800
298 REM ---routine to process disc---
299 REM ---top row,hex data----------
300 FOR P=0 TO 7:JJ=0
310 PRINT
340 FOR Q=0 TO 15
350 C$=MID$(A$,P*16+Q+1,1)
355 IFQ=0THENPRINTHEX$(X);" ";:X=X+1
360 N$=RIGHT$("0"+HEX$(ASC(C$)),2)
361 PRINT N$;:IFN$="01"THENJJ=1
365 IF Q=11 THEN PRINT " ";
366 IF Q=12 THEN PRINT " ";
367 IF Q=12 THEN R$(P+Y)=R$(P+Y)+N$
370 NEXT Q:PRINT
380 REM --bottom row, ASCII data-----
390 FOR Q=0 TO 15
400 C$=MID$(A$,P*16+Q+1,1)
405 IFQ=0THENPRINT"  ";
406 IF ASC(C$)=&H2E ANDJJ=1THENC$=" ":
GOTO 420
410 IF ASC(C$)<&H20 THEN C$="."
420 PRINTC$;" ";:D$(P+Y)=D$(P+Y)+C$
425 IFQ=11THENPRINT " ";
426 IFQ=12THENPRINT " ";
440 NEXT Q:PRINT
450 NEXT P:RETURN
455 REM --read File Allocation Table-
800 CURSOR0,18:PRINT"PLEASE WAIT
805 IF SM=1THEN CURSOR 0,18:PRINT"PROG
RAM STOPPED":PRINT"RUN AGAIN WITH NEXT
 TRACK&SECTOR INFO":STOP
810 DSKI$ 20,13;A$,0,160:DIM B$(160)
850 FORP=&H00  TO &H9F
860 J$=MID$(A$,P,1)
870 N$=RIGHT$("0"+HEX$(ASC(J$)),2)
890 B$(P)=N$
900 NEXT
950 CURSOR0,18:PRINT CHR$(5):BEEP
960 CURSOR0,18:PRINT "MOVE > UP/DOWN +
CR
999 REM ---menu pointer--------------
1000 H=1:FOR P=1 TO 100:NEXT
1010 CURSOR2,H:PRINT">":CURSOR2,H:Y$=I
NKEY$
1020 IFY$=CHR$(30)THENCURSOR2,H:PRINT"
 ":H=H-1:IFH<1THENH=1
1030 IFY$=CHR$(31)THENCURSOR2,H:PRINT"
 ":H=H+1:IFH>16THENH=16
1040 IFY$=CHR$(13)THENBEEP:CURSOR2,H:P
RINT"-":CURSOR0,18:PRINTCHR$(5):GOTO 2
000
1050 GOTO 1010
1055 REM --print clusters in decimal-
2000 CURSOR0,18:R$=R$(H-1):GOSUB6000
2040 PRINT R-1;
3000 IF R$(H-1)="00"THEN 4070
3050 GOSUB 6000
3060 LL=R
4000 IFB$(R)="C1"THEN4060
4010 IFB$(R)="C2"THEN4060
4020 IFB$(R)="C3"THEN4060
4030 IFB$(R)="C4"THEN4060
4040 R$=B$(R):GOSUB 6000:R=R-1
4043 PRINT R;
4050 R$=B$(LL):GOTO 3050
4060 REM --time to read fat info.----
4070 PRINT:INPUT"PRESS CR ";K$
5000 CURSOR0,18:FOR P=1 TO 3:PRINTCHR$
(5):NEXT :GOTO 1000
5999 REM ----------------------------
6000 REM --string hex to decimal-----
6010 RL$=LEFT$(R$,1):RL=VAL(RL$)*16
6020 RR$=RIGHT$(R$,1)
6030 IF RR$="A"THENRR=10:GOTO 7000
6040 IF RR$="B"THENRR=11:GOTO 7000
6050 IF RR$="C"THENRR=12:GOTO 7000
6060 IF RR$="D"THENRR=13:GOTO 7000
6070 IF RR$="E"THENRR=14:GOTO 7000
6080 IF RR$="F"THENRR=15:GOTO 7000
6090 IFASC(RR$)>47 AND ASC(RR$)<58 THE
NRR=VAL(RR$)
7000 R=(RL+RR)+1
7020 RETURN
5 REM PROGRAM 2. TO SHOW ON SCREEN 2,2
      THE FILE ALLOCATION TABLE WHICH,
      WHEN GIVEN THE STARTING CLUSTER,
      WILL SHOW THE SUBSEQUENT CLUSTER
      NUMBERS. SEQUENCE ENDS WITH
      C1 C2 C3 OR C4.
6 REM SIGNIFICANCE OF C1-C4 IS NUMBER
      OF SECTORS IN LAST CLUSTER.
      C(1)=1,C(2)=2,C(3)=3,C(4)=4.
7 REM WHEN FE STOPS BLACK IS FIRST
      CLUSTER OF A DATA FILE OR PROG-
      GRAM,BLUE IS NEXT AND POINTS TO
      NEXT BLACK ETC UNTIL BLUE=C1-C4.

8 REM --READ DISC FAT TRACK----------
10 DSKI$ 20,13;A$,0,160:DIM B$(160)
15 REM --PRINT HEX 0-A0--------------
20 SCREEN 2,2:COLOR1,15,,1:CLS
25 CURSOR8,0:PRINT"FILE ALLOCATION TAB
LE FOR THIS DISC (HEX)
30 CURSOR0,8:X=0:FORP=0 TO 6
40 FOR Q=0 TO 22
50 PRINT TAB(P*6+0);HEX$(X):X=X+1
60 NEXT Q:CURSORP*6+0,8:NEXT P
70 REM --PRINT FILE TABLE------------
80 COLOR4:CURSOR0,8:X=0:FOR P=0 TO 6
90 FOR Q=0 TO 22
100 X=X+1:C$=MID$(A$,X,1)
110 IF X=161THEN 150
120 N$=RIGHT$("0"+HEX$(ASC(C$)),2)
130 PRINTTAB(P*6+2);N$:B$(X-1)=N$
140 NEXT Q:CURSORP*6+2,8:NEXT P
150 GOTO 150
```



```
260 IF X$ = "" THEN GOTO 290
270 NTEAMS = NTEAMS + 1: T$
   (NTEAMS) = X$
280 GOTO 250
290 IF NTEAMS/2 <> INT(NTEAMS/2)
   THEN NTEAMS = NTEAMS + 1:
   T$(NTEAMS) = "**BYE**"
300 GOSUB 340: REM all input, so do
   the actual draw.
310 NEXT SECTN
320 NEXT GRADE
330 GOTO 20: REM is another draw
   required?
340 LPRINT "--------------------"
350 LPRINT
360 LPRINT" Grade ";GD$(GRADE);
"Section";SECTN
370 FOR RO = 1 TO NTEAMS — 1
380 LPRINT: LPRINT "Round"; RO
390 GOSUB 470
400 TEMP$ = T$(NTEAMS)
410 FOR I = NTEAMS TO 2 STEP -1
420 T$(I) = T$(I-1)
430 NEXT
440 T$(2) = TEMP$
450 NEXT RO
460 RETURN
470 LPRINT T$(1), T$(2)
480 IF NTEAMS = 2 THEN RETURN
490 FOR I = NTEAMS TO (NTEAMS/2
   + 2) STEP -1
500 LPRINT T$(I), T$(NTEAMS + 3 - I)
510 NEXT
520 LPRINT
530 RETURN
540 X$="": LINEINPUT X$: RETURN:
   REM see text for this unusual
   construction.
550 CLS: END REM exit — put any
   tidying up here.
```

Netball draw

Grade A Section 1

Round 1	
Algol	Basic
Dbase	Cobol
Round 2	
Algol	Dbase
Cobol	Basic
Round 3	
Algol	Cobol
Basic	Dbase

Grade B Section 1

Round 1	
Focal	C
BYE	Modula 2
Round 2	
Focal	**BYE**
Modula 2	C
Round 3	
Focal	Modula 2
C	**BYE**

SANYO MBC-550
Star Blazer
By Richard Pierre

You must travel through the solar system, attempting to reach planet Earth. Your ship has a warp drive which allows you to jump through hyperspace to each planet in turn. You begin the game with 400 units of fuel, which must be used sparingly if you are to reach Earth.

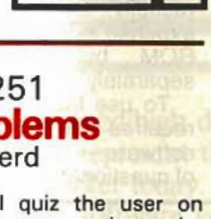
However, using too little fuel during a hyperspace jump can get you stranded, so you'll need the skills of an expert space pilot to complete the game.

```
1 LET F=0
5 COLOR 7
10 CLS
20 FOR I=1 TO 200
30 LET X=INT (RND(2)*639)
40 LET Y=INT (RND(0)*399)
50 LOCATE X,Y,0:PRINT "."
60 NEXT
70 CIRCLE(304,115),80,0,1,.5,6
80 PAINT(304,115),6,6
90 LINE(100,50)-(500,175),7
95 FOR C=1 TO 6
100 SYMBOL(10,5),"STAR BLAZER",6,6,C
110 SYMBOL(140,50),"   BY RICHARD PIERRE",1,1,C
115 SYMBOL(175,180),"   PRESS ANY KEY",1,1,C
120 IF INKEY$="" THEN GOTO 200
125 NEXT
130 GOTO 95
200 REM
210 CLS
220 GOSUB 8000
225 COLOR 4
230 LOCATE 10,5:PRINT "I WARP TO NEPTUNE":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
240 IF U>F AND U<40 THEN GOTO 250
242 IF U>F AND U<40 THEN GOTO 9000
244 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 230
246 REM
248 CLS
250 GOSUB 8000
260 CIRCLE(304,115),70,0,1,.5,5
270 PAINT(304,115),5,5
280 COLOR 4
290 LOCATE 5,5:PRINT "NEPTUNE"
295 LET F=F-U
300 FOR G=1 TO 5000:NEXT
305 IF F<0 THEN GOTO 9000
306 REM
307 REM
310 CLS
320 GOSUB 8000
330 COLOR 4
340 LOCATE 10,5:PRINT "I WARP TO URANUS":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL Y
OU USE ";:INPUT U
341 IF U>F AND U<40 THEN GOTO 350
342 IF U>F AND U<40 THEN GOTO 9000
344 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 330
346 REM
347 CLS
348 GOSUB 8000
350 CIRCLE(304,115),70,0,1,.5,2
355 PAINT(304,115),2,2
360 COLOR 4
365 LOCATE 5,5:PRINT "URANUS"
370 LET F=F-U
375 FOR G=1 TO 5000:NEXT
380 IF F<0 THEN GOTO 9000
385 REM
390 CLS
395 GOSUB 8000
400 COLOR 4
405 LOCATE 10,5:PRINT "I WARP TO SATURN":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
410 IF U>F AND U<40 THEN GOTO 420
412 IF U>F AND U<40 THEN GOTO 9000
414 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 400
416 REM
417 CLS
418 GOSUB 8000
420 CIRCLE(304,115),70,0,1,.5,4
425 PAINT(304,115),4,4
430 LINE(304,50)-(304,175),7
435 COLOR 4
440 LOCATE 5,5:PRINT "SATURN"
445 LET F=F-U
450 FOR G=1 TO 5000:NEXT
455 IF F<0 THEN GOTO 9000
460 REM
465 CLS
470 GOSUB 8000
475 COLOR 4
480 LOCATE 10,5:PRINT "I WARP TO JUPITER":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
485 IF U>F AND U<40 THEN GOTO 490
490 IF U>F AND U<40 THEN GOTO 9000
495 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 475
500 REM
505 CLS
510 GOSUB 8000
515 CIRCLE(304,115),70,0,1,.5,4
520 PAINT(304,115),4,4
525 CIRCLE(304,115),50,0,1,.5,4
530 PAINT(304,115),4,4
535 COLOR 4
540 LOCATE 5,5:PRINT "JUPITER"
545 LET F=F-U
550 FOR G=1 TO 5000:NEXT
555 IF F<0 THEN GOTO 9000
560 REM
565 CLS
570 GOSUB 8000
575 COLOR 4
580 LOCATE 10,5:PRINT "I WARP TO EARTH":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL YO
U USE ";:INPUT U
585 IF U>F AND U<40 THEN GOTO 590
590 IF U>F AND U<40 THEN GOTO 9000
595 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 575
600 REM
605 CLS
610 GOSUB 8000
615 CIRCLE(304,115),70,0,1,.5,4
620 PAINT(304,115),4,4
625 COLOR 4
630 LOCATE 5,5:PRINT "EARTH"
635 FOR G=1 TO 5000:NEXT
640 IF F<0 THEN GOTO 9000
645 REM
650 CLS
655 GOSUB 8000
660 COLOR 4
665 LOCATE 10,5:PRINT "I WARP TO MARS":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL YOU
 USE ";:INPUT U
670 IF U>F AND U<40 THEN GOTO 680
675 IF U>F AND U<40 THEN GOTO 9000
680 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 625
685 REM
690 CLS
695 GOSUB 8000
700 CIRCLE(304,115),70,0,1,.5,6
705 PAINT(304,115),6,6
710 COLOR 4
715 LOCATE 5,5:PRINT "MARS"
720 FOR G=1 TO 5000:NEXT
725 IF F<0 THEN GOTO 9000
730 REM
735 CLS
740 GOSUB 8000
745 COLOR 4
750 LOCATE 10,5:PRINT "I WARP TO JUPITER":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
755 IF U>F AND U<40 THEN GOTO 760
760 IF U>F AND U<40 THEN GOTO 9000
765 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 725
770 REM
775 CLS
780 GOSUB 8000
785 CIRCLE(304,115),70,0,1,.5,5
790 PAINT(304,115),5,5
795 COLOR 4
800 LOCATE 5,5:PRINT "JUPITER"
805 FOR G=1 TO 5000:NEXT
810 IF F<0 THEN GOTO 9000
815 REM
820 CLS
825 GOSUB 8000
830 COLOR 4
835 LOCATE 10,5:PRINT "I WARP TO SATURN":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
840 IF U>F AND U<40 THEN GOTO 850
842 IF U>F AND U<40 THEN GOTO 9000
844 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 825
846 REM
847 CLS
848 GOSUB 8000
850 CIRCLE(304,115),70,0,1,.5,4
855 PAINT(304,115),4,4
860 COLOR 4
865 LOCATE 5,5:PRINT "SATURN"
870 LET F=F-U
875 FOR G=1 TO 5000:NEXT
880 IF F<0 THEN GOTO 9000
885 REM
890 CLS
895 GOSUB 8000
900 COLOR 4
905 LOCATE 10,5:PRINT "I WARP TO URANUS":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
910 IF U>F AND U<40 THEN GOTO 920
912 IF U>F AND U<40 THEN GOTO 9000
914 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 900
916 REM
917 CLS
918 GOSUB 8000
920 CIRCLE(304,115),70,0,1,.5,2
925 PAINT(304,115),2,2
930 COLOR 4
935 LOCATE 5,5:PRINT "URANUS"
940 LET F=F-U
945 FOR G=1 TO 5000:NEXT
950 IF F<0 THEN GOTO 9000
955 REM
960 CLS
965 GOSUB 8000
970 COLOR 4
975 LOCATE 10,5:PRINT "I WARP TO NEPTUNE":LOCATE 12,5:PRINT "HOW MUCH FUEL WILL
 YOU USE ";:INPUT U
980 IF U>F AND U<40 THEN GOTO 250
982 IF U>F AND U<40 THEN GOTO 9000
984 IF U>F THEN LOCATE 17,5:PRINT "                    ":GOTO 970
986 REM
987 CLS
988 GOSUB 8000
990 CIRCLE(304,115),70,0,1,.5,1
995 PAINT(304,115),1,1
1000 FOR G=1 TO 5000:NEXT
1005 IF F<0 THEN GOTO 9000
1010 REM
1015 CLS
1020 GOSUB 8000
1025 COLOR 4
1030 LOCATE 5,5:PRINT "CONGRATULATIONS-YOU MADE IT BACK TO EARTH"
1035 LOCATE 20,5:PRINT "PRESS ANY KEY FOR ANOTHER GAME"
1040 BEEP
1045 NEXT
1050 IF INKEY$="" THEN RUN
1055 GOTO 1050
9000 FOR G=1 TO 1000
9010 COLOR 5
9020 LET X=INT (RND(1)*639)
9030 LET Y=INT (RND(1)*399)
9040 LOCATE X,Y:PRINT "*"
9050 NEXT
9060 RUN
```

SPECTRUM
Crusher
By Tony Hosking

In this original game, you must move around picking up scrap metal before a car crusher squashes you. Full instructions are given in the game. Once you have typed it in, save it with GO TO 9999. Crusher works on the 16K or 48K Spectrum.

```
  5 LET s=0: BORDER 4: PAPER 5
: INK 0: CLS : LET y$=CHR$ 143
  6 GO SUB 9000
  10 GO SUB 7000
  11 LET sc=0
  12 BORDER 1: PAPER 7: INK 0
  14 GO SUB 7000
  15 LET a=INT (RND*9)+1: LET t=0
: LET m=10: LET n=10
  16 IF sc>=2000 THEN  FOR n=1 T
O 21: PRINT AT n,0;"                
                ": NEXT n: GO TO 9
000: PRINT AT (RND*20)+1,(IN
T (RND*30))+1; INK 0;y$: BEEP .00
5,(INT (RND*30))+1: NEXT n: GO TO
 9000
  18 PRINT  PAPER 1; INK 7;AT 0,
0;"Hi-Score";hi;AT 0,11;"score";
sc
  20 LET a$="": FOR k=1 TO 30: L
ET a$=a$+"-": NEXT k: PRINT AT 1,
0;a$
  30 PRINT  PAPER 0; INK 2;AT a,
b;y$
  35 LET t=t+1
  40 LET x$=CHR$ 145
  50 PRINT AT m,n; INK 1;y$
  58 IF INKEY$="5" THEN  LET n=n
-1: LET x$=CHR$ 144: NEXT t
  60 IF INKEY$="8" THEN  LET n=n
+1: PRINT AT m,n;x$: NEXT t
  70 IF INKEY$="6" THEN  LET m=m
+1: PRINT AT m,n;x$: NEXT t
  80 IF INKEY$="7" THEN  LET m=m
-1: PRINT AT m,n;x$
  81 IF m<1 THEN  LET m=1
  82 IF n<10 THEN  LET n=10
  83 IF n>21 THEN  LET n=21
  84 IF m>20 THEN  LET m=20
  85 IF SCREEN$ (m,n)=y$ AND POINT (n*8+5
,175-m*8-4)=1 AND m<a+1 THEN  LE
T sc=sc+1000: BEEP .05,-10: PRIN
T AT 0,11 PAPER 1; INK 7;"SCORE
";sc: GO TO 100
  90 IF SCREEN$ (m,n)=y$ AND POINT (n*8+5
,175-m*8-4)=1 AND m>a+2 THEN  LE
T sc=sc+250: BEEP .05,-10: PRINT
 AT 0,11 PAPER 1; INK 7;"SCORE";
sc: GO TO 100
  95 IF POINT (n*8+5,175-m*8-4)=
1 THEN  LET sc=sc-10: BEEP .05,-
10: PRINT AT 0,11 PAPER 1; INK 7
;"SCORE ";sc
  100 GO SUB 8000
  110 GO TO 25
  500 LET s=s+(m*5000): LET p=sc+s
: BORDER 1: PAPER 3: INK 7
  505 CLS : PRINT '''' FLASH 1;"
YOU MADE IT"
  510 PRINT AT 5,3; INK 7;"Boy yo
u are a hero !!!": PRINT '''' PA
PER 1; INK 7;"You have a total of
 ";p;" points"
  520 PRINT AT 10,3;"This is
 made up of ";sc;" for scrap metal
 and a Bonus of ";s
  525 PRINT AT 18,3; INK 7;"Well
 scrap metal is worth       today
"
  530 PRINT AT 20,3; INK 7;"DO yo
u want to play your       luck
 again Y OR N"
  535 IF a$="y" THEN  LET a=sc
  540 IF INKEY$="y" OR INKEY$="Y"
 THEN  GO TO 11
  550 IF INKEY$="n" OR INKEY$="N"
 THEN  STOP
  555 BEEP .25,0: BEEP .25,4: BEE
P .25,7: BEEP .25,12
  560 GO TO 540
  600 PRINT AT 20,11;"Do you want
 to try again Y OR N";AT 14,8;"Hi
-SCORE";hi
  605 IF sc>hi THEN  LET hi=sc
  607 IF INKEY$="y" OR INKEY$="Y"
 THEN  GO TO 11
  608 IF INKEY$="n" OR INKEY$="N"
 THEN  STOP
  609 GO TO 607
  700 BORDER 1: PAPER 0: INK 7: L
ET sc=sc+1000: CLS
  710 PRINT AT 3,2; INK 7;"THIS I
S THE LAST CRUSHER YOU       HAVE T
O FACE GATHER UP AS       MUCH A
S YOU CAN,WHEN YOU THINK       YOU HA
VE ENOUGH RUN INTO THE       BOTTOM
 RIGHT HAND CORNER       DON'T
HIT THE CRUSHER ARM,       THIS T
IME YOU SCORE       POINTS
 THE CLOSER YOU ARE TO       THE CR
USHER ARM BE CAREFUL''''       PRESS
 R WHEN READY."
  720 IF INKEY$="R" OR INKEY$="r"
 THEN  GO TO 12
  730 GO TO 720
  8000 IF sc>=2000 THEN  LET z=a+1
: LET a=INT (RND*9)+1: LET t=t+(
INT AT a-1,0)
  8005 IF a=20 THEN  FOR i=1 TO 10
: OUT 254,19: OUT 254,7: OUT 25
4,19: NEXT i: CLS : PRINT AT 10,
6;"GAME OVER": PAUSE 50: PRINT A
T 12,9; INK 7; PAPER 1;"YOU SCOR
ED ";sc: GO TO 600
  8010 IF z=a THEN  FOR i=1 TO 100
: OUT 254,19: OUT 254,7: OUT 254
,19: NEXT i: CLS : PRINT AT 10,1
0; FLASH 1;"GAME OVER": PRINT AT
 12,8;"YOU SCORED ";sc: LET a=0
: LET sc=sc-(t*10): GO TO 600
  8013 IF sc<110 THEN  LET sc=120
: GO SUB 9900: GO TO 12
  8014 IF sc<300 THEN  LET sc=480
: GO SUB 9900: GO TO 12
  8015 IF sc<500 THEN  LET sc=680
: GO SUB 9900: GO TO 12
  8020 IF sc<650 THEN  LET sc=1000
: GO SUB 9900: GO TO 12
  8040 IF sc>2600 AND m=20 AND n=3
0 THEN  GO TO 500
  8050 RETURN
  8500 PRINT AT 12,0; INK 7; PAPER
 1;"YOU SCORED ";sc: STOP
  7000 CLS : FOR i=0 TO 21: PRINT
 AT i,0; INK 1;y$;AT i,31;y$: NE
XT i
  7002 LET y$="": FOR i=1 TO 31: L
ET y$=y$+CHR$ 143: NEXT i
  7010 PRINT AT 0,0; INK 1;y$;AT 2
1,0;y$
  7020 RETURN
  8000 FOR i=0 TO 7: READ a: POKE
 USR "a"+i,a: NEXT i
  8010 DATA BIN 11111111,BIN 11111
111,BIN 01111110,BIN 01111110,BI
N 00111100,BIN 00111100,BIN 0000
1000,BIN 00001000
  8020 FOR i=0 TO 7: READ a: POKE
 USR "b"+i,a: NEXT i
  8030 DATA BIN 00011000,BIN 00111
100,BIN 00011000,BIN 11111111,BI
N 00011000,BIN 00100100,BIN 0100
0010,BIN 10000001
  9000 RETURN
  9100 BORDER 1: PAPER 7: INK 0: C
LS
  9110 PRINT AT 5,1;"IN THIS GAME
 YOU ARE THE       YOU TRAPPED IN
 A CAR CRUSHER.       YOU HAVE TO G
ATHER UP AS MUCH       SCRAP METAL A
S YOU CAN BEFORE       YOU ARE CRUSH
ED. YOU GET EACH TIME YOU GET
 SOME SCRAP AND IF       YOU GATHER EN
OUGH YOU WILL GET       OUT ALIVE...TO
 SE THE CRUSHER ARM TO MOVE, WAT
H OUT FOR CRUSHER       ARM BECAUSE I
T WILL KILL YOU IF       IT!"
  9112 PRINT AT 5,26;CHR$ 145;AT 2
1,7;"Press R to start"
  9120 FOR i=0 TO 6: PRINT AT i,10
: PAPER 4: INK 7;"THE CRUSHER": N
EXT i: BEEP .008,RND*10: NEXT i: NEXT i
  9130 IF INKEY$="p" OR INKEY$="P"
 THEN  CLS : BORDER 4: PAPER 7: I
NK 7: RETURN
  9140 GO TO 9130
  9900 CLS : PRINT AT 10,2;"WELL Y
OU MADE IT OUT OF THAT       ONE HO
W LETS SEE IF YOU CAN       MAKE I
T OUT OF THE NEXT ONE": FOR f=1
 TO 400: NEXT f: RETURN
  9999 SAVE "CRUSHER" LINE 1
```



SHARP PC 1251
Maths Problems
By Robert Gibberd

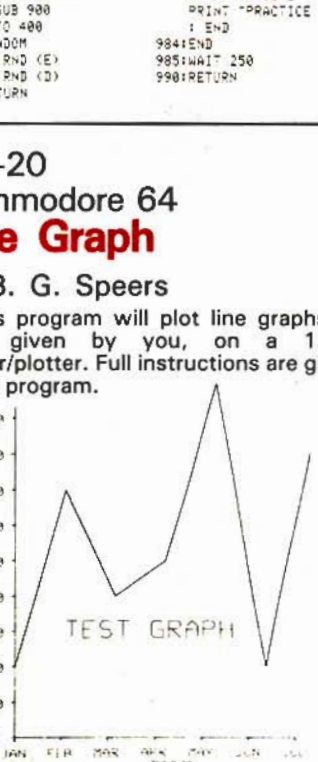
This program will quiz the user on maths problems. The user selects the maximum number which can occur in the problems, and the operation (multiplication, addition, division, subtraction). A tally is kept of correct and incorrect answers, and the score given as a percentage at the end.

Note that for the division questions, remainders are required and not decimal fractions, so the program is particularly suited for testing primary school children.

```
10:REM ********
20:LET S=0:LET C=0:LET E=0
30:CLS :PRINT "SELECT UP TO"
   "ENTER 2ND UP TO ";E
40:INPUT "WHICH OPERATION (+,-,*,/)
   A$:IF A$<"+" OR A$>"/" THEN 40
50:IF A$="+" THEN G=1
60:IF A$="-" THEN G=2
70:IF A$="*" THEN G=3
80:IF A$="/" THEN G=4
90:ON G GOTO 300,100,140
100:IF A=0 THEN 170
105:REM ********
110:GOSUB 500
120:F=B*C
130:GOSUB 800
140:GOSUB 900
150:GOTO 110
155:REM --------
160:GOSUB 500
170:IF B<C GOTO 160
190:C=-C:F=B*C:C=-ABS C
200:GOSUB 800
210:GOSUB 900
220:GOTO 160
295:REM ********
300:GOSUB 500
310:F=B+C
320:GOSUB 800
330:GOSUB 900
340:GOTO 300
395:REM ////////
400:GOSUB 500
407:IF B<C GOTO 400
410:F= INT (B/C)
420:X=F*C:R=B-X
425:IF R=0 LET J$= STR$
   (F): GOTO 440
430:J$= STR$ (F)+"R"+
   STR$ (R)
440:PRINT B;"/";C;" = (
   WAIT )";: INPUT "ANS
   = ";A$
460:IF A$=J$ PAUSE "CORR
   ECT": BEEP 2:S=S+1:
   GOTO 480
470:PAUSE "INCORRECT":
   PRINT B;"/";C;"=";J$
475:BEEP 1:O=O+1
480:GOSUB 900
490:GOTO 400
500:RANDOM
510:C= RND (E)
520:B= RND (D)
530:RETURN
800:PRINT B;A$;C;" =
   ( WAIT )"
810:INPUT "ANS = ";W$
815:G= VAL W$
820:IF G=F PAUSE "RIGHT"
   :R=1: BEEP 2:S=S+1:
   GOTO 840
830:PRINT "WRONG ";B;A$;
   C;"=";F
835:BEEP 1:O=O+1
840:RETURN
900:"S";1 WAIT 64: PRINT
   "ANOTHER PROBLEM ?"
910:CALL 61:E0
930:U$= INKEY$
940:IF U$ THEN 960
950:GOTO 930
960:IF U$="Y" PAUSE "YES
   ? GOOD !":M=0: GOTO
   985
980:IF U$="N" PRINT "NO.
   =)";P= INT ((S/(S+O)
   *10000)+.5)/100:
   PRINT "YOU GOT ";P;"
   % ": GOTO 982
981:GOTO 930
982:IF P=100 PRINT "EXCE
   LLENT "!: END
983:IF P<50 PRINT "YOU B
   ETTER DO SOME ":
   PRINT "PRACTICE ..!"
   : END
984:END
985:WAIT 250
990:RETURN
```

VIC-20
Commodore 64
Line Graph
By B. G. Speers

This program will plot line graphs of data given by you, on a 1520 printer/plotter. Full instructions are given in the program.



Calling all CAPs —

Home computers: educational tool or expensive toy?

by Ann M. Frampton, Education Department, Otago University

When I was driving home from a meeting the other night, an advertisement on the radio caught my attention. It said, "If you don't have a computer at home you could be holding your children back."

This is the attitude that a number of computer sales people are taking when promoting home computers. The inference is that if Johnny does not have access to a computer at home, he will not be as well educated as Susie next door who has a computer in her bedroom. How do we as educators view this contention? What should we do about it?

As a secondary school teacher involved with teaching computer awareness and running computer camps, I was often asked to give my opinion on what brand of computer a family should buy for their children. The question has never been should we buy a computer? or what educational value would a home computer be to my children? This seems to be a strong indication of the effectiveness of the advertising campaign of computer sales people. It is my belief that parents should be confronted with these questions before they consider the hardware issue.

It is often difficult for parents to know why they think that the purchase of a computer is so important. The parent knows that it is important that Susie "gets computers," but has no understanding of what that may mean. In fact, another term which has been added to the ever increasing computer jargon is the C.A.P. — The Computer Anxious Parent. Some information on the wide range of computer applications is needed before a parent can make an informed decision as to whether a computer is important, and what type of computer is most suitable.

Perhaps the most obvious distinction here is whether the aim is for children to use a home computer to learn how to write programs, or whether they should be using it as a tool to learn subject matter. The former seems to be what happens in general, (if the home computer is used for anything other than playing games), probably because it is an activity which does not involve any additional expense.

Languages

There are a number of programming languages available for home computers, but the one which is built in and therefore does not involve any additional expenditure is BASIC. This is a very common language, and thus learning some skills in BASIC programming may be useful for children, although some would argue that this sort of self-taught BASIC programming is likely to lead to the development of bad programming habits which may be a hindrance to serious programming at a later stage.

The Logo language is perhaps more suited to children, especially primary school chidren, since the emphasis here is on problem solving and encouraging logical thought rather than the programming processes themselves. Unfortunately, Logo will only run on machines with a relatively large amount of memory in terms of home computers (usually 64K), and involves extra expense as it does not come already in ROM, but has to be purchased separately.

To use the computer as a tool also requires the purchase of additional software — always expensive and often of questionable quality. The lack of good educational software is all too evident if parents ask to be shown some packages which would help Johnny, who is in Standard four, with a particular part of his education, for example his reading or science or spelling. Parents should ask to see a demonstration of software and be assured that there is at least one good quality program at their child's level which will be of educational value, if this is their aim in buying a computer.

The computer can be used as an aid to learning in a variety of ways. One particularly powerful way is through the use of a word processing package. This can provide Johnny with a method of writing and editing written material and producing something of a standard which was never previously possible because of the constraints of poor handwriting or the drudgery of constant rewriting to correct errors. Keyboard skills may be regarded as a problem here, since children can be painfully slow in finding the appropriate keys, but they generally learn quickly — even a three year old rapidly learns where particular keys are found if he is rewarded with a picture that he likes on the screen, as in some alphabet programs.

Thus, as an educator I feel that it is extremely important to discuss with parents considering the purchase of a computer their expectations of how it will contribute to their children's education. Is it the aim of the parents that their children learn how to program in BASIC? Should the computer be used as a sort of private tutor for individual children? Is it necessary for children to practice their handwriting skills whenever possible, or is there a place for word processors in some written language work? These are just some of the questions which could be asked. The main point is that before the purchase of a home computer, the family ought to have a clear idea of what they intend to use it for, and make sure that the particular brand of machine that they choose is capable of meeting these objectives.

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COMPUTER CULTURE

A Reed Methuen Book

Logo for children

1,2,3, MY COMPUTER AND ME By Jim Muller $38.85

PRIMARILY LOGO by Donna Bearden & Kathleen Martin $38.85

ATARI LOGO IN THE CLASSROOM by Donna Bearden $44.85

Published by the Reston Publishing Company, a division of Prentice-Hall

Reviewed by Jenny Chisholm

As a computer language in the hands of a creative teacher, Logo has introduced a multitude of today's children to a world of discovery that has been claimed to have "no threshold and no ceiling." The child who does not respond to Logo's challenges is usually one whose teacher has not grasped its possibilities, and who has been taught commands and procedures by rote rather than through exploration and creativity.

For the teacher who wants her class to enjoy the Logo experience but who has no training opportunities nearby, any one of these books will be a stimulating guide and confidence-builder. The authors have been associated for several years in the *Young People's Logo Association* with its lively newsletter *Turtle News*. Jim Muller is an engineer whose enthusiasm for home computers expanded when his son and his son's high school friends became interested; Donna Bearden trains teachers and develops curriculums for school districts; Kathleen Martin Ph D is a professor of education at the University of Dallas and has been the receipient of four National Science Foundation grants to help primary school teachers work more creatively in the classroom with science and maths. As Martin-Bearden Inc, the two latter publish a quarterly publication for Logo users called *Microquests*.

1,2,3, My Computer and Me is subtitled *A Computer Funbook for Kids*, and is a companion volume to an earlier publication authored by all three writers and called *The Turtle's Sourcebook* (still available from Reston). It takes "anyone from 2 to 102" adventuring with Logy the turtle and Morph the rabbit, with lively illustrations and any amount of blank space for writing in the kid's own inventions. A Game I Made Up; A Game my Friend Made Up; What if we changed the REPEAT number to 90? Try some of these shapes or make up some of your own to try. And every so often a short review is slipped in, in a very non-threatening way.

My Atari version of this book has a section on multiple turtles, as well as covering, quite simply, variables, recursion, colours and music, and X-Y co-ordinates. Other versions are available for Apple/TI and Commodore.

Primarily Logo has a strong plastic spiral binding. It is directed at teachers and parents of 5- to 9-year-olds. It begins with pre-Logo activities using body geometry and toys and games, illustrated with photographs. The introduction to the exploration of shapes on the screen is by means of single-keystroke procedures, still having children step out shapes before investigating them on the computer.

One of the values of this book is that, even at this stage, it does not restrict itself to turtle graphics, but has a chapter on list processing, including Brags, Parts of Speech, Mad-Libs and Adventure Games.

The text uses LCSI Logo with each procedure repeated in MIT Logo. Discs containing the procedures used may be ordered from the publisher for Apple Logo, Terrapin and Krell Logo for the Apple, Commodore, Atari, and IBM or Dr Logo for the IBM.

Atari Logo in the Classroom, also spiral-bound, starts with the four Atari Logo turtles and makes the most of Atari Logo's special features. While it is directed at parents and teachers, it has blank spaces for filling in students' ideas: these might well be used in a classroom as photocopied sheets.

All three books are appropriate for children at least as young as five, and there are ideas for bright pre-schoolers. But even a Form 2 student would enjoy romping through them, and there is much that would stimulate the slow learner too.

It is unfortunate that publishing costs and the state of the NZ dollar have made the present cost of these books so high. Nevertheless, anyone who has children and Logo should make the effort to buy at least one of them.

If your local bookshop cannot get these books for you, write to Classroom Computers Limited, 13 Arden Way, Wilton, Wellington 5.

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IBM

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Richard Heskell & Glenn A. Jackson

Hands-on, step-by-step approach for beginning and advanced programmers. Uses actual photographs taken from the computer screen in graphic examples to develop many fundamental programming concepts. Includes information on string variables and functions; IBM PC DOS numerical variables and arithmetic, expressions, sound effects, medium resolution graphics, loops and subroutines, bar graphs, animated graphics.

Prentice-Hall — **Our price $27.10. Save $2.20**

The IBM PC Connection
James W. Coffron

From the author of the popular Apple Connection, VIC-20 Connection and Z80 Applications, this book shows how easy it is to use your computer with common household devices. Explains techniques for setting up your IBM to control a home security system, home temperature control system, voice synthesizer to make your computer talk, as well as other home appliances.

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Data File Programming on your IBM PC
Alan Simpson

Presents the techniques for writing BASIC programs for mailing list systems, grade books, library referencing system, graphic displays. Covers adding files, searching, sorting, editing and printing formatted reports.

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Your IBM PC Made Easy
Jonathan Sachs

Covers the fundamentals and details major features of the system, including coverage of DOS 2.0 and the PC XT. Step-by-step operating instructions, and a guide to resources — what you need to know about dealers, software, services and accessories. Reference guide to operations and troubleshooting for common problems.

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Science & Engineering Programs for the IBM PC
Cass Lewart

Presents 19 programs designed to make optimum use of scientific and engineering applications. Thorough documentation, sample runs, formulae, illustrations and listings. Includes programs for plotting and interpretation, numerical function evaluation, modulation schemes, system reliability evaluation, base-to-base conversion. All programs in IBM PC BASIC and compatible with BASIC versions of 1.10 and 2.0.

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Computer Graphics for the IBM Personal Computer
Donald Hearn & M. Pauline Baker

Discusses basic concepts and techniques of graphics, and explores IBM PC's capabilities for these applications. Examines methods for creating two and three-dimensional pictures and graphs, and shows how to manipulate and animate displays. Also analyses make-up of PC and its graphics features.

Prentice-Hall — **Our price $41.70. Save $3.40**

Your IBM PC Made Easy (includes IBM PC (DOS 2.0) and PC XT)
Jonathan Sachs

Covers the fundamentals and details the major features. Step-by-step operating instructions and a guide to resources telling you what you need to know about dealers, hardware, software, services and accessories. There's also a reference guide for operations and troubleshooting common problems.

McGraw-Hill — **Our price $29.55. Save $2.40**

Language/programming

Structured Programs in BASIC
Peter Bishop

Opens with a discussion of program structure and design. The rest of 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 its versions — IBM PC-DOS, and Versions 1.0, 1.1, 1.25, 2.0 and 2.1. Covers each computer running MS-DOS, gives the version it runs and lists any improvements the manufacturer has made to the system. Complete information on IBM PC-DOS. Information on software that runs under MS-DOS and products available to enhance the system.

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Armchair BASIC: An Absolute Beginners' Guide to Programming in BASIC
Annie & David Fox

Easily-followed introduction — you don't need a computer to learn. Blends numerous examples and illustrations in a good-humoured explanation of programming concepts. Guides you through BASIC programming fundamentals, shows how a computer can use your input to produce useful results, and presents a glimpse into the computer future.

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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 operators; works with loops, strings, arrays and subroutines, sequential and random access files; debugging and documenting programs. Includes five fully documented business programs which can be customised.

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Play LOGO: An Invitation to Computing for Parents and Children
John Cunliffe

Anyone who can operate a television set and a typewriter keyboard should enjoy this book written for the young learner and the interested adult. Tells how to choose a computer for LOGO, how to write your own programs, and suggests projects and puzzles. Attractive format and easy to follow.

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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**

An Introduction to Program Design
Rod S. Burgess

Deals with program design, particularly for data processing applications, using the Jackson structured programming technique. Examples of code are given in COBOL, BASIC and Pascal. Each chapter concludes with exercises, with solutions at the end of the book.

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BBC

Handbook of Procedures & Functions for the BBC Micro
Audrey & Owen Bishop

Variety of procedures and functions that can be used with programs of all types. Description of what each does, followed by a listing and an explanation of how it works. Example of a calling program showing how to incorporate each procedure or function into your programs.

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Exploring Music With the BBC Micro & Electron
Kevin Jones

Explores creative ways of using the computers to make music. Shows how to generate sounds, and combine sound characteristics and rhythms. Covers wide range of styles — pop, folk, classical and modern. Examines many musical ideas and techniques.

Pitman — **Our price $36.00. Save $2.95**

Getting the Most From Your BBC Micro
Clive Williamson

Introduction intended to complement the User Guide supplied with the machine. Contains many hints and tips on programming and general use. Explores many possible uses and the computer's potential for expansion to suit individual needs. Some features and accessories, undocumented in the User Guide, are investigated, with specific advice on connecting printers, TV monitors and disk drives.

Penguin — **Our price $13.80. Save $1.15**

BBC Micro: Music Masterclass
Ian Ritchie

Professional musician starts with the essentials of programming sound and music, harnesses bytes and beat to show the way to the harmony of clefs and chips of electronic music. BBC can be a drum machine or synthesiser, instrument or interface, component or composer. Introduces music notation and theory of chords and harmony.

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21 Games for the Acorn BBC Micro
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Collection of games programs specifically written to exploit the BBC's sound, colour and graphics capabilities, and learn BASIC programming skills as you go. Each game comes with an explanation of how its program works, along with tips on how to modify or personalise it to create variations.

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Spectrum

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.

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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 and a glossary and bibliography.

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An Expert Guide to the 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.

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The Sinclair User Book of Games & 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 in 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**

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 principles.

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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.

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Sub-titled "Competent 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.

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Animation, Games and Sound for the IBM PC
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Learn by having fun through brief discussions and programs at first, and ready-to-use examples to help you create new games and practical applications. You learn programming skills in the process.

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The Complete Guide to Software Testing
William Hetzel

Explains how software can be tested effectively and how testing should be managed within a project or organisation. Aimed mainly at the software practitioner, it covers concepts of testing, testing techniques, methodologies, and management perspectives. Each chapter contains examples and checklists to help the reader understand and adapt material to personal needs. Case studies based on the author's experience.

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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.

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Easy Writer for the IBM Personal Computer
Don Cassel

Designed to help you learn Easy Writer and evaluate its capabilities before buying. Your system needs 64K RAM, a single floppy disk drive, a monochrome 80-column monitor and a printer.

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Computer and Telecommunications Handbook
Jeff Maynard

Gathers together a vast amount of information and data . . . standards, reference data, tables, symbols and the like from ASCII character codes to telex answerbacks, from logic IC types to decimal/octal conversions, from flowchart symbols to CCITT standards, from international radio frequency allocations to inductance formulae. Intended as an aid for anyone seriously involved in telecommunications.

Granada — **Our price $52.70. Save $4.25**

Commodore 64 Program Building Blocks
Ewin & Shirley Gaby

A library of basic modular programs and subroutines that can be "linked together" to form your own customised programs. All the building blocks of this basic set of core programs have been fully tested and are ready for use.

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School Days for the Commodore 64
Clair Bailey Passantino

Collection of bit-sized programs for children. Each program accompanied by programming hints and suggestions for parents and teachers. Mixture of fun and education, often both at once.

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WordStar on the IBM PC
Richard Curtis

Complete guidebook written in clearly understood style. Assumes no prior knowledge of WordStar or the IBM-PC. Includes all enhancements the IBM-PC brings to WordStar, along with add-ons such as MailMerge, SpellStar, StarIndex and CorrectStar.

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Commodore 64 Trivia Base; Database & Trivia Game
James F. Hunter & Gregory L. Guntle

Introduction to databases and their applications, discusses user-friendly data entry, error checking and program continuity; compares cassette and disk files; includes sample trivia database with 100 questions and answers; provides tips on making programs faster and more efficient; helps users put parts of database together and learn how to use the program.

Sams — **Our price $19.10. Save $1.50**

Getting the Most From Your Computer Jan Owen
Collection of up-to-date information of software and what to look for when buying it; recommends programs for word processing, database management, spreadsheets and home accounting; making the computer pay for itself; corporate computer careers; communicating via modems; educational programs; solving adventure games; programming languages.

McGraw-Hill — **Our price $27.70. Save $2.20**

The Network Revolution: Confessions of a Computer Scientist
Jacques Vallee

Vallee argues that information is control and as computers give access to information, we have the choice of using this control as a tool for repression and standardisation of people's lives, or embracing interpersonal communication and meaningful contact. Explores depersonalisation and repression, vulnerability of computers to accident and criminal interference.

Penguin — **Our price $10.00. Save 85 cents**

The Commodore 64 Home Companion
George Beekman

Combines three functions into one book — computer as-home-appliance manual, BASIC programming text, guide to hardware, software, programming etc. Covers buying and hooking up, and computer care, hands-on lessons, Commodore BASIC programming, specific programs to use.

Reston — **Our price $44.85. Save $3.65**

A Guide to Computer-Age Parenting Peter Scharf
Sets out to help your children learn with a computer. Covers "history" of family computing, using software with children, family games, and children, computers and careers. Useful for parents wondering which computer to buy and for experienced computer parents. Includes 20 family computer activities and computer education resource suggestions for parents. Plus 50 reviews of educational software.

McGraw-Hill — **Our price $25.85. Save $2.10**

The VisiCalc Applications Book for Apple IIe
Jack Grushcow

Written for both the advanced and novice VisiCalc user, it concentrates on the most troublesome areas. Sample model used to demonstrate each section in a step-by-step, stroke-by-stroke manner. Focuses on financial statement analysis, forecasting, budgeting, cash management, credit control and portfolio management.

Reston. — **Our price $48.60 Save $4.05**

Using the Commodore 64 Without Learning BASIC
Tim Kelly

Clear, concise statement of the few rules you need to know to get your computer up and running. Covers the keyboard; program loading; run and stop; transferring and copying programs; printers; service and maintenance; choosing software; error messages.

Reston — **Our price $29.00. Save $2.40**

Probots and People: The Age of the Personal Robot
Timothy O. Knight

Meet Hero, AndroMan, F.R.E.D., Topo, B.O.B. and RB5X, all part of the new family of personal robots. Knight describes how useful and fun the androids can be. Non-technical, comprehensive survey of the world of "probots", previewing the upcoming "robot revolution".

McGraw-Hill — **Our price $25.85. Save $2.10**

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 and DR/Net. Advice on troubleshooting, full index and bibliography, and three machine-specific appendixes on the IBM PC and XT, DEC Rainbow and CompuPro.

McGraw-Hill — **Our price $41.60. Save $3.35.**

Software Construction Set for the IBM PC & PC Jr
Eric Anderson

Complete package of software tools to help in designing and building programs. Contains techniques, advice and individual routines to help you build custom-made programs. Reference for information storage and retrieval, data searches, sorts, window building, using disk files, display charts and graphs.

Hayden — **Our price $51.75. Save $4.20**

Apple

Getting Started With ProDOS
B. M. Peake & D. Rorke

Aimed at Apple II and IIe users, this is intended 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 of the advantages and disadvantages of the system. A list of further references is included.

Bluewater Press — **Our price $6.45. Save 50 cents**

Applesoft Basic: A Teach-Yourself Introduction
B. M. Peake

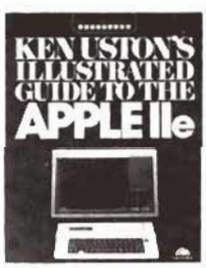
Second edition revised to cover the Apple II Plus and IIe. A manual for New Zealanders to learn BASIC with the Apple, instead of picking information from two or three sources includes model answers. Enquiries for class sets welcome.

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 program 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 instructions 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 normal price $35.95**

Apple Programming for Learning & Teaching
Frederick H. Bell

Contains more than 50 applications programs focussing on teaching and learning skills. While learning BASIC through a building-block approach, you can also teach the children arithmetic, spelling, capital letters, random numbers, square roots, geometry and graphics. Programs provide quizzes, games and fun.

Reston — **Our normal price $47.00**

Apple Home Companion for the Apple II, IIe & IIc
George Beekman & Dennis Corliss

Three books in one — instruction manual for the computer as a home appliance; learning BASIC; learning about hardware; software and programming. Includes reviews of popular Apple software, "hands-on" lessons on using the Apple, how to buy, hook up and care for your Apple, Applesoft BASIC programming, word processing, education, games, databases, telecommunications, graphics, music and peripherals.

Reston — **Our normal price $55.35**

The Apple House
John Blankenship

Explains how to customise 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 normal price $41.50**

Spectravideo

Games For Your Spectravideo
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

Business

Multiplan: Home & Office Companion
Elna Tymes & Peter Antoniak

Collection of models covering a broad spectrum of business and personal applications, personal finance, household management. Ready-to-use model described and accompanied by the listing needed to create the model and a sample printout. You just replace the sample data with your own. As you become familiar with Multiplan, the modelling techniques help you create customised models.

Osborne/McGraw-Hill

Our price $36.95. Save $3.00

Lotus 1–2–3 Simplified **David Bolcan**

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 use 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 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 practical 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

Multiplan Made Easy (Macintosh ed)
Walter A. Ettlin

All-in-one tutorial incorporating practical applications and skillbuilding exercises. Covers everything from using basic Mac commands to formatting worksheets, building formulas, and using Multiplan's built-in functions. Fully illustrated to display the program's visual features.

Osborne/McGraw-Hill

Our price $34.20. Save $2.75

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 macros, 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

Doing Business With Multiplan
Richard Allen King & Stanley R. Trost

Quick, well set out guide presenting more than 20 accounting and management planning applications for the business user. Each is thoroughly described, and a complete template for setting up the application in Multiplan presented. Many usable "as is", others can be modified for specific problems. Covers record keeping, financial statement analysis, sales finance manufacturing, master budgeting.

Sybex

Our price $55.45. Save $4.50

Taking Care of Business with your Commodore 64 **David P. Dautenhahn**

More than 100 brief BASIC business 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 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.

Haydon

Our price $35.60. Save $2.90

1–2–3 Run: 41 ready-to-use Lotus 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 simplify work, the models include applications for sales, accounting, real estate and the classroom.

Osborne/McGraw-Hill

Our price $38.80. Save $3.15

pfs Software Made Easy **Carl Townsend**

Step-by-step tutorial to the pfs series — pfs Write, pfs File, pfs Report, pfs Access and pfs Graph. Programs will work on the IBM PC and XT, Apple IIe IIc and III, and the TI Professional — and you will need at least one disk drive, preferably two, or a hard disk system. Book includes tips for integrating programs and working with advanced applications.

Osborne McGraw-Hill

Our normal price $41.60

Integrated Spreadsheet Software: Lotus 1–2–3, Context MBA and Symphony **Linda O'Keefe**

Examines all three programs, with emphasis on Lotus 1–2–3 and Context MBA. Describes them from the point of view of the business person wanting to increase efficiency without becoming a computer "techie". Compares strengths and weaknesses, and discusses suitability for different types of user, and provides a framework for evaluating integrated programs.

Osborne/McGraw-Hill

Our normal price $41.60

Games

Arcade Games for Your VIC-20
Brett Hale

A 15-year-old whizz kid from Victoria, Australia has put together a collection of 20 arcade games for the unexpanded VIC-20. All programs listed twice — once for 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

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

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

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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 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.

Corgi

Our price $12.00. Save 95 cents

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.

Granada

Our price $20.30. Save $1.65

Commodore 64: Basic Programs in Minutes
Stanley R. Trust

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

Commodore 64 Logo Primer **Gary G. Bitter & Nancy Ralph Watson**

Divided into three distinct sections – a gradual development of Logo with no user prerequisites except access to a Commodore computer with Commodore Logo; Quick-Start Logo for the person who has some familiarity with the language; and a broad overview of Logo, including its historical development along with useful applications. Together, they give comprehensive cover useful for the both and advanced and novice user.

Reston

Our price $37.35. Save $3.00

Commodore 64 Computer Graphics Toolbox
Russell L. Schnapp & Irvin G. Stafford

Shows how to create cartoon characters, maps, calendars, geometrical forms, game boards and game pieces on the C64. Series of working programs charts your progress and a turtle graphics program and two editors provide the tools for drawing pictures and demonstrating the features of advanced graphics systems. Assumes no special mathematical or programming background, and you learn by doing.

Prentice-Hall

Our price $32.90. Save $2.70

Music & Sound for the Commodore 64
Bill L. Behrendt

Suitable for almost anyone, is written in non-technical language supported by listings and illustrations. Sets out to provide you with access to the full music-generating capacities of your 64, letting you create and play all kinds of music, simulate musical instruments, make almost any sound.

Prentice-Hall

Our price $31.15. Save $2.50

How to Program the Commodore 64 — if you've never programmed a computer before
Robert Young

After an introduction to the bits and pieces of the 64, you move to the process of learning to program on the keyboard. Concentrates on the key words and techniques to have you writing programs as quickly as possible, then allows you to refine the process at your leisure.

Interface

Our price $21.20. Save $1.75

A time saver for programmers

By Michael Fletcher

One of the more useful programs that I have had to review this year is the MMg compiler from MMG Software Ltd. This program can be used by the novice basic programmer and as long as your program is written mostly in Basic will work a great deal of the time.

One of the most challenging and frequently frustrating aspects of owning a computer is learning how to program it correctly. This task is usually first learnt with the language that comes free with your Atari computer — Atari Basic. However, once this task is completed many of the programs that you have written may not come up to your standard, especially games that involve graphics and fast moving characters. I believe this is because the language is too slow to handle many of the functions of the faster and more complex languages such as machine code.

There is a new product which can help solve this problem: this program is called the MMG Basic Compiler. It is relatively easy to operate and is supplied on a disk. It converts slow Basic programs into exciting and fast machine code programs that, as MMG says, "rivals those of the professionals."

To use the Basic compiler you need at least one disk drive, 48k of RAM and one Basic program to be compiled. The information provided on the pages of the instruction manual are very helpful and appear to cover all sorts of problems.

One of the problems that I have encountered is the requirement to constantly swap the Basic program disk and the destination disk throughout the process of the program but this is really a minor inconvenience considering you will be gaining a machine code program that would normally take you 10 times as long to write in source code. In this sense the MMG Basic compiler is a great time saver.

To compile the Basic program takes time but is well worth the effort — your slow Basic program will be turned into a high-speed machine language wonder.

The first step is to remove all the cartridges from your machine, insert the MMG disk and load it as you would any normal machine code game. After the title screen has appeared press "c" to load the main program. When it is loaded you will be prompted to insert your Basic problem disk and then type the name of the program. It is important to remember to type the whole name of your file especially .BAS or .OBJ because without these the program won't load and you would have to reload the compiler and start again.

Once the program has been loaded you are ready to start compiling. You are first offered a choice of either integer or floating point arithmetic. The faster of the two is integer but this can sometimes limit the arithmetic used. Once you have chosen between integer and floating point your program will begin to compile.

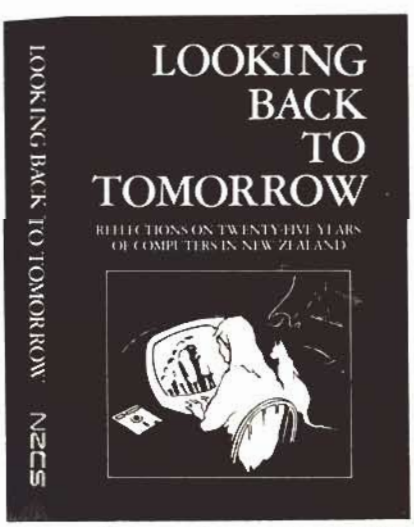
The first pass of the compiler over your program involves a process of compiling each individual line one at a time. This may sound like a long process but it is actually a surprisingly short one and is normally over quite quickly. After the first pass over is completed half of your program has been compiled, and all that remains is to follow the computer prompts through passes two and three.

When all three passes are completed you are offered 3 choices: to print the program, run the program, or return to DOS. After I compiled by first program, GTIA demo, I ran the program and found the difference in speed was incredible. In the Basic program five round cylinders were drawn on the screen, a process which took about 1 minute on the original Basic program and which in the compiled version took just a couple of seconds. If you want to run your compiled program without the help of the compiler, simply reboot your DOS disk and choose the L option. The program will automatically start once you have picked this option.

MMG Basic compiler is a 48k disk, costs $179.00 and is available from Stargate Enterprises, P.O. Box 2240, Tauranga South, Tauranga.

'Looking Back to Tomorrow'

A new book to commemorate the Society's 25th anniversary in New Zealand, and the 25th anniversary of the introduction of electronic computers in New Zealand.



192pp illustrated cased $25.00

Chapters on the use of computers in government, banking, commerce, industry and education; a glimpse of information systems before the arrival of the pakeha; and some unexpected New Zealand connections with Charles Babbage, designer of the largest mechanical calculator in the world. The book also looks toward the future of NZ's computer industry and associated social implications; and includes pen sketches of those involved in the early days of computing in New Zealand.

For those who have been closely involved with computers in New Zealand it will bring back memories of early days. For new converts there is much to learn from the problems that have been overcome, and fascinating insights into problems still to be resolved.

Published by the New Zealand Computer Society, distributed by :

PITMAN PUBLISHING NEW ZEALAND
28 FITZHERBERT STREET
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A scrapbook for the very young

by Gary Parker

The Spectrum has a moderately large selection of educational software available for it, even if some of this isn't exactly stunning quality.

You can get a Spectrum to teach French or Physics, but can you get it to help with learning to read? There is very little good software for young learners available. Perhaps people still believe that computers are just for adults and, more recently, older children. But as most home computer owners will have realised, young children love having a poke at that computer keyboard too.

OTTO'S SCRAP BOOK is a program combining several activities for young children which aims to fill this void. The program's author, Margaret Copland, explains why she developed Otto's Scrap Book:

"The home computer opens up exciting possibilities in the teaching of language. However, most of the programs I have seen test or reinforce a single skill. My own children wanted to use the computer as a typewriter. They wanted more than one activity to be available and grew tired of waiting for programs to load.

"They wanted programs that could be shared with younger brothers and sisters. They wanted creative, open-ended activities where they could use their new skills in reading and writing. 'Scrap Book' was developed in response to these needs."

From what I'd seen of young children using my Spectrum that sounded like the sort of thing they wanted, so I was interested to have a look at Otto's Scrap Book.

Professional program

You can tell a lot about a program by the screen picture (or lack of one) that appears while the program is loading. Otto's Scrap Book rapidly draws a bright screen display of a house, which provides a cute picture and saves on loading time. Immediately, you get the impression that you're loading one of the more professional educational programs.

Once loaded, Otto the Clown and his scrap book appear, and you are offered a menu with three options.

• **Option 1** allows you to write on the screen in large letters. This sounds deceptively simple, but it is just the sort of thing young writers need, and there is perhaps more to making this suit young children than meets the eye. You realise this when you see that the letters are very large and very clearly formed to match the style young children will be aquainted with.

• **Option 2** is the most complex option, Otto's Scrap Book. A large, bright picture of Otto the Clown appears, and he asks you to enter your name. Once this is done, you are asked to press S if he is sad or H if he is happy, while his facial expression changes. If he is sad, Otto explains that he has lost his paints in a maze which surrounds his house (he even sheds a few tears!). Then a simple maze is drawn and you guide Otto through the maze (using the R, L, U, and D keys for right, left, up, and down, which should teach directions and the words for them).

As you discover paint pots, part of the maze changes to the colour of the paint, and when you reach the bottom, a large picture of Otto's house is drawn. Then you can help paint the house. Otto shows the colours available and the names for them, and then asks what colour you would like each part of the house to be. You have to type in the whole name of the colour to be understood, so this part teaches simple reading and writing.

If Otto is happy, he shows you his paints and his building blocks, with which you can draw a chunky picture on the screen.

• **Option 3** allows you to draw pictures without having to deal with Otto first. This is quite a fully-featured picture-drawing program in its own right, with a selection of user-defined graphics to use, the ability to draw circles and write words, send the picture to a printer (you can configure the program to work with your printer) and so on. Inevitably, its good range of features mean that there are quite a lot of keys to use, and young children will need help here. A card is supplied which lists the keys to use.

Overall, Otto's Scrap Book is quite a professional program and certainly one of the better young education programs I have seen. I particularly like the way that great care has obviously been taken in tailoring the program to suit young children — for instance the way writing appears on the screen slowly, a letter at a time, in very large clear lettering.

Some instructions are in normal Spectrum lettering, and parents will still be required to guide very young children through the program. Some adults might be reticent at spending money on 'a simple little kids program', but once you have had a good look at a program like this you realise there is more to writing a young education program than meets the eye. If a program helps your kids learn to read and write (and become familarised with computers) it is probably well worth the money.

Otto's Scrap Book, for 48K, is priced at $24.95. It is distributed by Software Supplies Ltd and should be available through most leading retailers, or alternatively you can obtain it directly from Margaret Copland, Box 4, Kirwee, Canterbury.

Saving pics

Last month I showed you how to save a program as code, which when combined with a POKE renders programs unlistable. The same method can also be used to save a picture with the program in one large block of code.

Normally, of course, you can save a picture using SCREEN$, but your program must still be loaded separately. With this method your picture will be loaded at the same time as your program. All you have to do is alter the starting address when saving the program.

To save the program alone, as was done last month, you use the starting address of the system variables (23552) as the start of the code specified when you save it. To save the screen picture as well, you start saving from address 16384, which is the start of the display file. You also have to adjust the amount of code you save to include the extra screen memory saved. This extra memory is about 7K (6912 bytes to be exact), so add 7000 bytes or so when saving the picture as well as the program. To try this, enter and run this program:

It will draw a screen display, and when this is complete you should save the program with

SAVE "pick prog" CODE 16384, 8000: RUN 10

When you clear the screen and load it (with LOAD""CODE) the screen display will appear again, and the program will also be loaded.

You can also save the attributes alone, without the hi-res screen picture. This would load much faster, and you could create a chunky picture using the attributes only. Begin the save at 22528, which is the start of the attribute file. The attributes only take up 768 bytes, so you only have to add 1K or so when saving a program. To test this, run and save the above program again with

SAVE "att prog" CODE 22528, 2000: RUN 10

When you load this, the coloured stripes will appear without the circles.

There are other possibilities too. You cold load, say, only a third of the display file, or only the last few lines of the attributes, or only the printer buffer. Experiment!

Character editing

Character editing is the process of redrawing the characters the computer uses, either to the screen or printer, rather than using those on the keyboard. This allows you to draw just about anything you want, in colour, to create games or other program backgrounds.

A character that appears on the screen is an 8 x 8 grid of dots, some of which are on, some off, depending on the pattern that makes up the character. This 8 x 8 block fits into the overall 40 x 25 grid of rows and columns on the screen, which in turn gives a 320 x 200 dot pattern.

Changing character patterns is not that difficult if you realise what you are doing and why. Normally, the computer gets the character shapes which are programmed into the character chip at the factory, so they are there as soon as you turn on. If you wanted a different default character set, a new chip could be programmed. Usually, this is not required — only to have different characters when needed.

Several locations are connected with changing character sets. The main one is 53272. There are others, but they do not need explanation until we come to deal with changing video banks.

Location 53272 is used to hold two things. The eight bits are treated as two half-bytes (nybbles). The high nybble (bits 4,5,6,7) holds the location of the screen in steps of 64. The bits 1,2,3 hold the location of character memory in steps of 2048.?PEEK(53272)AND254. If you have just turned on, it should be 20. Now print(PEEK(53272)AND240). The result is 16. Multiply that by 64 and you have 1024, the start of screen memory.

Now print(PEEK(53272)AND14). The result this time is 4. Multiply that by 1024 and you have 4096, which is the start of the area where the computer has an image of normal characters. The character sets start at multiples of 2048. To see the next 2K,POKE 53272,PEEK(53272)+2. The computer does this when you press SHIFT/Commodore key.

To use different characters, you need to store their patterns in a free area and then tell the computer that's where you want it to look instead of at its usual factory characters. Character sets can start at any address that is a multiple of 2048. In the first 16K (bank), these are 2048,4096,6144,8192,10240,12288 and 14336. To see the characters in sets starting at these addresses,POKE53272 with even values from 16+2 to 16+4. Use this small program to do it:

PROGRAM ONE

```
10 FORI=1024TO1063:POKEI,160:POKEI+54272,1:NEXT
20 POKE53272,20
```

Run it and press a key to change the value in 53272. Notice that as soon as you run it, some characters on the screen turn to rubbish. This is particularly apparent if you have had a program in memory before you typed the small program in. What is happening is that the video chip looks at numbers that made up a program (2048), then at the default set (4096), then at memory containing 0s and 255s (6144-14336). The place to put your new characters is in those higher addresses where they won't be affected by a program occupying memory at a lower address. Type this in. It's a program to copy the normal character set from ROM to RAM at 12288 to 14335. The loop is 2048 long because there are 256 characters of eight bytes each.

```
10 FORI=18TO38STEP2:POKE53272,I
20 POKE198,0:WAIT198,1:NEXT
30 POKE198,0:WAIT198,1:POKE53272,20
```

PROGRAM TWO

What you are seeing on the screen is the copying process. If you press SHIFT/Commodore, the lower case characters do not appear. To copy them as well, change the 2047 in line 50 to 4095. That shows you how characters are put into memory. To experiment a bit, change line 55 to 55 POKE 12288+1, 255-PEEK(53248+1): NEXT

The 8 x 8 grid of dots that make a character is a bunch of eight bytes, and the individual dots are bits in those bytes. Take the letter "A". In this example A'.' is an off dot, '•' is an on dot.

```
20 FORI=0TO255:POKE1024+I,I:POKE55296+I,1:NEXT
30 POKE53272,20
40 POKE56334,PEEK(56334)AND254:POKE1,PEEK(1)AND251
50 FORI=0TO2047
55 POKE12288+I,PEEK(53248+I):NEXT
60 POKE1,PEEK(1)OR4:POKE56334,PEEK(56334)OR1
```

PROGRAM THREE

When the computer prints an "A", the shape that appears on the screen is what the computer is told is an "A". But it can be any shape you have drawn for an "A". Say you wanted the letter "A" upside-down. To do this, you would need to change the numbers in memory *that make up the shape for a letter "A".* Character sets are put in RAM because the contents of RAM memory can be changed whereas ROM memory (which holds the factory shapes) can't.

In our case, the set starts at 12288. "@" is the first character and takes up eight bytes, so the shape for "A" starts at 12288+8=12296. To turn it upside-down, you need to reverse the order of the shape numbers. The shape numbers in our example are: 24,60,102,126, 102,102,102 and 0. To reverse them in memory, put them in data statements.

```
BIT 76543210
    ...##... BYTE1 CONTAINS 0+0+0+214+213+0+0+0      =24
    ..####.. BYTE2 CONTAINS 0+0+215+214+213+212+0+0  =60
    .##..##. BYTE3 CONTAINS 0+216+215+0+0+212+211+0  =102
    .######. BYTE4 CONTAINS 0+216+215+214+213+212+211+0=126
    .##..##. BYTE5 CONTAINS 0+216+215+0+0+212+211+0  =102
    .##..##. BYTE6 CONTAINS 0+216+215+0+0+212+211+0  =102
    .##..##. BYTE7 CONTAINS 0+216+215+0+0+212+211+0  =102
    ........ BYTE8 CONTAINS 0
```

PROGRAM FOUR

If you haven't POKED 53272,28, do it after running those two lines, and you'll see every "A" upside-down (it still functions as an "A" in keywords). Until next time, try different values in the data statements or POKEing the data into different addresses between 12288 and 14336 to change other characters. For interest's sake, here is a short machine-code routine that transfers every character from ROM into RAM of your choice.

```
70 FORI=0TO7:READCS:POKE12296+I,CS:NEXT
80 DATA0,102,102,102,126,102,60,24
```

PROGRAM FIVE

For those with a printer capable of re-defined characters (MPS802 or similar) here is a program I wrote to print out a character set between two addresses. It prints the character followed by the eight numbers that comprise the character. Each character takes about 2.5 seconds to process, because it has to be mirrored and rotated 90 degrees to be correctly orientated when it reaches the print-head. This is the bones of a larger program I use in my editor.

```
10 FORI=0TO60:READMC:POKE49152+I,MC:NEXT
20 INPUT"START OF CHAR SET";SS
25 IFSS<40960ORSS>14336THENPRINT"□□":GOTO20
30 POKE49174,SS/256
35 POKE53272,(PEEK(53272)AND240)+(SS/2048)+2
40 SYS49152
50 DATA173,14,220,41,254,141,14,220
55 DATA165,1,41,251,133,1,169,0,168
60 DATA133,252,133,254,169,48,133,253
65 DATA169,208,133,255,177,254,145,252
70 DATA200,208,249,230,253,230,255
75 DATA165,255,201,224,208,239,165
80 DATA1,9,4,133,1,173,14,220,9,1
85 DATA141,14,220,96
```

PROGRAM SIX

Character and sprite editors are available in public domain, or alternatively through retailers.

```
5 OPEN1,4:OPEN4,4:OPEN5,4,5
10 FORI=0TO7:READM(I):NEXT
15 DATA128,64,32,16,8,4,2,1
20 INPUT"START ADDRESS";SA
25 INPUT"END ADDRESS  ";EA
30 NA=INT((EA-SA)/8-1):NA=900
35 FORC=0TONA
40 FORI=0TO7:AR=PEEK(SA+C*8+I)
45 FORJ=0TO7:BI=-((ARANDM(J))>0):A(I,J)=BI:NEXT:NEXT
50 FORJ=0TO7:FORI=0TO7:T(J)=T(J)+A(I,J)*M(I):NEXT:NEXT
55 FORI=0TO7:POKENA+I,T(I):T(I)=0:NEXT
60 GOSUB100:NEXT:CLOSE1:CLOSE4:CLOSE5:END
100 A$=""
105 FORPR=0TO7:P(PR)=(PEEK(SA+C*8+PR))
110 A$=A$+CHR$(PEEK(NA+PR)):NEXT
115 PRINT#5,A$
120 PRINT#4,CHR$(14)CHR$(254)CHR$(15)CHR$(160)CHR$(160);
125 FORI=0TO7:PRINT#1,P(I);:NEXT:PRINT#4
130 RETURN
```

More BASIC tips

by Graeme Fleming

In my last article for Commodore version two (and beyond) BASIC users, I presented some useful methods of string and variable handling. Ending the article was a simple, but very slow perfect numbers program. I hope some advanced hackers "complicated" it enough to increase its speed while processing higher numbers (clue: POKE the number to be checked and CLEAR the variables) A look in a dictionary or encyclopedia under numbers can spark off many programs which can be left running overnight.

ABS, SGN and *-1 are three helpful hands to the BASIC programmer when it comes to the algebra or formula of a program. The ABSolute value of a number is its value as a positive, see example program one. The SiGN of a number, often expressed as SiGNum, to avoid confusion with the SINe of trig., tells whether it is positive, negative, or null. This makes the SiGN of thirty-two; one, the SiGN of negative seventeen; negative one and the SiGN of zero; zero. Example program two shows this clearly. While *-1 is part of an expression rather than a function-numeric keyword, it has a similar effect to ABS. Using (x=y*-1:y<0), x will always be the positive of y, but if y>0, x would always be the negative of zero. All the confused can refer to example program three for a simple explanation.

Binary is the way a computer counts in machine code and BASIC is a machine code program which uses words that we understand (eg. print, input, go to, read) and counts in base ten, ie. 1,2,3,4,5,6,7,8,9,10. . . Binary isn't much use to Joe Blow the BASIC programmer (that's you) but let's look at it anyway.

Binary

People used to count in base ten because they all had ten fingers. Let's go back to creation, giving men eight fingers. We would then count in base eight, ie. 1,2,3,4,5,6,7,10. . . Example program four shows a few more possibilities, including base two, more commonly known as binary. Each digit of binary is known as a bit. One bit can equal either zero or one, often called off and on, or low and high. Computers remember them in their "RAM" and "ROM" (or their memory) as a small or large charge of power.

You don't have to be a mathematician to see that one bit can't count very high at all. For this reason we group them together, much as we do base ten. A group of four bits is called a nybble, eg. 1011 or 0110, but that only gets you 16 combinations (0 to 15, or in binary 0000 to 1111). Computers with "eight bit microprocessors" put two nybbles together to make a byte, giving a range from 0 to 255, or in binary 00000000 to 11111111 (often written 0000 0000 to 1111 1111). Example program five counts to 255 in binary and decimal (another name for base ten). Computers with 16 and 32 bit microprocessors use bytes with 16 and 32 bits respectively. Those in or near confusion corner may skip the next paragraph.

By now some of you are probably thinking how painstaking binary must be for the machine code programmer. For this reason we use base sixteen, or hexadecimal (oh no, not another base!). RUN example program six and see if you can see why. Notice how we use the alphabet above nine.

The FRE function works well on the Vic-20 giving the number of bytes free but because of the larger memory on the 64, it usually results with a negative. When this happens, adding 65536 to the number will return the correct answer. Typing the following will have an infallible result.

PRINT FRE(0) —
(FRE(0) < 0) * 65536

Note: The value in parentheses, in the above case zero, following FRE is called a dummy variable, as it doesn't affect the outcome, but must be there. Dummy variables and strings are encountered from time to time in high level languages like BASIC.

Program One

```
10 REM *** EXAMPLE PROGRAM ONE ***
20 FORA=-9TO9
30 PRINT"ABS("A") ="ABS(A)
40 NEXTA

READY.
```

Program Two

```
10 REM *** EXAMPLE PROGRAM TWO ***
20 FORA=-9TO9
30 PRINT"SGN("A") ="SGN(A)
40 NEXTA

READY.
```

Program Three

```
10 REM *** EXAMPLE PROGRAM THREE ***
20 FORA=-9TO9
30 PRINTA"*-1 = "A*-1
40 NEXTA

READY.
```

Program Four

```
10 REM *** EXAMPLE PROGRAM FOUR ***
20 FORA=10TO2STEP-1
30 PRINT"BASE"A":";
40 FORB=0TOA-1:PRINTB"";
   :NEXTB:PRINT10
50 NEXTA

READY.
```

Program Five

```
10 REM *** EXAMPLE PROGRAM FIVE ***
20 FORA=0TO255:B=A
30 PRINTB"=";
40 IFB<128THENPRINT0"";
50 IFB>127THENPRINT1"";:B=B-128
60 IFB<64THENPRINT0"";
70 IFB>63THENPRINT1"";:B=B-64
80 IFB<32THENPRINT0"";
90 IFB>31THENPRINT1"";:B=B-32
100 IFB<16THENPRINT0;
110 IFB>15THENPRINT1;:B=B-16
120 IFB<8THENPRINT0"";
130 IFB>7THENPRINT1"";:B=B-8
140 IFB<4THENPRINT0"";
150 IFB>3THENPRINT1"";:B=B-4
160 IFB<2THENPRINT0"";
170 IFB>1THENPRINT1"";:B=B-2
180 IFB<1THENPRINT0
190 IFB>0THENPRINT1
200 NEXTA

READY.
```

Program Six

```
10 REM *** EXAMPLE PROGRAM SIX ***
20 PRINT" DEC","HEX","BIN"
30 A$="0123456789ABCDEF"
40 FORB=0TO15:D=B
50 GOSUB80
60 PRINTB,MID$(A$,B+1,1),C$
70 NEXTB:END
80 C$=""
90 IFD<8THENC$=C$+"0"
100 IFD>7THENC$=C$+"1":D=D-8
110 IFD<4THENC$=C$+"0"
120 IFD>3THENC$=C$+"1":D=D-4
130 IFD<2THENC$=C$+"0"
140 IFD>1THENC$=C$+"1":D=D-2
150 IFD<1THENC$=C$+"0"
160 IFD>0THENC$=C$+"1":D=D-1
170 RETURN

READY.
```

ML Comparisons

If it's wet it's raining

by Joe Colquitt

There are a number of instructions associated with testing memory conditions, loops etc., all of which concern the status register (P), which has its bits arranged thus (bit 7 to bit 0); NV * BDIZC, corresponding to negative, overflow, (* unused, logig 1), break,decimal,interrupt disable,zero, and carry.

The instructions which use the status register are in three groups.

1) Compare: CMP,CPX,CPY,BIT

These compare a memory byte, the accumulator or an index register against a value and are usually followed by a branch instruction. As typical examples;

This example will print out the message held at $C010-$C024. The counter runs from 0 to #$14, with the BNE being ignored when X=#$15

2)BRANCH: BEQ,BNE,BPL,BMI,BCC,BCS,BVC,BVS

These all test particular bits of the status register, which are affected by comparison instructions. BEQ and BNE have been demonstrated, and are virtually interchangeable in most cases, ie. either a value is zero or it isn't. The same reasoning applies to the other branch instructions.

BPL and BMI can be used to test the magniture of a comparison result. For example:

Bit 7 of (P) can also be used to determine if a number is negative or positive in the range -128 to +127. For example, if the binary representation of a byte's contents was 10001001, because bit 7 is set, the byte could be interpreted as containing -9. If the N flag was not considered, the byte would be construed as holding +137. If the bit pattern was 00110010, the byte could be interpreted as containing +50. It all depends on whether bit 7 is taken into account.

BCC and BCS are used to test the carry flag, often after arithmetic operations. The carry flag is set by a byte incrementing past 255, shifts, and comparisons. Shifts wil be dealt with fully in the mathematics topic. A compare will set the carry flag like this:

C000 CPX#$25
Sets the carry flag if 25<X>255
Clears the carry flag if 0<X>24

BCS and BCC can be used in a similar vein to BNE and BEQ, ie. almost interchangeable. This small routine adds 10 to a byte, and increments another byte if the first exceeds 255.

Here's a basic program to use this routine:

BVC and BVS test the overflow bit (6) of the status register. As in the previous 'bit' example, it can be used to test bit 6 of a byte.

C000 BIT$3400 ;TEST BIT 6
C003 BVS$XXXX ;IF BIT 6 = 1 then branch

The primary use of the overflow flag is to test for 'two's complement' overflow. This occurs when a number less than -128 results from a procedure. Because an 8-bit byte can only hold -128 to +127,. the flag is used to determine the true sign of a result. Unfortunately, it would hold up the flow of things considerably if I attempted to explain every facet of each instruction, so I'll come back to these areas at a later date. Some will be included in other topics, so please be patient.

3) DIRECT ACTION :SEC,CLC,SED,CLD,SEI,CLI,CLV

'Set carry' and 'clear carry' have been covered. 'SED' is set decimal, used to work in decimal mode. This is particularly helpful when numbers are inputted and outputted and is most effectively used where minimal calculations are required. When 'SED' is performed, the computer is forced to operate in what is known as 'binary coded decimal', and it works like this.

Say you had 9 in a byte. In binary representation, it looks like 00001001, or hex 09. If you add 1, to make 10, it becomes 00001010, or hex 0A. That 0A doesn't look like 10. Now if decimal mode is enforced, binary 00001001 +1 =00010000, or hex 10. Now it does look like the 10 that we are familiar with. The computer is told to treat the high nybble as 10's, not 16's, as is usual. This makes number storage less efficient, because a byte can now only hold 99, instead of 255, but the outputting becomes so much easier. To print the contents of a byte now, the two digits need to be extracted and converted to ASCII. This all sounds complicated, but it's a lot easier in practice than it looks.

'Set interrupt' and 'clear interrupt' are used mainly when resetting interrupt vectors. During the normal course of events, every 60th of a second the computer breaks from whatever it is doing, and does its 'housework'. This entails such things as updating the timer, the cursor, the screen or scanning the keyboard. However, you can make it perform a task for you before it does these things, and that is where changing the interrupt vector comes in. If you peek(788) and peek(789), you find the address$EA31, the normal interrupt address. A routine like the next will allow you to break in.

Use SYS49152 to activate the new interrupt. A routine to restore the original interrupt would be similar to $C000-$C00C. Stop/restore will do it too. Any attempt to change the vector without disabling the interrupts will make your machine throttle itself. More uses for all of these instructions to come.

Anyone who would like a copy of the public domain monitor 'Supermon' + instructions for the C-64, please send me a tape or disk and a stamped return envelope. Joe Colquitt, 6 Martin Ave, Mt Albert, Auckland.

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