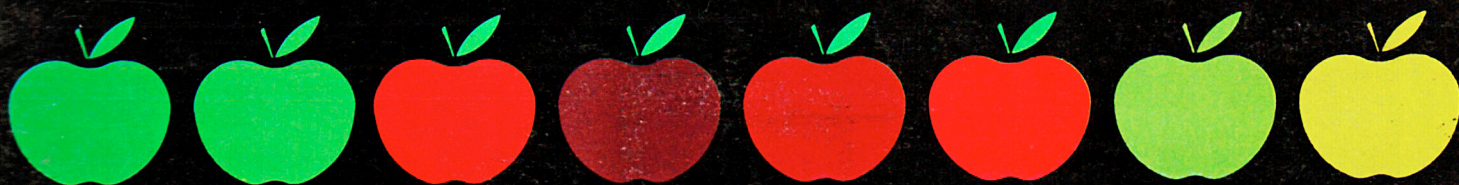# The Australian
Apple Review

The
ten
best
games?

Mac+II
preview

Apple Assembler

Sidekick
Macintosh helper

**Custom ProDos Clock
Driver**

Fantavision
graphics and animation

*Recommended retail price

The essential accessories they forgot to give you

Acquiring a Macintosh is an unalloyed delight. When you take it home you are desperately eager to start using the world's best personal computer - straight away.

Which is when you find out about the essential accessories they forgot to give you.

Now, XL provides all of those essential accessories in one elegantly packaged starter kit.

APPLE IIe, IIc VERSION NOW AVAILABLE

XL Starter Kit - the total accessory kit to start you off on the right foot. *The* essential accessory for your Macintosh.

* To record the information you are going to write - two blank disks, ready to be formatted. * To give you programs to work with from moment one - a disk full of public domain programs. * To help you with those first faltering nervous steps - a starter cassette full of helpful information. * To keep your Macintosh sparkling clean and free from static - a spray can of CompuFoam, a specially formulated foaming cleanser with anti-static properties. * To keep a refined and subdued gloss on all your machinery - a spray can of specially formulated AntiStat Sheen. * Plus special cleaning tissues. * And ten foil packets of sealed anti-static screen cleans. * A mouse mat. Anyone who has wiggled their way to desperation with a recalcitrant mouse on an inhospitable surface will tell you how important *that* is. * A slab of perforated edge printing paper to get your printer up and running - straight away. * A folding disk holder. * A special document case with note pad in which you can keep a log of your operations.

XL COMPUTING PTY LTD No 3 Little Queen Street, Chippendale 2008. Tel (02) 319 2844
Trade enquiries welcome

The Australian Apple Review

Vol 3 No 4 April 1986

Contents

Editorial

AT LONG LAST we can say quite firmly, with no equivocation and without fear of contradiction, that there will be a new Apple II. And there will be a colour Macintosh. Both from Apple. Both in the next few months.

Normally, any magazine or journalist who makes that sort of prediction before the official announcement is simply asking for trouble. The gossip mills about Apple were always industrious, their product not always genuine.

But this time we have hard concrete evidence.

One. We have talked at length to a member of staff who has been present at the trade shows in Cupertino, California, where the new Macintosh has been shown to the eager staffers so they could know the direction that Apple is travelling. They were not shown mock-ups of a maybe machine. They were shown the real thing, operating.

Two. We have talked to several Macintosh programmers who work on their own account and also do contract work for Apple. They have all been told their programs must have colour capability built in and they have been given the exact method and parameters to achieve this miracle.

Three. We have talked to programmers in the United States who have already been issued with the new 16/8 bit Apple so their current programs could be modified to fit, and their new programs could make use of this availability of power and memory.

Four. We have seen two mock-ups of the new machine - one with detachable keyboard, one fixed - which were shown to leaders of the European market for their evaluation several months ago.

Five. Both John Sculley and Delbert W. Yocam have stated publicly this is the year the Apple II gets a new central processing unit.

These are not straws in the wind. These are facts - provable, demonstrable facts.

The only fact we have not been able to lay our hands on is the exact date of the launch of these new machines. The most probable date suggested is August.

It is almost certain that Apple management will not wait until next February for the announcement, considering that Atari with the 500ST, Commodore with the Amiga and IBM with the JX are snapping at their heels. In the United States the Christmas trade has an importance which is difficult to understand in Australia. In the States the Christmas market can make or break a home computer company. Therefore it seems most likely Apple will try to be ready to attack that market with these new models. If that is the case they have a deadline somewhere around the end of October for their launch date if they are going to get the cream of the sales, and the earlier the better.

Our guess - based on leaked evidence we have to hand - is the date will be August, which gives them plenty of time to get a stranglehold on those Christmas sales. Read *The Australian Apple Review* for further news ⌘

Bits and Bytes

Starter Kit for the Macintosh

Jacqueline Joubert is a nice lady who has been involved with Apple programs and accessories for some time. Now she, with partners, has started a new company called XL Computing Pty Ltd to handle Mac accessories. Their office is in a splendidly renovated old church in Ultimo. The first product is just as splendid.

When you buy your first computer, you are desperate to get it home and make the damn thing work. Having laid out all that money your fingers are itching to start writing programs, penning the world's greatest unpublished novel, creating art that would have made Picasso weep, hopefully with envy.

And you find you cannot do that easily because you are missing all the lots of bits and pieces that make you comfortable with a computer.

What the XL kit does is supply that need. In one of the most attractive computer packages seen around in many a long day is assembled a wide range of useful mini accessories. Like a couple of blank disks, a disk of public domain software, a training cassette, cleaning materials, printing paper, folders for holding information and disks and other jolly things. This is the sort of accessory which will ease the path, oil the wheels, of anyone acquiring a new Macintosh.

The best accessory in the pack is a mat for the mouse to run on. It makes using the Macintosh twice as easy and half as aggravating.

Further information from XL Computing, (02) 319 2844.

Symbiotic upgrades

Symbiotic Computer Systems is upgrading its product line to ensure

Starter Kit for the Macintosh from XL Computing

compatibility with the Macintosh Plus.

The company said it has already begun shipping new versions of its *Last Accounting* program which is totally Macintosh Plus and ImageWriter II compatible, and would begin shipping new versions of its HyperDrive and HyperDrive 20 internal hard disks in April.

Two other newly-announced products in the HyperDrive family, a file server software package called *Hypernet* and HyperDrive 2000, a high-performance coprocessor board with an internal hard disk drive, will also work with the new Macintosh Plus. The MacCharlie Plus is also expected to be shipped in April.

"The Macintosh has been upgraded in ways that are particularly important to serious business and professional users," said Dr. Helmut Imberger, Symbiotic Managing Director. "These users make up our largest market, so it is essential for our products to support all the performance enhancements that Apple now offers."

"In addition, Apple's decision to add to the capabilities of Macintosh complements our own development

strategy. We recognised almost as soon as the Macintosh appeared that many people would require tools which advanced the machine's productivity and throughput, hence our support of products such as HyperDrive and *Last Accounting*. Now that users are beginning to look for more memory, more speed and networking capabilities we are upgrading and expanding our product line."

Symbiotic has also announced three new products which reflect the company's emphasis on advanced technology:

HyperDrive 2000, a high-performance co-processor board and 20-megabyte internal hard disk drive theat Imberger said "turns the Macintosh into the most powerful personal computer on the market today." HyperDrive 2000 includes an additional 1.5 megabytes of random-access memory, a 12 MHz 68000 microprocessor that effectively doubles the internal processing speed of the Macintosh, and a 68881 floating point coprocessor for high-speed numerical calculations.

According to Craig Winkler, Symbiotic's Product Manager, a Macintosh or a Macintosh Plus equipped with HyperDrive 2000 can handle a variety of applications that often exceed the capacity of most personal computers - artificial intelligence, computer-aided design and engineering, scientific and statistical analysis, electronic publishing, animation, accounting and business modelling - and dramatically improve the usefulness of many conventional programs, particularly accounting programs, large spreadsheets and relational databases.

HyperNet, a file server software package that enables users to link as many as 32 Macintosh computers together as part of an *AppleTalk* network. Based on a system of distributed file storage, *HyperNet* gives network participants access to files, program and hard-disk storage capacity located anywhere on the network.

MacCharlie Plus, a new version of the MacCharlie coprocessing workstation which includes a dual 5.25" disk drive, 640K random-access memory and additional function keys. Compared with the original MacCharlie, MacCharlie Plus offers doubled screen refresh speeds, the ability to work with Apple's Switcher program, and upgrade paths including an internal or external hard-disk drive and an expansion chassis.

These three new products, as well as ongoing software and hardware upgrades for existing products, will be distributed exclusively through Symbiotic to authorised Apple dealers throughout Australia, New Zealand and Papua New Guinea.

Further information from Symbiotic Computer Systems, (03) 836 4482.

New educational software

Several new educational software products for the Apple II are now available from Prologic, the largest producer of educational software in Australia.

These include:

On the Move - a tool for the student to understand the physical laws of motion.

Gapmaker ... Gaptaker - addresses the need for computer education materials to link theory, classroom activities and the computer together.

What Chemical is That? - provides a database and a problem solving tool that allows the student to explore the nature and linkage between over 100 inorganic chemicals.

Geologist at Work and *Geological History* - allow the student to model various possible events in the formation of cross sections of the earth's crust.

Standing Room Only - an animated display showing population trends over a 100 to 150 year period, including birth and death rates and age/sex distribution.

Working with Words - a Thesaurus Generator - allows individual students,

groups of students, classes or even whole schools to build databases of words that are important to them.

We hope to review some of these programs in our next issue.

For further information, Tim James, Prologic, (03) 429 3188.

Fantavision

Broderbund's *Fantavision*, now available from Imagineering, allows virtually anyone - artists and non-artists, children and adults - to create cartoons, special effects and animated "movies".

Fantavision is available for the Apple II+, IIe and IIC. It works with most Apple II peripherals, including the mouse, KoalaPad, Apple Graphics Tablet and joystick.

See our review on page 12.

Haba *Quartet*

Haba *Quartet* and other Haba software is now distributed by Cybernetic Research Ltd in Melbourne.

Haba *Quartet* is an integrated spreadsheet which runs on the 128k or 512 k Macintosh, featuring simultaneous operation of spreadsheet and graphics combined with database and text editing capabilities.

It was reviewed in *The Australian Apple Review* July 1985 issue, Vol 2 No 5.

Further information from Cybernetic Research Ltd, PO Box 24, Hawksburn, Vic 3142, telephone (03) 529 4844.

Typesetting and graphics

In this issue we have another article on desktop publishing using the Macintosh and the LaserWriter, which we consider an extremely useful way to get typesetting done quickly and cheaply for in house publishing.

If you have a Macintosh but don't have a LasérWriter, or even if you have an IBM, and would like to use the facilities of the LaserWriter, there are several companies now who can do

this for you.

The Creative Computer Co in Hurstville, NSW, is a good example.

The advantages of computer graphics and typesetting are that the speed and quality are excellent, and corrections are very fast and simple.

What takes a week or so to do with conventional typesetting can be produced within 24 hours.

They can take your Macintosh disk and turn your company reports, balance sheets, newsletters, etc into elegant typesetting in a wide variety of fonts, printed out on the LaserWriter.

They can design the page layouts for you and incorporate graphics and line drawings.

They can also download from IBM and Apple II disks.

They offer an instant graphic service ; simple business cards and letterheads can often be created while you wait, naturally it takes a few hours for logos and artwork.

For further information, Creative Computer Co, (02) 570 8300. 123 Forest Road, Hurstville, NSW 2220.

Shiny new Apples for Sale?

IT IS NOW SEMI-OFFICIAL.

There will be a new colour Macintosh launched this year.

There will be a new 16 byte Apple.

We have suggested the possibility in previous issues but now we can confirm it is so. Let's take them one by one.

Colour Mac

The new Macintosh will have, among other improvements, a colour screen. This Macintosh has already been demonstrated by Apple staff members in a series of product shows in Cupertino.

Apple has now grown so large that, in order to keep all employees informed as to what they are doing, they have to hold trade shows which in size and number of attendees rival some of the computer shows in Australia.

We know the colour Macintosh was shown just a few weeks ago because, amazingly, a complete stranger managed to get in. He was visiting Cupertino at the time and was talking to a friend of his who was working for Apple. The friend said there would be a trade show that night for Apple staff members. He took careful notice of the address and turned up at the required time and was allowed in. And there he saw the colour Macintosh.

At the same time it is worth noting that every programmer working on an Apple Macintosh development has had a confidential memo saying that all programs have to be written with colour capability built in. That has been enforced since the beginning of this year.

The machines that were demonstrated were production line machines, which means that Apple must be very close to launching them. How close?

The best information we have is that they will go into full scale production in July. Which means they will be launched to an eager and expectant world in either August or early September. But without doubt this year.

Everyone who had dreamed of having their Macintosh in colour direct from Apple can now rejoice. It is quite definitely going to happen. And it is quite definitely going to be soon.

New CPU for Apple II

The situation with the Apple II is even firmer. Both John Sculley and Delbert Yocam have stated that this is the year the Apple II will get a new central processing unit.

The new CPU will replace the now venerable 6502, which is of course an 8 byte chip. The new chip is a 16/8 byte chip which is almost totally compatible with all earlier Apple programs.

It will run at 4 megahertz and will give a completely new lease of life to the Apple II. Expect this to be announced at the same time as the colour Macintosh.

Detachable keyboard?

The information on the new chip is quite firm. What is not firm is whether the new Apple will have a detachable keyboard or not.

Note that in many countries in Europe it is illegal to use a computer in an office situation if the keyboard forms an integral part of the computer. It is felt that a non-detachable keyboard is ergonomically unsound. Therefore, to be accepted in offices in Europe, the Apple II has to have a detachable keyboard in the same way as the Macintosh does.

Because Apple has never considered the rest of the world outside the US a major market we would have said they would have ignored this requirement. But now that Jean Paul Gassee is now in charge of product development - Gassee is the ex-head of Apple in France - it seems fairly certain he will ensure that the machine is totally acceptable in Europe. Which means there will be a detachable keyboard.

Mouse

It is probable that the new Apple II will also have a mouse.

The reason for this is simple. All of the best new business programs which have been produced - specifically those coming from Luc Bartheleq - require the use of the mouse.

It is true you can fit a mouse using a board in a slot of the current Apple. But that is not the ideal solution. The mouse as an integral part of the machine is not difficult to fit. Look for it on the new Apple.

Hi-res screen

Finally, the new Apple II is going to have a very much higher resolution screen.

The most probable resolution is the 316 by 400. This is very high resolution indeed - equivalent to the IBM when it is fitted with the Hercules colourcard. When you have this sort of resolution you can use a colour monitor for word processing and for spreadsheets.

There is a strong move in the business to insist on the use of colour monitors because theoretically they lower the possibility of eyestrain and at the same time, keep the work interesting.

No colour monitor can easily work with the Apple II and produce letters and figures which are sharp and clear. Hence

the increase in resolution.

This new Apple ll will give the machine on which the fortunes of Apple were based a new lease of life.

But there are even greater developments in the pipeline.

Apple have already commissioned work on a new, true, 16 byte chip which is totally compatible with the 6502 and with its new replacement. This chip will run at speeds up to 10 megahertz which will make the Apple ll as fast a personal computer as any on the market today.

One direction Apple is definitely travelling in is to only use proprietary central processing units. Then they will have no problems with pirates. (If pirates can't get the chips they can't build the machines.)

When will this machine be available? The situation at the moment is that the chip is being tested and debugged. This is a far longer process than debugging a software program and it is unlikely that this chip will be commercially available until, at the earliest, the first half of next year.

Nevertheless, there seems little doubt that Apple will embrace the chip because it will give the Apple II another 10-15 years of life. It will also keep all the hundreds of thousands of Apple II fans around the world extremely happy, because their original programs will still be usable on this upgraded superpower superfast machine.

The only question that occurs to us is what are they going to call it.

Not Apple 3 surely? 🍎

At last - Apple II will speak peace unto Macintosh

MOST MACINTOSH fanatics were originally Apple fanatics. And their love of that machine still carries on. While it is true that the amount of software for the Macintosh has increased by leaps and bounds over the past few months, the programs available, in quantity, are not within cooee of the programs available for the Apple II.

And we thought that was the way the world went. Those were the breaks. That was the way the cookie crumbled. And we were wrong.

For now a young American called David Hemmo, in co-operation with another programmer, Marc Moini, has written a program, *Mac+II*, which allows a Macintosh owner to use any of the Apple II programs.

This is not a lash up full of ifs and buts. As far as we can ascertain this is the genuine article, which will increase the availability of Macintosh programs by several thousand per cent, overnight.

Note: this is a software solution. It is not like *MacCharlie* where, effectively, two computers are welded into one to allow the Macintosh to use IBM PC software.

With *Mac+II* you merely load the emulator program into your Macintosh, transfer the programs you want over to suitable disks and then you are in business.

Mac+II only became available in Australia on the morning we were putting this magazine to press. We had very little time to play with it, to test it for bugs, to see whether it worked as claimed. But what we did see assured us that here was an emulator which would simply, quickly and easily make Apple programs operate on the Macintosh.

The manual that comes with the program is slapdash and makeshift and contains several spelling errors. But it does show exactly how the program works, it does lay out all its strengths and weaknesses.

To give you a first taste of *Mac+II* here is a severely edited and truncated version of the manual. Next month we will have a full test of the program ready for your interest and information.

From Mac+II manual

Mac+II is an Apple IIe or Apple II+ emulator for the Macintosh. It turns the Macintosh into an Apple IIe or Apple II+ with up to 128k of RAM, 80 column display, built in serial interface, 3.5" disk drive and 68000 extension card. The exact configuration depends on the type of ROM you decide to install in the emulated machine. *Mac+II* opens to Macintosh users most of the library of programs available for the Apple II computers.

Mac+II (V3.0) operates on a Macintosh with at least 512k of RAM. UniDOS is the disk operating system used by *Mac+II*. UniDOS is an adaptation of the standard Apple II DOS 3.3 that works with 3.5" disks and Unidisk 3.5. *Mac Com* is the communications program that allows *Mac+II* to receive files and programs from an Apple II.

Mac+II is written by David Hemmo. UniDOS is written by David Hemmo and Marc Moini. *Mac Com* is written by Marc Moini.

Power on or RESET the Macintosh. Insert the *Mac+II* disk internal drive.

The code in the Apple II ROMs is copyrighted by Apple Computer Inc. Apple Computer Inc does not license this code except to Apple II owners. You have to transfer this code from your Apple II into your copy of *Mac+II* the first time you use *Mac+II*. *Mac+II* will ask if you want to transfer Apple II ROMs. Click on OK. You will then be presented with a dialog box asking you to connect your Macintosh to an Apple II. Choose TRANSROM from the menu shown. Then click OK on the Macintosh (or CANCEL to go back to the Finder) and follow the instructions on the Apple II screen to make the transfer. Your Apple II ROMs (all except Apple IIc ROMs) will be copied and installed into *Mac+II*, which will then launch itself.

Mac+II finishes loading and ejects its disk. From then on, and until you exit *Mac+II*, your Macintosh behaves just as if it were the Apple II from which the ROMs were transferred.

Mac+II creates disks that are on the Apple II format and logic.

Mac+II does not support a hard disk.

KEYBOARD:

There are a few differences between Apple II and Macintosh keyboards. The table shows the correspondence for special Apple II keys on a Macintosh.

Apple II	Macintosh
ESCAPE	'(top left key)
->	] or Command - S
<-	[or Command - A
Down arrow	Command - D
Up arrow	Command - F
[	Shift - [
]	Shift -]
{	Command - [
}	Command -]
CTRL	OPTION KEY
Reset	Command - Backspace
Open Apple	Enter key
Solid Apple	Mouse Button
Restart	Command-Option-Backspace

PRINTER:

If you have an ImageWriter printer connected to your Macintosh, you may use it. *Mac+II* emulates a printer card in slot 1. From BASIC, type PR#1 to enable the printer. Type PR#0 to disable it.

You may type lower case characters on the keyboard (with the Caps Lock key in the UP position), but depending on the ROMS you transferred, these may or may not be turned into upper case characters before being used.

DISK DRIVES:

Under *Mac+II*, a Macintosh disk drive is seen as a Unidisk 3.5, with either 400k or 800k capacity, depending on your disk drive.

Mac+II emulates all the protocol converter calls except the ones concerning program execution in the drive's internal memory. This means that copy-protected software for the Apple II that resides on 3.5" disks may not work under *Mac+II*.

MODEM PORT:

Mac+II partially emulates a Super serial Card in Slot 2, corresponding to the Modem port of the Macintosh. This card is limited to baud rates higher than 300 and lower than 9600.

80 COLUMN CARD:

If you have transferred Apple IIe ROMs into *Mac+II*, a 80-column display card is available in slot 3. Type PR#3 to enable it.

RAM:

There is a total amount of 128k of RAM available for use by the emulated Apple II. Please note that you need to install Apple IIe ROMs to be able to access the 64k of auxiliary memory. You are limited to a total of 64k with Apple II+ ROMs, which means you have a 16k card built-in to start with.

MOUSE:

Joystick and paddles are replaced by the Macintosh mouse under *Mac+II*. The ENTER key is the second button.

UniDOS:

UniDOS is a patched version of Apple Computer Inc's DOS 3.3 for 3.5" disks of Apple II or Macintosh, allowing access to the 400k/800k bytes of the 3.5 disks.

UniDOS divides a 3.5" disk into 400K volumes; on a 400K drive, one volume D1, on a 800K drive two volumes, D1 and D3. (resp. D2 & D4 for a second drive). The only operation which differs from DOS 3.3 is the INITialization of a 3.5 floppy disk.

Mac Com:

Mac Com is a program to transfer software from an Apple II to another Apple II through "Super Serial Card"s, using modems or a direct connection. Communication from an Apple II to *Mac+II* is made possible through an Imagewriter 1 cable connected on one side to a "super serial card" or a modem and to the modem serial port of Macintosh on the other side.

With *Mac Com* you are going to transfer programs from 5.25" disks to 3.5 disks. The 3.5 disks need to be initialized by the Macintosh finder if they are blank.

Mac+II and UniDOS are loaded onto your Macintosh. Insert *Mac Com* disks in the Apple II and the Macintosh. Type BRUN MAC COM<CR> on the Macintosh and PR#6<CR> on the Apple II. *Mac Com* asks which is the receiver and which is the sender.

To select a file, use the Return key or the space bar, an hyphen appears to the left of the name of the selected files. Press the D key (for "Done") to initiate the transfer.

Mac Com will transfer the files, displaying at both end each file's name and the number of sectors (256 characters) remaining to transfer.

Program Configuration

When you Brun Mac Com, an information window reading the Mac Com version appears. Press the space bar and a configuration window appears. You are now going to set up the program for transfer.

Communications slot:

Press any key. Enter the slot number of your communications card. On MAC+II or an APPLE IIc, enter 2 to use the modem serial port. MAC COM also supports modem interface cards for the Apple II. Adaptation for the HAYES Micromodem II and the NOVATION Applecat II is underway. (See "Important notes" on the MAC COM disk for more information).

MODEM:

If you are using a HAYES Micromodem II or a NOVATION Applecat II modem, MAC COM will display additional messages to keep you informed of the status of the communications (See "Important notes" on the MAC COM disks).
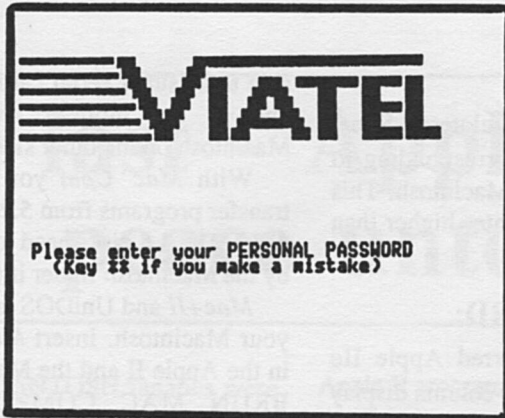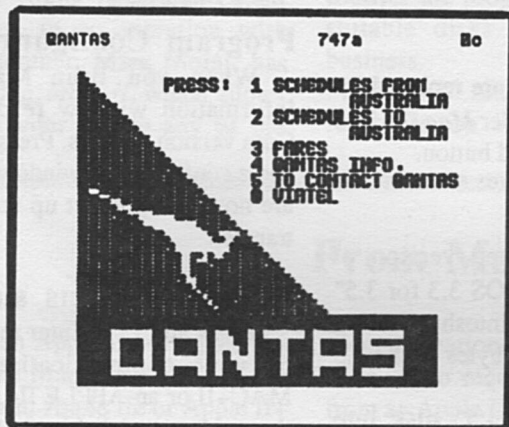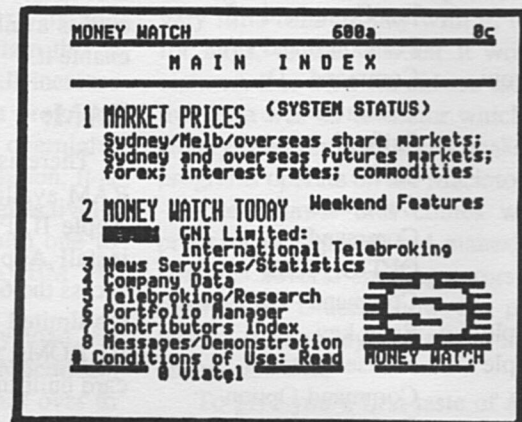
At the terminal
Problems with communications
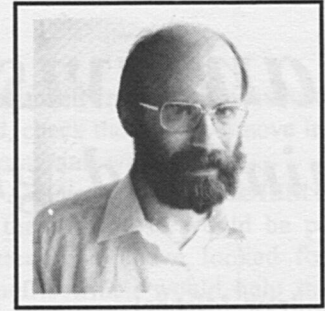
by Paul Zabrs

EVEN THOUGH communicating with microcomputers is becoming very common, it may still be quite daunting for the novice if he strikes problems.

Few things are more disappointing than when, after spending several hundred dollars on peripherals, you turn everything on and nothing happens. The tendency is to try several times and, if the system still does not work, to give up in frustration and anger for having spent all the money.

Provided you have good equipment, there is no reason it should not work. Of course, there is always the possibility of faulty equipment, but in my experience this is rare. The failure to communicate properly has usually a simple cause.

Maybe the cable?

The most common problem is in the cable connecting the computer with the modem. The usual manifestation of such a problem is that you are unable to communicate with anything at all. Fortunately, it is practically impossible to cause any damage to either the computer or anything else by using an improperly configured cable. Things simply won't work until the cable is right.

What do you do then? With most modems only three of the 25 pins of the usual DB25 connector need be connected, namely pins 2, 3 and 7. Pin 7 on the computer side is invariably connected to pin 7 on the modem side. Because of lack of standardisation, depending on the interface card and modem, pins 2 and 3 are sometimes connected to their equivalent pin numbers on the other side, at other times they are crossed, i.e. pin 2 is connected to pin 3 and pin 3 to pin 2. To test the theory of the wrong cable, simply cross pins 2 and 3 on one side and try again.

Another point is that with the CC7710 card pins 4, 6 and 20 should be shorted on the card side.

Data format

Another common problem involves the selection of data format. Most remote computers are happy with 8 data bits plus one stop bit. However, some require a specific data format, e.g. 7 data bits, 1 parity (even or odd) bit plus one stop bit, otherwise they will not acknowledge what you are typing. To rectify the problem it is simply a matter of setting the software to the required data format.

Half and full duplex

The problem of half and full duplex is common and usually trivial to solve. When full duplex communications is required and you are set for half duplex, all you type appears on the screen twice. No harm done, just switch the software to full duplex. If you are in full duplex and the host requires half duplex, all your typing is invisible. To rectify the situation, simply switch to half duplex.

Remote services

When connecting to remote services such as mainframes, bulletin boards, Viatel etc, your modem should always be switched to ORIGINATE mode. If, on the other hand, you are trying to establish a link with a friend with a similar system to yours, it is essential that one of you be in originate mode and the other in answer mode. That's what the modem switches are for. It does not matter which side is which, provided there is one of each in a communications link. Almost all remote services are always in answer mode.

I have concentrated on problems with easily rectifiable causes. There is one problem with the older Apple //c's (purchased prior to December 1984) which manifests itself in intermittent garbage on the screen and is not amenable to any immediate solution. It is caused by a design flaw (long since rectified) and those people who experience this problem should see an authorised Apple dealer for a free fix.

Communicating with your Apple should be as reliable as with any other equipment. Proper software and hardware should obtain good results for both hobby and professional use. ⬤
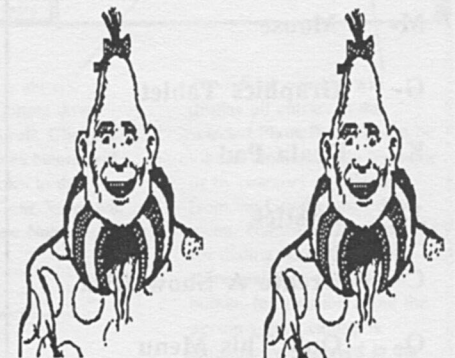
Fantavision -
animated graphics

by Andrew Michael

FANTAVISION IS THE SECOND in a series of mouse operated programs produced by Broderbund. The first of these was *Dazzle Draw*.

When I saw *Dazzle Draw* I thought that Broderbund had reached the top in mouse operated programs, but they have made *Fantavision* even better.

The program works on the principle that you make one picture at a time, and then after you have made all the pictures that you want, you flip them over one by one.

A good example to illustrate this would be to start off with a man in a standing position, and then in the next series of pictures keep the body in the same position but move his legs. When the "Movie" was finally run it would look as though the man was walking.

This idea is obviously a simple one. On the Show Disk there are more complicated ones, eg a fish swimming and breathing.

The Main Menu looks like this:

```
= [ FANTAVISION MENU ] =


M-    Mouse

G-    Graphics Tablet

K-    Koala Pad

J-    Joystick

C-    Create A Show Disk

Q-    Quit This Menu
```
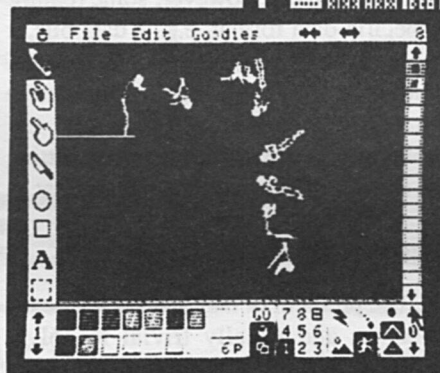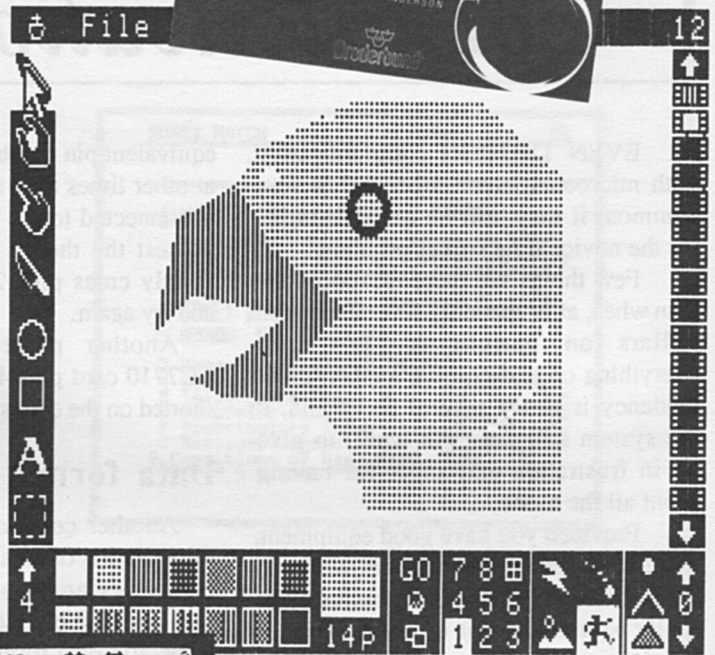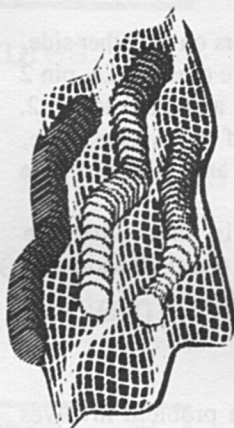
The advantage with this menu is that it supports more than the mouse. The problem that you might encounter with using the joystick is that you can never get it to stay in one place, so that makes it difficult to use the menus.

The menus on the top of the screen are FILE, EDIT, GOODIES.

The options for FILE range from Loading and Saving Movies or Backdrops to Formating a Disk.

The options for EDIT are the things that makes the program so easy to use -

they are Undo, Cut, Copy, Paste, Clone and Zap. Although these options are not used very often, they come in very handy sometimes.

The options for GOODIES are Zoom, Turn, Lean, Flip and Squash. These options add variety to the movie.

My overall impressions of *Fantavision* are very favourable because it is like a little Movie Maker. *Fantavision* excels any other mouse operated program but there is one drawback, and that is that you cannot Print out a picture. That is easily overcome by making a screen dump, which is what I've done to illustrate the main idea behind *Fantavision*. (See Picture 1).

In my opinion the program is worth buying and is also the best program released in 1985.

(For the 64k Apple II+, IIe, IIc. Price $79.95. Distributed by Imagineering, (02) 662 4499.)

Sidekick
Mac Helper and Timesaver

FIRST AN ADMISSION of bias. I truly believe that the software company Borland International has done more for computing than any other software company. They have transformed the way in which software is marketed and, in doing so, they have forced the price of many programs down to a level where they approach sanity.

The result of their intelligent pricing policy and their radical approach to marketing is they sell programs, some of which one would have thought would have had a limited appeal, in quite amazing and unprecedented quantities.

Who would for a moment imagine that a program on Pascal would sell over 400,000? Yet it did. Because it was priced at under $50. At that price level you can buy a program just to see whether you like it or not. And all the Borland programs are very likeable.

Most of the programs they produce are designed to fit into the upper part of the memory of IBM PCs and their myriad clones, where they can be called upon when wanted, and where they can make up for some of the awful and obvious faults of the IBM PC operating system. Their virtue is they fix problems, fill in gaps, present services, and these fixes make the IBM PC into a friendly machine - at least something less than totally hostile.

When it comes to the Macintosh, Borland is in something of a quandary because such gaps, such problems simply do not exist. Almost everything Borland produces for the IBM already exists on the Macintosh. To add the

normal range of programs would be gilding the lily.

There is one exception to this rule - and that is *Sidekick*. This is the best selling program in the Borland stable and gives the IBM some of the power of the

Macintosh in its ability to use a note pad, check the date and move in and out of programs with ease.

A direct transfer of the IBM *Sidekick* to the Macintosh would be pointless. Instead they have looked for added benefits which would help the Apple user.

The admirable Frenchman who is in charge of Apple Product Development, Jean-Louis Gassee, wrote about the program, "Take my compliments as a user. When I see *Sidekick*, I know I want it." (Pardon, for the moment, the grammar, I am sure it reads better in the original French.)

SideKick Main Display

This is SideKick's application main display. Note the following parts:

Long Distance box is used to select or deselect the use of the long distance service checked-off in the **Services** pull-down menu.

Incoming box is used to designate a call as incoming. If checked, the call will be logged as [in] and phone charges will not be calculated.

Active name window—tells you who you're calling.

Active number window—tells you the number that is being dialed.

Time-stamp and billing displayed here.

PhoneBook filename listed here. PhoneBooks can be changed from the **Goodies** pull-down menu.

Dialing status window—tells you when to pick-up the phone, etc.

Manual dialing pad—clicking these buttons will generate dial tones.

Start and **Stop** button are used to accurately time the call. Clicking the Stop button will record the call to the PhoneLog.

Clear is used to clear the active name and number windows.

Calendar is used to bring up the monthly Calendarbook or Week-at-a-Peek.

New Entry is used to enter new names into the current PhoneBook.

Phone Notes is always available for jotting down notes about a call. Clicking the **Write Notes** button will append the notes to the PhoneLog. **Clear Notes** will clear the Phone Notes window.

PhoneBook window will display all entries in the selected PhoneBook. It can be viewed alphabetically by *name* or by *category* as selected from the **Goodies** pull-down menu. Names may be selected for dialing here: Click the name and then the **Dial** button. Information about the person you're calling is temporarily displayed in the PhoneBook window.

What does the Macintosh *Sidekick* do?

* Gives you a **full screen editor** and a **mini word processor** that can be used within programs like *MacWrite* and *MacPaint*.
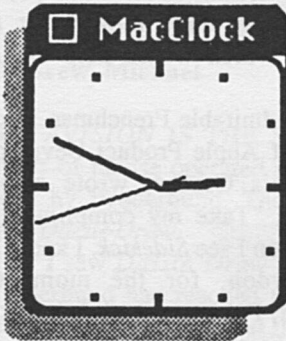
* Has a **full featured financial and scientific calculator** which will print out a paper tape of the calculations.

* Has a **print spooler** which lets you print out text files while you use the Macintosh for something else. This spooler does not, repeat not, work with a LaserWriter. It works with the ImageWriter and, probably, any other standard printer attached to the Mac. But not the LaserWriter. We know. We tried. In many different ways.

* Has a **built in calendar** which can be either daily, weekly, or monthly. It also can be used with a list of things to do which is immensely effective because there is a **built in alarm system**.

This section of the program could undoubtedly be improved by incorporating a sleep mode subroutine such as we had on the Lisa of sacred memory and which is now available as a public domain add-on program. Sadly, the version in the public domain only allows you to use sleep mode once and then you have to reset the computer.

What we need is a program which allows us to leave the Macintosh on all day and dims the screen whenever the computer is not used for five minutes or so. That way we can have all our alarms going off at the right time without the computer possibly, just possibly, damaging its screen.

* Includes an **expense account file** to keep track of travel and business expenses as well as tracking all credit card entries, balances and, in our case desperately important, limits.

* Has a **report generator** that prints out mailing lists, appointment calendar and telephone directory.

* Gives you the time with an **analogue clock face** - the old fashioned kind, as opposed to the new fangled digital - anywhere on the screen of your Macintosh.

* Has compatible software for 300, 1,200 and 2,400 baud modems.

All of which is good, excellent, helpful, copacetic and likewise extremely nice. The documentation, like all Borland documentation, is quite outstanding.

Now we come to the mystery. The original version of *Sidekick* I tested had a telephone dialling feature which would, in theory, work with a modem. I never got ours up and running, possibly because the dialling system on our network is different from that which is standard in the United States. This new version of *Sidekick* has included with it a

strange device called a Phonelink. This little box plugs into the audio connection at the back of the Macintosh

With it you can use the Macintosh to direct dial telephone numbers, even if you do not possess a modem. Which is interesting and useful.

And, at least in theory, you can use the terminal program to automatically dial up databases. To date I haven't used this for reasons which will become apparent in a moment.

In the publicity blurb for the Phonelink it says, "If you have a modem Phonelink works even while your modem is busy with some other task, like receiving or sending a file."

This is the most amazing statement we have seen in the field of communications for a very long time.

If it is true, as I understand it, it means you will be able to transmit data through your modem while carrying on a telephone conversation on the same line at the same time.

To show I have got the publicity's suggestion to rights another quote would be in order. "Now you can automatically dial your telephone numbers with *Sidekick's* MacDialer and Phonelink while your modem is busy uploading or downloading files with *Sidekick's* MacTerm. For example, you can check stock prices on Dow Jones and simultaneously call your stockbroker."

The reason I sound a little dubious in believing this amazing suggestion is that, as far as I can tell, it simply isn't possible. The second reason I have cause to doubt the claim is that the facility is not mentioned anywhere in the manual.

It is just possible reading the publicity material to impute that it
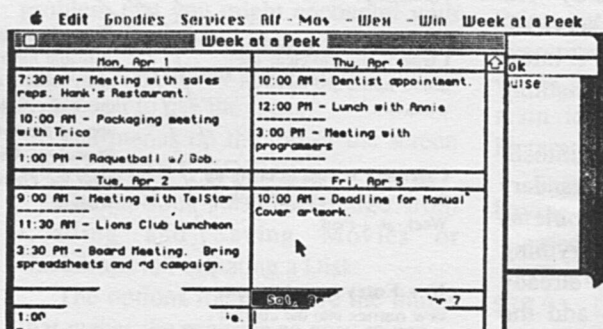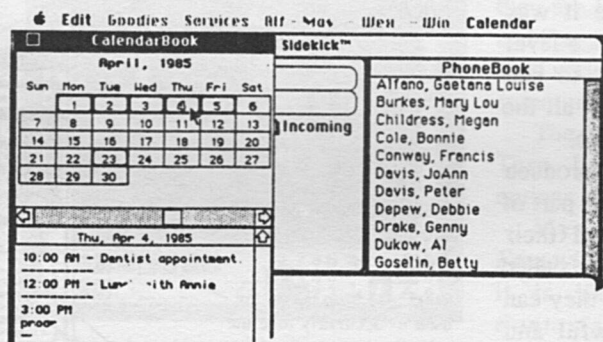
doesn't state you have continuous communication simultaneously but rather that dialling can go on while you are still connected through either the modem or the Phonelink.

If the publicity is misleading then Borland should change it straight away. If it is correct then they should explain how to carry out this wonderful function clearly and unambiguously.

What I did was parcel up the whole box and dice and send it to my mates in NettComm. They know more about communications than is reasonable for a young lad and will no doubt come back with the good oil before the next issue. I will then tell you whether this is the greatest breakthrough in telecommunications or whether it is a naughty publicity person's indulgence in untruthful hyperbole.

If you ignore the claims for the PhoneLink this is still a most

ReadiPrinter text file menu

worthwhile Macintosh program and I have now included it on every machine in the office, loading it down on to hard disk. Next month we will let you know the answer about the simultaneous voice/data transmission. ⚫

Choose a name from the PhoneBook pull down menu
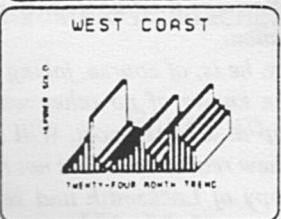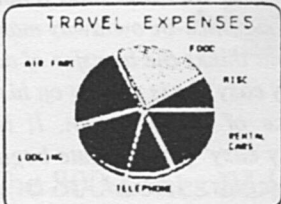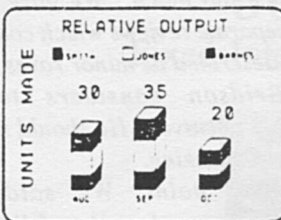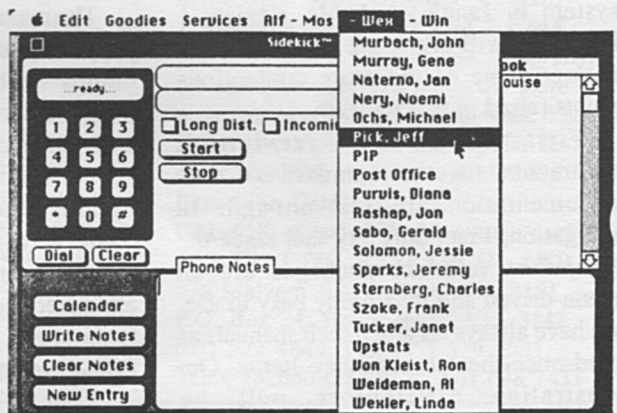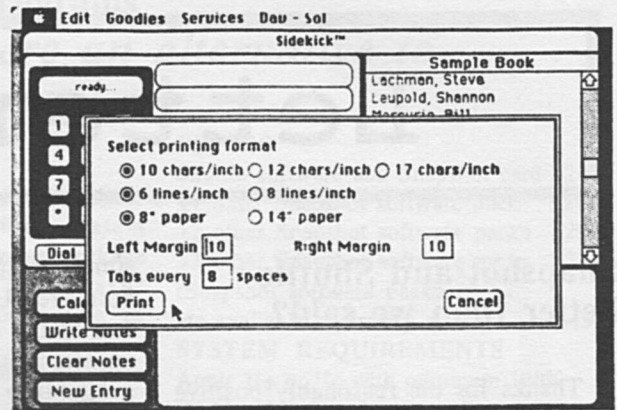
MasterChart!

For Apple II+, IIe and IIc. The illustrations shown here are examples of charts created with MasterChart! Within seconds, keyboard entered data can be converted into picture-perfect pie or bar charts, in 26 user-selectable styles, automatically scaled and labelled, and in colour or black and white. MasterChart! comes with . . .

A **Slide Projector** for automated presentations of a series of charts.

A **Graphics Editor** for alteration and embellishment of charts.

A **Graphics Print Routine** that works with 34 different printers and 50 different types of printer interface cards.

To order send cheque or money order for $78.95 (inc. post. & handling) to: SPECTRAL GRAPHICS SOFTWARE,
PO BOX 134,
BEENLEIGH, QLD 4207.
· PHONE : (07) 287 5010.

If not completely satisfied, MasterChart! comes with a 30 day unconditional money back guarantee.
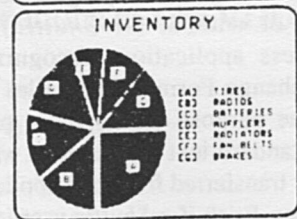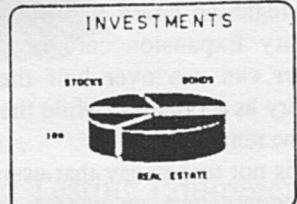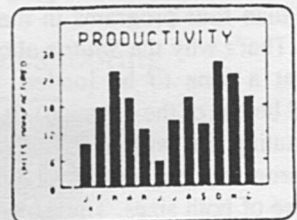
Letters

Snapshot and Shuttle better than we said?

Thanks for the reasonably positive and informative review of our *Snapshot* system in January's *Apple Review*. I hope you will allow me some space to answer some of the more contentious points raised in that review.

First of all, your reviewer's comments on the standard of our documentation are fair enough. In mitigation, I can only say that since the *Snapshot* software packages are all menu-driven and thus pretty easy to use, we have always regarded their manuals as read-once-then-throw-away items. Our Australian distributors will be responsible for our product documentation in future and may well take a different view.

We agree with your reviewer's opinion that users are unlikely to need more than four programs in memory at once. That's why the *Shuttle* allows only four at a time to be loaded. (Eleven would be out of the question). It is worth mentioning that with an Apple //e, those four programs can be 64K or 128K, or a mixture of both sizes. Thus, owners of a one Megabyte board like the Apple ll Memory Expansion card or Cirtech's Flipper can use over half their extra memory as a ramdisk, while the *Shuttle* uses the remainder.

It is not true to say that users cannot transfer data from one program to another (with or without the *Shuttle*). Many business applications recognize Data Interchange Format (DIF) files for this precise purpose. Many more programs use standard text file formats which are easily transferred from one application to another. Even if a *Shuttle* user is using a variety of operating systems, by

simply keeping a utility like Quality Software's Universal File Conversion in one of the *Shuttle* workspaces, data transfer is still rendered fairly easy. (The availability of a ramdisk makes the process even easier.)

The main advantage of the *Printerrupt* over other methods of obtaining screen dumps is its ability to deal with any program, not just those which are not copy-protected or those that leave screen-memory intact after a Control-Reset. (You must yourself have come across plenty of programs that simply reboot if a Control-Reset is attempted; how do you get screen-dumps from them without a utility like the *Printerrupt*?)

Your reviewer seems to discount the *Copykit's* ability to deal with multi-access programs and claims that it will not copy *all* memory-resident programs either. I would take issue with him (or her) on both counts. The truth is that the number of programs (memory-resident or otherwise) that the *Copykit* cannot be used to back up - with a lesser or greater degree of effort - is minimal. We at Dark Star have never come across a memory-resident Apple-compatible program which the *Copykit* couldn't back up when, in many cases, every other method failed miserably. I've never heard of these "dozens of ways of achieving the same effect at a much lower cost" that are alluded to, but I suspect that if they really existed, we would have bitten the dust (along with our competitors) a long time ago. By the way, I am puzzled by your reviewer's inability to make working copies of *Copykit* backups. As far as I know, not one of our thousands of customers around the world has experienced this difficulty.

Finally, having stuck with me this

far, I thought your readers might be interested in our latest addition to the *Snapshot* family, the *UniCopy 3.5*. This package uses the interrupt-and-resume power of the *Snapshot* card to let users boot any memory-resident program from a 5.25" floppy and then save it to a UniDisk 3.5 diskette in just a few seconds. It allows up to twelve programs to be stored on the same diskette regardless of the operating systems they normally run under. Switching programs can be accomplished with the minimum of effort by using *UniCopy 3.5* to interrupt one, save its current status, and then load another. Each program on a *UniCopy* diskette resumes running at the point of interruption, so time-consuming disk I/O operations and searching for where the user left off are both eliminated.

David Bridson
Marketing Manager
Dark Star Systems, England.

Editor: Splendid to think that even in the Old Dart they read this magazine.

This long and defensive letter from David Bridson brings to mind the Shakespearian line, "Methinks the lady doth protest too much." We gave Dark Star two separate reviews which could be precisely described as minor raves. This David Bridson considers to be "reasonably positive"? He should see us when we are attacking.

Point by point. We said the documentation was less than felicitous. Even as read-once-throw-away manuals.

If David thinks the transfer of data is "relatively easy" he is calling on his wide experience of the program. It is not "relatively easy" for absolute beginners like ourselves. Indeed, it is damn difficult. Perhaps it is the quality of the documentation.

Finally, he is, of course, joking when he says he knows of no other ways of backing up at a lesser cost. Will every Apple Review reader who does not have a broken copy of Locksmith and several other breaking programs please raise their right hands? And answer there was none.

New Macintosh Plus. We've added
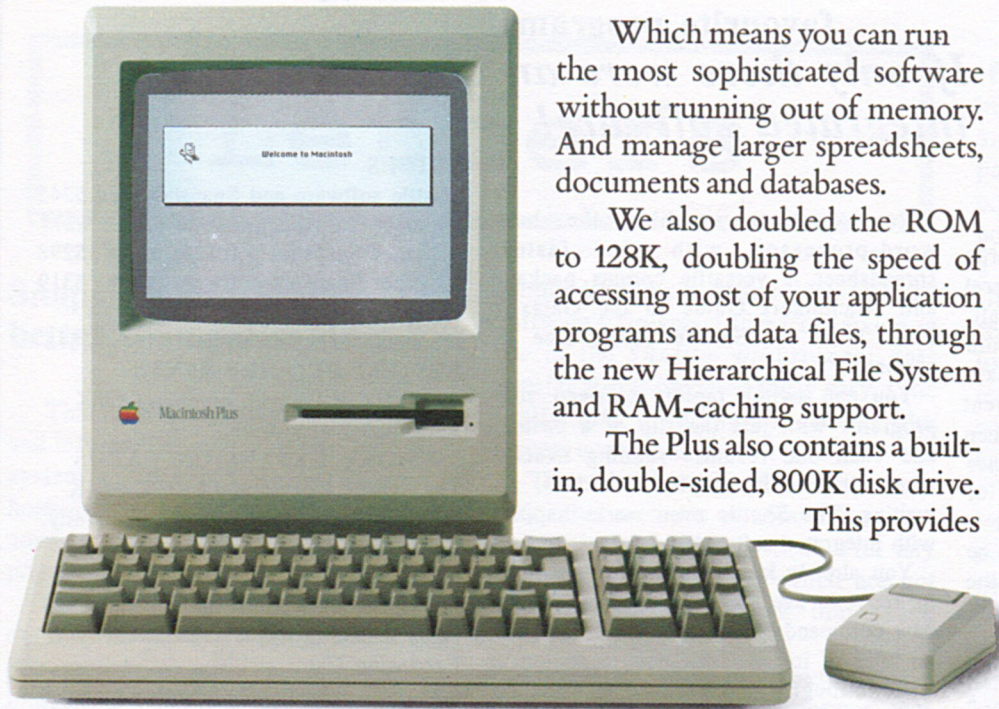
This year Apple introduces a new Macintosh.

Macintosh Plus.

As the name suggests, it's evolutionary, rather than revolutionary

(It's not our policy to bring out totally new computers for the sake of it. Instead we strive to perfect existing ones.)

Macintosh Plus is as simple to learn and use as before.

But there are some big differences, encouraged, we don't mind admitting, by current Macintosh owners.

Some of you asked for more power, others speed. Some needed greater storage capacity, others expandability.

Some heavy number-crunchers wanted a numeric key pad and conventional cursor keys built into the keyboard rather than remote.

Done. Done. And done.

The pluses of this new Macintosh include a full megabyte of RAM (expandable to four megabytes).

Which means you can run the most sophisticated software without running out of memory. And manage larger spreadsheets, documents and databases.

We also doubled the ROM to 128K, doubling the speed of accessing most of your application programs and data files, through the new Hierarchical File System and RAM-caching support.

The Plus also contains a built-in, double-sided, 800K disk drive. This provides twice the capacity of the previous Macintosh and the equivalent of 400 typed pages, or a bulging file drawer.

If that's still not enough, you can always plug in another 800K external drive.
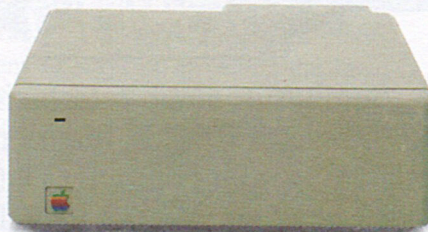
Or you can really go all out and add our new Hard Disk 20.

(Its 20 megabytes are about 10,000 pages worth.)

Just plug in a Macintosh Hard Disk 20 and you can keep all your software, files, worksheets and documents within a moment's notice of your screen.

Add the Apple program Switcher, and you can actually work with several applications at once, moving information from one into another with the greatest of ease.

So you can transfer notes from an outline to a report – or numbers from a data file to a spreadsheet – as fast as you can click your mouse.

AppleCare.

All Apple products come with an automatic 3-month warranty covering all parts and labour.

But this year, Apple introduced a sort of "Warranty Plus" through the AppleCare service programme.

If you fill out and mail to us the registration form enclosed with your equipment, you will receive nine extra months' cover on top of the normal three.

Macintosh Plus also features a new SCSI connection port (dubbed "Scuzzy" in typical fashion by the development team).

SCSI stands for Small Computer Systems Interface and it's an industry standard.

We've virtually opened up the architecture. But what we've really done, of course, is open up a whole new world of possibilities.

The Scuzzy port let's you daisy-chain up to seven high-performance (and often low-priced) peripherals like hard disks, file servers and tape backups from all sorts of third parties.

Given all this power, it made sense to team it with equally impressive printers.

The new LaserWriter Plus is just such, producing documents with text and graphics of publishing quality.

everything except complications.

And it maintains this fidelity on copy paper, letterhead, labels, envelopes or overhead transparencies.

LaserWriter Plus has 35 different typefaces built in, a choice that would embarrass your local printer (and his invoices).

But if you don't need publication-quality printing, you can have near letter-quality by teaming up your Macintosh with the ImageWriter II.
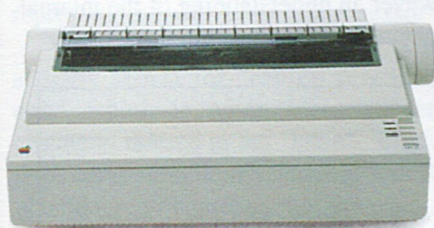
It prints in three different modes: high-quality, standard and draft. And churns it out at speeds of up to 2½ pages per minute.

You can feed in single sheets automatically with the optional SheetFeeder.

And print up to seven colours using appropriate software.

ImageWriter II can also be shared with other Macintosh users via AppleTalk.

But this Macintosh isn't called Plus for nothing. You can just add and add.

Items like an AppleTalk Personal Network.

It's the most flexible, low-cost, easy-to-set-up, easy-to-use network around.

It'll connect up an office full of Macintoshes, LaserWriters, ImageWriters and file and disk servers – 32 devices in all.

Using an electronic mail package, you can send messages to any Macintosh screen on the network.
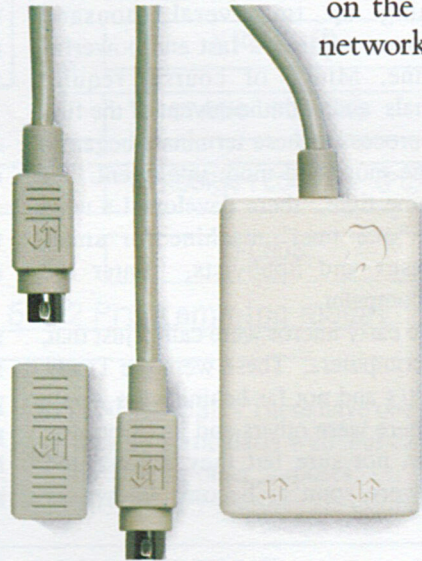
Or with EtherMac software you can share information with other computers. (Our computer is so friendly it'll even talk to IBMs.)

Add an Apple Modem 1200 to your Macintosh and you can talk to anyone virtually anywhere.

With a communications program like MacTerminal, a standard telephone and an Apple modem, your Macintosh can plug into electronic information services like Viatel, Minerva and Midas and communicate with mainframes and minicomputers.

If you already own a Macintosh, there's another plus.

You can upgrade your machine to the new one megabyte. Ask your dealer for upgrade details.

You can also upgrade your LaserWriter to become a LaserWriter Plus.

Get hands-on with the new Macintosh Plus.

You should like it.

You helped design it.

For an authorised Apple dealer near you outside Sydney, you call toll-free (008) 22 1555 or Sydney 908 9088. AP 219/Palace

 Apple

Apple Assembler

by Craig Kirkwood

LAST MONTH WE LOOKED AT the components of a microcomputer, discussed the use of high level languages and learnt how to access the Apple's "mini assembler" from the monitor. That's all well and good, but let's extend our knowledge a little further and take a closer look at the heart of the Apple; presenting the 6502.

The 6502 microprocessor was originally designed by a company called MOS Technology Inc., who were a "breakaway" group from the giant American manufacturer Motorolla. Since then other companies such as Synertek and Rockwell have also produced them. The original bipolar version has been superceded by several CMOS versions of the chip which boast higher clock speeds and increased instruction sets . Suffice to say at this stage that they are all very similar and the differences in instruction sets between different versions of the same chip will not affect the newcomer.

It is this microprocessor which adorns the insides of several popular microcomputers (hereinafter affectionately called "micro") including the Apple][series.

Astute readers may wonder why I use the word "microcomputer" instead of that tired cliche "personal computer". Permit me to explain myself. Firstly, I believe that most personal computers are anything but "personal", with the possible exception of the Mac, and secondly my dislike of the expression is more or less historical. In the bad ol' days before personal computers, we had only "mini computers", those monstrous machines filling rooms and corridors which were (and still are) anything but user friendly. Minis, and their even

bigger brothers, mainframes, are necessary in industry where the sharing of information among what may be anything up to several thousand employees requires a fast and powerful machine. Minis, of course, require terminals and with the advent of the first microprocessor these terminals began to become more and more intelligent. At the same time, there developed a need for a "one man" machine for small businesses and hobbyists. Enter the microcomputer.

The early micros were called just that, microcomputers. These were the Tandy TRS 80's and not far behind - the Apple]['s. There were others and just who was irst I'm not sure but they represented what were soon to become known as

personal computers. The phrase didn't really catch on though until the belated but well timed entry into the market of the big, bold, blue IBM PC. And since then the word microcomputer has all but faded into oblivion.

The 6502 microprocessor is an "8 bit" device, this means it can deal with 8 bits or one "byte" of data at a time. It has 16 address lines and can therefore access a total of 65536 memory locations directly.

Figure 1 shows a pinout of the chip showing the data and address lines as well as the various control signals, clocks and power supply. These signals aren't particularly important at this stage, however an understanding of the internal structure of the chip is more so.
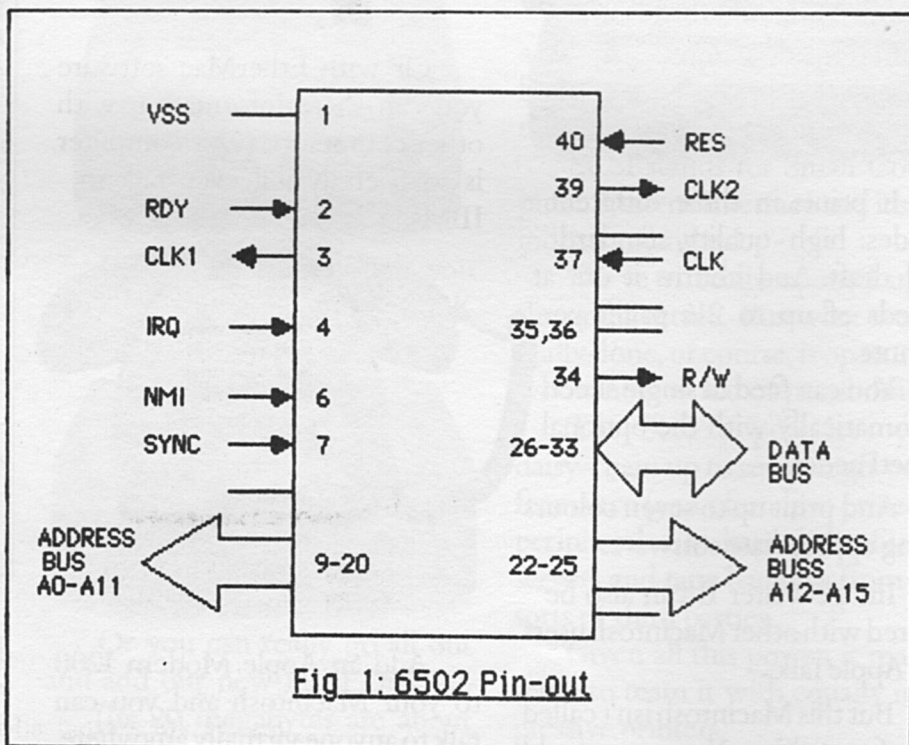
Fig 1: 6502 Pin-out

Figure 2 shows a programming model of the 6502. It shows several blocks, known as registers, starting with the accumulator, then the x-register, the y-register, the stack pointer, and finally the program counter. These are all part of the internal memory of the CPU. They also provide a good example of the internal workings of almost all microprocessors. Variations, of course, are great but all CPU's share in common the use of internal dynamic memory

```
    7                    0
  ┌──────────────────────┐
  │      ACCUMULATOR      │
  ├──────────────────────┤
  │      X REGISTER       │
  ├──────────────────────┤
  │      Y REGISTER       │
8 ├──────────────────────┤
  │     STACK  POINTER    │
15┌──────────────────────┤
  │   PROGRAM COUNTER (PC)│
  ├──────────────────────┤
  │        FLAGS          │
  └──────────────────────┘
```
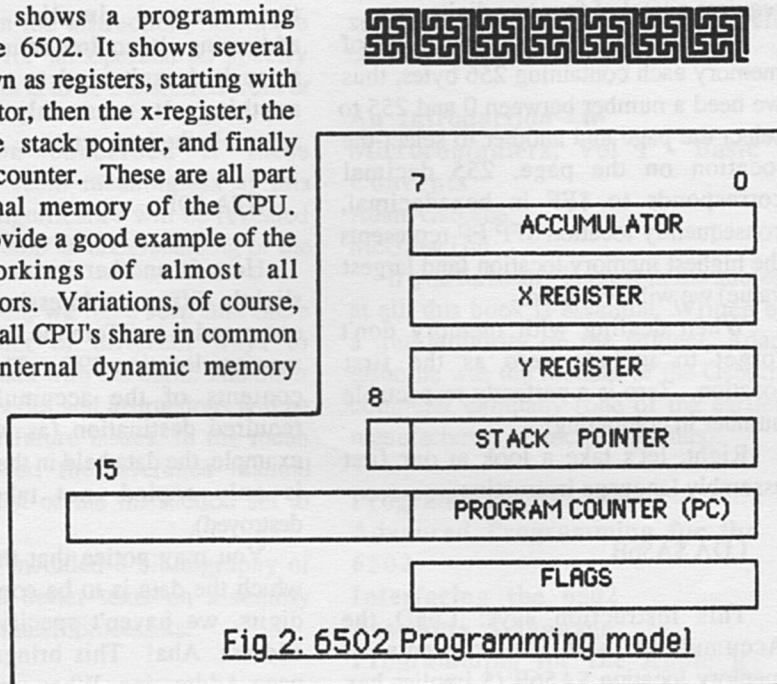
Fig 2: 6502 Programming model

locations within the package itself. You may be wondering how the initials CPU represent the word "microprocessor" .

Well, in fact they don't. CPU actually stands for "central processing unit" which is again historical and originally refered to the "brain" used in mini computers which actually took up several circuit boards rather than one IC package, as is the case with the relatively recent invention of the microprocessor.

The correct mnemonic is in fact MPU (microprocessor unit) but to be consistent with most texts and my own bad habits I will continue to refer to it as the CPU. In this outline I will endeavour to keep the description of the structure broad enough to be general whilst pointing out those features perculiar to the 6502.

The registers of the CPU are vital to the operation of a program. They can be broadly categorised into three types:

GENERAL USE - These can be used for anything you like and are usually involved in most of the CPU's instructions.
The accumulator is a general use register.

INTENDED USE - These have one thing they do particularly well but can also be used for other purposes.
The X and Y registers are examples

DEDICATED USE - These have only one use and cannot normally be used for any other purpose.
The stack pointer, program counter and flag (or status) register are examples.

Some CPU's have many more registers of varying sizes. The Zilog Z80, for example, another very popular CPU among micro's, has several registers which can be used to emulate 16 bit processing. True 16 bit processors such as Intels 80286 and Motorolla's 68000 family have incredibly complex architectures making assembler programming a very difficult task. More recent chips have other areas of memory available as well as serial ports and "memory management" capabilities.

Let's take a closer look at what each component does. The accumulator, as already mentioned, is a general purpose register. It is often used to receive data from the "address space" (memory/input

output), to hold intermediate results of calculations, and to be the source of data to be stored in the address space. Most commands that involve arithmetic, logic, or testing will end up with the result in the accumulator.

The name is yet again historical and relates to the days of early serial bit-at-a-time computers where the accumulator was a funnel through which everything had to go.

The X and Y registers are general purpose registers which do their share of comparisons and logic operations as well as the very usefull task of indexing; I will expand on this a little later.

The stack pointer is a dedicated use register which keeps track of a vital area of memory called the "stack". The stack is an area, external to the CPU (stored on the first "page" of memory) used for fast and easy storage of data. Every time something is put on or taken off the stack the stack pointer is incremented or decremented accordingly. Placing data on the stack only requires one instruction, making it a very useful programming tool.

The program counter is the 6502's only 16 bit register. It needs to be that long since it is used to store a 16 bit address. The program counter always points to the next instruction to be executed. It is incremented upon competition of an instruction.

The flag register contains the condition or "status" of the CPU after an instruction has been executed. The flags have a significant use in programming. They can be used to direct program flow by "testing" them and making a decision depending on their condition. The meaning of each flag is as follows:

N - Negative result. The previous instruction resulted in a negative value when this flag is set (logic 1).

v - Overflow. Indicates that the result of an addition or a subtraction requires more bits than available in the 8 bit register used to contain the result.

B- Software interrupt. This flag is used to differentiate between a software BRK and a hardware interupt.

D- Decimal. When this flag is set the result of an arithmetic instruction should be interpreted as BCD (binary coded decimal)

I- Interrupt. This flag is used to "mask" or hide a maskable interrupt. Interrupts will be explained in future issues.

Z- Zero. When set the result of an instruction (operation or comparison) was zero.

C- Carry. This indicates an arithmetic carry or borrow occurred during an operation. Carry, somewhat confusingly, is also used to "catch" the remaining bit in a shift instruction.

Before we dive into the instruction set of the 6502, we need to have an understanding of the way in which the memory is arranged.

We know the CPU is equipped to address a total of 64K memory locations (1K = 1024 bytes). Because of the addressing features of the 6502, it is convenient to partition the memory into logical "pages".

A page is simply a block of 256 bytes. Thus memory locations 0 to 255 are page 0 of memory. This first page is referred to as zero page and is used a lot in assembler programming. The next page is used for the stack but the remainder of the address space is unconstrained by design.

On the Apple, certain areas of memory are used for other specific tasks such as housing DOS and BASIC variables. The reference manual contains a detailed description of the use of memory and what areas are available for user programs.

To access a particular memory location we must first select the page and then the location within that page (this is actually done in reverse order). This

requires a total of four hex digits.

We have a total of 256 pages of memory each containing 256 bytes, thus we need a number between 0 and 255 to select the page and another to select the location on the page. 255 decimal corresponds to $FF in hexadecimal, consequently location $FF FF represents the highest memory location (and largest value) we will ever need.

When dealing with memory don't forget to include zero as the first location. Zero is a perfectly respectable number in computing!

Right, let's take a look at our first assembly language instruction.

LDA $A56B

This instruction says: LoaD the Accumulator with the contents of memory location $A56B ($ implies hex notation).

When this instruction is executed, a copy of the data held in location $A5 on page $6B is transfered along the "data bus" to the accumulator. In this example we have used Absolute Addressing. There are 12 main addressing modes on the 6502 each of which have certain advantages and disadvantages and have specific uses. I will introduce them all eventually, by example.

The above example takes three bytes of memory. By that I mean the CPU will require three locations to store the instruction in memory when it is assembled (translated to hex machine code); i.e. one byte to store the code for "LDA" and the remainder to store the 2 byte address. Other addressing modes take more or less memory and consequently may be faster or slower to execute. Here is another example using Immediate Addressing.

LDA #$2B

This is the same instruction but using a different addressing mode. The instruction says LoaD the Accumulator immediately with the value $2B. The hash sign before

the operand implies immediate addressing. It requires no memory access since it doesn't need to store or fetch anything. It uses only 2 bytes to assemble the instruction.

STA $9F

Here is another instruction using a slightly different addressing mode. The command is to STore the Accumulator at memory location $9F. This copies the contents of the accumulator to the required destination (as with the first example, the data held in the accumulator is only copied- not taken away or destroyed).

You may notice that the address to which the data is to be copied is only 2 digits, we haven't specified the page address. Aha! This brings us to Zero page Addressing. When we access zero page there is no need to specify the page address since it is automatically assumed to be zero. Consequently we have eliminated the third byte and are left with a faster 2 byte instruction. We have saved ourselves one whole microsecond!

You may indeed laugh but reducing the amount of time invoved in executing instructions is of prime concern in large programs, particularly in commercial applications. Fast and efficient programming is always important no matter what language is used.

TAX
TAY
TXA
TYA

These are all single byte instructions and use Inherent Addressing.

TAX instructs the CPU to transfer a copy of the contents of the accumulator to the X register. **TAY** is the same except transfer to the Y register, **TXA** transfers from the X register to the accumulator and **TAY** - you guessed it - transfer from the Y register to the accumulator.

Inherent addressing means the address

is inherent in the instruction; i.e. there is no need for an operand to specify where the data is to be transferred from or to.

Don't be concerned if these instructions seem meaningless at this stage, their significance will be revealed once we develop an understanding of the device.

So far then, we have seen that there are a number of different ways to manipulate data with the 6502. The other addressing modes and instructions will be discussed in future issues. In the mean time, however, the reference manual provides a list of the instruction set to ponder over.

I've also included a bibliography of some of the better texts on assembly language and microprocessors:

Micro Cookbook, Vol 2 - Machine Language Programming.
Don Lancaster
Howard Sams & Co.
Very good. Don Lancaster has written several texts on digital electronics. His conversational style is very readable.

An Introduction to Microcomputers, Vol 1 - Basic Concepts
Adam Osborne
McGraw Hill

If you have any interest in the subject at all, this book is essential. Written by a true authority on the subject, Adam Osborne was the founder of the Osborne computer company (one of the earliest manufacturers of microcomputers).

Programming the 6502
Advanced Programming for the 6502
Interfacing the 6502
Assembly Language Programming for the Apple][
Rodney Zaks
Sybex Inc.

These four books provide a total course in programming in 6502 assembler. The author has written quite a few texts on various microprocessors.

Between the first three he covers everything from basic concepts to complex data structures, interrupts and I/O programming techniques. The fourth book isn't as good but covers many of the above topics in relation to the Apple.

The Art of Electronics
Paul Horowitz & Winfield Hill
Cambridge University Press

This book was originally written for a one semester course in electronics at Cambridge University. Although much of it is not relevant here, I have found it very informative on some of the principles of digital electronics and microprocessors. The authors take a detailed look at the Intel 8085 and discuss many micro support chips.

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─────────────────────		
SPECIAL!Disks D/S/D/D 3.5" StoMaster		$70
SPECIAL!Disks S/S D/D 3.5" StoMaster		$50
─────────────────────		
Disks S/S D/D 3.5" Elephant (10)	I	$57
Disks S/S D/D 3.5" Fuji (10)	I	$52
Disks S/S D/D 3.5" Maxell (10)	I	$52
Disks S/S D/D 3.5" Memorex (10)	I	$59
Disks S/S D/D 3.5" Nashua (10)	I	$59
Disks S/S D/D 3.5" Sony (10)	I	$55
Disks S/S D/D 3.5" Verbatim (10)	I	$57
DNA Inspector.....T		Call
Document Compare (New!) Model	Ic	$594
Dollars & Sense Forecast Module	I	$86
Dollars & Sense...Trx	Ima	$164
Dow Jones Straight Talk..	I	$99
Dr J & Larry Bird..	I	$66
Drawforms	I	$76
Dust Cover Kensington	I	$19
Early Reader.......		$55
Easy 3D (New!) Enabling TechIc		$173
Electric Checkbook.State of the	I	$95
Electronic PAD.....Ru		Call
Enchanted Scepters (New!)	Ima	$49
Engipac MacDraft V 1.0 Cri		$306
Ensemble........Hayden Software		$362
Entrepreneur Microsoft		$72
EperLogo......ExperTellige	I	$154
Epstart v2.0......	I	$64
EPYX Rogue........	I	$40
Evelyn Wood Dynamic Reader....	I	$90
Excel Notes (New!) Layered	Ic	$129
Excel..........Microsoft		$587
Exodus..........	I	$41
ExperLisp......ExperTellige Ins		$1485
ExperLogo........	I	$163
ExerOPSS.......	I	$372
FactFinder......FactFinder Soft		$183
Facts of the Mac Posters (2) BechIc		$36
Fahrenheit........	I	$59
Fanny Mac Bech Tech	Ic	$278
FastFinder Tardis S'ware	I	$77
Feathers & Space...	I	$51
Felony.........CBS Software	I	$54
File ....Microsoft Corp		$285
─────────────────────		
SPECIAL Filevision Ins		$120
─────────────────────		
File/Report Combination..	I	$231
FileMaker......Forethought	I	$216
Financial Cookbook..	I	$75
Financial Planning.Apropos	I	$118
Flip & File........	I	$42
Fluent Fonts.....Casady Comp	I	$64
─────────────────────		
SPECIAL! Fokker Triplane.	I	$81
SPECIAL! Fantastic (Laser)Printer	Icd	$471
SPECIAL! Forbidden Quest.Pryority		$45
─────────────────────		
Fontastic (Imagewriter) Altsys	Icd	$105
Forecast	I	$88
Fortran 77 Development Sys.Softech		$414
Fortran 77 Language Compiler	I	$341
Fortran Compiler Microsoft		$408
Frogger.........Sierra On-Line	I	$54
Front Desk.....Layered Inc	I	$170
FunPak..........Videx Inc	Icd	$54
Futuria.........	I	$54
Gallery.Micromax (Core Module)	I	$1153
Game Disk #1.......Tr		Call
Gateway.......Pryority Sof	I	$59
─────────────────────		
SPECIAL! Gato Spectrum	Ima	$57
─────────────────────		
General Accents....	I	$41
General Ledger Back to Basic	I	$196
General Ledger BizMac	I	$760
General Ledger Future Softw	I	$492
General Ledger Palantir	I	$165
General Ledger Peachtree	I	$187
General Ledger Rags to Rich	I	$374
General Ledger Superex	I	$374
General Ledger Symposium	I	$368
Graphic Magician..T		$117
Grid Wars........T	I	Call
Guardian Assimilation	I	$48
Gypsy...........	I	Call
Haba Checkminder..	I	$92
Haba Solutions Haba System	I	$54
Haba Solutions Software Bundle..	I	$328
Haba Window Dialler Haba Systems	I	$64
Habacom......Haba Systems	I	$92
Habadex......Haba Systems	I	$272
Hacker Mac......Act		$35
Hard Disk Utility Bay Systems	I	$99
Hard Disks		
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SPECIAL! Apple Hard Disk 20MB		

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Item		Price
Incl. Tax		
SPECIAL!		
SPECIAL!		
SPECIAL!		
SPECIAL		
Mac Botton...		
Mac Drive 10...		
Mac External...		
Mac OmniDriv...		
Mac OmniDriv...		
SPECIAL Mac-...		
Personal H/...		
Hardware - Ma...		
Macintosh 51...		
Incl. Ta...		
Macintosh Pl...		
Incl. Ta...		
Macintosh Pl...		
Incl. Image...		
Peripheral...		
Macintosh XL...		
Incl. Ta...		
Incl. 512K...		
MacWorks & ...		
Write & Mac...		
Incl. Ta...		
Hardware - Ma...		
400K to 800K...		
Upgrade incl...		
Drive & 64K...		
Incl. Ta...		
Other Upgrad...		
Harrier Strik...		
Hayden:Base...		
Hayden:Spelle...		
Head Cleaning...		
Headline Grap...		
Hearts........		
HebreWriter C...		
─────────────		
Extra Special...		
Helix.(New!...		
with Copy II...		
Offer for 1i...		
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Hippo Compute...		
Hippo Jokes &...		
Hippo Sound S...		
Hippo-C Upgra...		
Hippo-C..Leve...		
Hippo-C..Leve...		
Hippo-Lock...		
Hitchhikers G...		
Holy Grail...		
Home Accounta...		
Home Design w...		
Home Executiv...		
Home Pak......		
How a Bill Be...		
How Many?....		
Human Forms...		
I Know It's b...		
Icon Librarie...		
Icon Switcher...		
Images........		
In Motion...		
In Touch...		
In-House Acc...		
Inca..........		
Interlace (Ne...		
Infidel.......		
Inside MacPa...		
inTouch......		
Inventory...		
Inventory Con...		
Inventory Ma...		
Inventory w/k...		
Inventory....		
Investment P...		
Invisicules...		
Jazz..........		
Jazz, Lotus D...		
Jazz Notes (...		
Jetset or Tou...		
Jetstart......		
Junior Ledger...		
KAT..........		
Keystroke De...		
SPECIAL! Keys...		
Kidnotes (Ne...		
Kidtalk......		
Laserstart...		
LazerBase....		
Learning Mul...		
Legacy.......		
Legal Billin...		
Lisa DeskTop...		
Lock It......		
Lode Runner...		
Logo.........		
Lotus Guide t...		
Lunar Explore...		
M.I.D.I. Comp...		
M.I.D.I. Comp...		
Mac + II.....		
Mac 3D.......		
Mac B Cool...		
Mac Bar Code...		
Mac Carrying...		
Mac Disk Cat...		
Mac One Writ...		
SPECIAL! Mac...		

OSH PRODUCTS AT LOW, LOW PRICES!

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Excl Tax $2373
...Pcpc Ima $2618
QuarkIcd $2124
QuarkIcd $2832
xed Tecmar Ics$1873
rt Drive ReI $728
1 MB Corvus $8835
MB Corvus Ic$18188
adise Soc $1725
Systems
Macwrite & MacPaint
6 Excl. Tax $3146
Excl. Tax $3574
r II Printer
Excl. Tax $4290
ith 10MB Hard Disk
Memory Board and
sk Support + Mac
MacWorks Utility
Excl. Tax $5562
Upgrade Exchange
Drive & 128K Rom
credit for 400K
Excl. Tax $551
Call
sion.. I $64
Hayden S'ware
Hayden S'ware $81
Perfect Data I $8
Call
Artsci I $40
icate Plus I $88
Extra Special!
0) Odessa $322
r 4.51 Free!!
time only
nac I $40
I $46
Call
Hippoptamus I $306
Hippoptamus I $174
Hippoptamus I $504
Hippoptamus I $152
Galaxy.Infocom $54
I $53
Continental I $143
Grabber. I $108
Superex Home I $114
I $57
Law Queue I $95
I $55
Th I $132
Somewhere.. I $77
PBI Software I $31
PBI Software Ima $36
I $59
Ann Arbour I $218
S'ware MastersI $169
nt..United I $214
I $66
Layered I $238
I $45
book) I $32
Software Mas I
Rags to Rich Ic $231
Palantir I $171
Superex I $374
Superex I $565
BizMac I $614
Apropos I $118
ooklets(each) I $13
Lotus I $684
(Book) Ima $15
Layered Ic $129
art.. I $64
Softstyle I $59
La Call
Koala Call
I $341
Mac Bck $466
Icd 98
First Byte I $88
Softstyle I $127
I $209
& Chart MicroI $79
Challenger S I $54
I $51
Icd$354
.As Call
Broderbund Softw $45
Microsoft Corp $202
(book) I $39
I $77
Assimilation I Call
Assimilation I Call
I $156
I $275
MPH Computer I Call
Computer Ident $595
Amer.Tourister I $107
New Canaan I $64
Sierra-on-Line I $279
Knife Vol 1 I $41
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(column 2)

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Mac the Knife Vol 2  Miles Comp Ima $66
Mac the Knife Vol 3  Miles Comp I $67
Mac the Linguist 2.Mga  $91
Mac+II  Meacom  I Call
Mac-C w/Toolkit  Consulair  I Call
Mac-C w/Toolkit & Floating PaintI $484
Mac3D  Challenger  I Call
SPECIAL!MacAdvantage UCSD PascalIns$329
MacArt Department Simon & Schuster $50
MacArt Dept........  I $53
MacASM......Mainstay  $165
MacAtlas U.S.A.  Micro:Maps  I $125
MacAtlas World  Micro:Maps  I $125
MacAttack......Miles Computing  $54
MacBackgammon w/Cribbage..Videx I $59
MacBackup  PCA Software  I $88
MacBase......Eqtron Corp I $253
MacBattery Pak  Batteries IncI $59
MacBlack Jack.....Dap  I $37
MacBooster  Mainstay  I $68
MacBorders......Co  Call
MacBusiness Accounting Suite.Soft $659
MacC/MacC Toolkit/Ver 4.0..  I $606
MacCad  Advanced En I $658
MacCad (Templates) Compuservco
  Architectural Design  I $179
  Drafting Toolkit  I $83
  Electrical & Electronic  I $179
  Flowcharts & Logic  I $145
  Home Designer  I $179
  Layout Planner  I $162
  Mechanical Design  I $179
  PC Board Design  I $179
  Rules Isometric w/Ovals  I $162
  Single Line Isometric Piping I $179
  Single Line Orthographic Piping $179
  Two Line Orthographic Piping I $179
MacCalendar......  Icd$117
MacChallenger.....Aegis Developmen $57
MacCharlie  Dyna Comm.  I $3445
MacCheckers w/Reversi..Videx  Icd $46
MacCoach  Ati  I $85
MacCommand.........  Call
MacCopy  Tesseract S'ware $85
Maccountant  Digital, Etc I $287
MacCover........Soft  $34
MacDaisy Wheel Connection..Ass $160
MacDasher  Kaz Bus.Sys. I Call
MacDesk......Intermatrix  I $119
MacDisk Catalog II  I $85
MacDoctor  Ver. 2.5 Cri  $156
MacDraft........IDD  $330
MacDrafting 1.0 General..Cri  $189
MacDrafting 1.1 Kitchens..Cri  $238
MacDrafting 1.2 & 1.3 Electronics.$338
SPECIAL! MacDraw. Apple Computer $265
MacEdge II......Think Education $73
MacEnhancer  Microsoft  I $394
SPECIAL MacEpsom Connection Ass Ima$125
MacFinance......Sup  Call
MacFlip......McCarron-Di  $43
MacForms......Datafood  I $90
MacFORTH.Level 1..Creative Sol Icd$174
MacFORTH.Level 2..Creative Sol Icd$284
MacFortran......Ab  $59
Macintosh XL Pascal Workshop 3.0  $553
Macintosh XL Serve Apple Computer $336
Macinware  I/O Design I $176
MacLabeler.....Ideaform Inc  $66
MacLibrarian  Crystal CanyonI $148
MacLink with cable Dataviz  I $34
MacLink......DataViz  Soft $248
SPECIAL! MacLion  Ima$365
MacLion Run Time Disks  Ima$205
MacLogo......  I $165
MacMail Telecom  Aegis  I Call
MacMail.......  I $81
MacMake  Tardis S'wareI $77
MacManager  Harvard AssocI $61
MacMatch......Axlon  $41
MacMate  SMB Develop I $75
MacMemory Disk  Assimilation I $46
MacMouse Tracks......  AUG I $48
MacMuscle......Te  Call
MacMusic......Ut  Call
MacNetwork Interface Card Corvus I$163
MacNifty A/B Switch Kette Group Icd $96
MacNifty ABCD Port Switch Kette Icd$283
MacNifty Audio Digitizer  Icd$283
MacNifty Joystick Converter KetteI $91
MacNifty Keyboard  Icd$283
MacNifty Sound Digitizer Kette $270
MacNifty Stereo Music System Kette $146
MacNosy  Jasik Designs FID $109
MacNumeric Keypad Apple ComputerI $185
MacOffice........  I $51
MacOffix........  I $174
MacPac  AFC Care  Ic $81
MacPaint  Apple Computer  I $149
MacPalette (New!) MSP  Ima$101
MacPascal  Apple Computer I $174
MacPerspective..  I $262
MacPic 1.......  $60
MacPic 2.......  $60
MacPlot  $196
MacPlot Adaptor...  $275
MacPlot II Draft Version..Cop Ins$244
MacPlot Professional  Ins$313
MacPoker......DataPak Software $37
MacPort Adapter  Assimilation Ins$108
MacProgrammer's Library Tardis $329
SPECIAL! MacProject Apple Computer $153
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(column 3)

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MacPublisher........Boston Softw I $136
MacPuzzle........Industrial Compu $37
MacSecurity Kit  Apple Comput.I $77
MacSlots.........  $49
Macspeak  Superex  I $46
MacSpell Write...Assimilation Ins$111
MacSpell+......Creighton De I $112
MacStation  Microrain  I $208
MacSwivel  Kensington Soft $81
MacTablet  Summagraphics I$1040
Macintosh Accessories
Numeric Keypad  I $90
Security Kit
  Incl Tax $176  Excl Tax $156
Carrying Case
  Incl Tax $77  Excl Tax $68
Carrying Case
  Incl Tax $139  Excl Tax $123
SPECIAL! Macintosh 68000 Devel.Sys.$234
Macintosh Pascal  Apple Computer $153
Macintosh Programmer's Library.. $328
Macintosh Sampler..SS  $10
Macintosh XL 7/7 Software(Incl Terminal
Draw,Graph,List,Project,Write,Calc &
Office System) Apple Computer  $761
MacTerminal  Apple Computer  I $132
MacTilt  Ergotron  I $182
MacTote  Optimum  I $156
MacTracks  Assimilation  I $46
MacTracks......Assimilation Pro $46
SPECIAL! MacTransfer SthEastern Ima $59
MacTurbo Touch  Assimilation Ic $246
MacType  Palantir  Ima $64
MacVegas  Videx...  Icd $84
MacVision  Koala  Ima$469
MacWork Multiplan (book)  I $32
MacWorks & Hard Disk Support
  Incl MacWrite/MacPaint; MacWorks
  for Macintosh XL Apple Computer $266
MacWrite  Apple Computer I $149
MacZap  Microanalyst I $75
Mad Mac & His Mindbox..  $64
Magic Digitizer  New Image TechI $648
Magic File.........  I $126
Magic Slate........De  Call
Magic Video Digitizer New Image Icr$725
Mahogony Desk Case Smith & Bel I $45
SPECIAL! Mail Centre 2 user  Icd$353
SPECIAL! Mail Centre 6 user  Icd$569
SPECIAL! Make Millions Scarboro I $62
MailManager........SofTech Mic I $152
Main Street Filer..Main Street I $108
Management Edge  $289
Market Link........  I $99
Market Manager PLUS..Dow Jones I $237
MasterForth Base System..MicroM I $196
Masterpieces.......  I $214
MasterType.....Scarborough Syst $61
Math Flash  Palantir  I $57
Mathblaster  Davidson AssocI $57
Mathpak.........Ph  Call
McPic Vol 1 or 2  Magnum S'wareI $57
McTrivia........McCarron-Dia I $50
MegaDesk........Megahaus Cor I $148
MegaFiler (Update)..Megahaus CorpSos $33
MegaFiler......Megahaus Cor Sos$272
MegaForm......Megahaus Cor Sos$272
Megamax C Compiler Megamax I $383
MegaMerge (Update) Megahaus CorpSos $33
MegaMerge........Megahaus Cor Sos$177
Micro Imager  Serdyne Sys  I $884
Micron Eye  Micron Tech  Sos$541
SPECIAL! MicroPlannerMicro Plan Ins$605
Microsoft Multiplan (book)  I $32
MicroTest II......  I $328
MIDI Composer........  I $48
Mighty Mac....Advanced Log I $77
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(column 4)

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Mind Over Mac  Think Educationa $43
Mind Prober.....Human Edge S I $57
Mindsight (New!) Execucom  Ic $92
Minicad 3D-Designer Ver 1.0 Cri $687
Minicad complete 3D/2D system Cri $687
Mite  Mycroft Labs I $189
Mite/Mac..  Mycroft Labs I $192
Modems
Apple Modem 1200(includes VideoText)
  Incl Tax $637  Excl Tax $576
AppleLine (Limited availability)
  Incl Tax $2156  Excl Tax $1891
Modem Accessory Kit for Macintosh
  Incl Tax $59  Excl Tax $52
ProModem  Promethus Icr $949
Smartmodem 1200 Hayes  Icr $1005
Smartmodem 2400 Hayes ICR Icr$1621
Smartmodem to Mac Cable Hayes Icr$51
Monster Mac......Lev  Ins$1873
Mouse Cleaning Kit w/pocket Kensing $39
Mouse Exchange BBS.Dreams of P Icd $81
Mouse Exchange Terminal Dreams  I $58
Mouse Pad  South Bay SysI $30
Mouse Pocket  Kensington  I $33
Mouse Stampede...Mark of the Unic $33
Mouse Stick  Video 7  I $99
Mousetrak Pad  Mousetrak I $20
Multiplan......Microsoft  $285
Murder by the Dozen..CBS S'ware I $47
Music Construction Set..  $94
MusicType 2.0  Shaherzam  I $84
MusicWorks  Hayden S'wareIma $97
My Office.........  I $159
N*cryptor  Mainstay  I $55
Neon...........Kriya System Ins$284
Netway  Tri-Data  I Call
NewGammon......Newsoft  I $44
Not Like The Others..  I $79
Numeric Turbo  Assimilation Ins$361
Nutri-Calc......Camde  I $130
NWA Quality Analyst..  I $702
NWA StatPak......Northwest An I $548
Omni Talk  Corvus  I $767
Omni-Reader  Oberon Inter I $1120
Omnis 2........Organizational  $175
  Warning - Price will be increased to
  $225 on Tue 8th April, 1986.
Omnis 3........Organizational  $529
  Warning - Price will be increased to
  $569 on Tue 8th April, 1986
Omnis 3 w/Corvus H/D (2-5 users) $1086
Omnis 3 w/Corvus H/D (6-10 users) $2173
On-Line Information Network..  I $66
Open for Business I or II Open  I Call
Orbiter...........  I $79
OverVUE  ProVUE  Sos$265
OverVUE Upgrade to Ver 2.00 Ins $30
P/C Privacy......MC  Call
SPECIAL! Pagemaker Aldus  Soc$647
Paper Airplane Construction Set I $53
Paste-Ease Vol 1...  $81
Payroll (Intergrated)..BizMac I $834
Payroll (Standalone)...BizMac I $231
PC to Mac & Back  Dilithium I $167
Pensate........Penguin Soft I $51
Perplex...........  Ima $84
Personal Accountant  Softsync I $109
Personal Finance Multiplan Temp I $64
PersonalAid......Sc  Call
SPECIAL! PFS File & Rep. Bundle Ima$199
PFS File......Software Publis $185
PFS Report......Software Publis $185
SPECIAL! Pinball Construction Set I $62
Planetfall.....Infocom..  $39
Please Database..  I $284
Plot It  Mesa GraphicsI $145
Polarizing Filter Kensington  I $79
PortaAPL.........  $438
Power Cache  Icd $78
Power Math........  I $130
PreNatal Baby Care  Queue  I $55
Presentation Graphics on Apple Mac $32
PreWriter........  I $210
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(column 5)

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Printer Cover (10" or 15") Ken I $18
Printer Interface...Dap  Ima $86
Printer Stand  Kensingnton Ic $35
Printers (Macintosh)
Imagewriter II
  Incl Tax $1031  Excl Tax $908
Imagewriter II Sheetfeeder
  Incl Tax $356  Excl Tax $313
15" Imagwriter Printer
  Incl Tax $986  Excl Tax $868
9" Imagewriter Printer
  Incl Tax $896  Excl Tax $710
ProCom-M.........  I $152
Procopy  Protekt It I $54
Prof.Bibliographic System (New!)Ic $549
Prof.Composer Mark of the UnicornI $440
Prof.Music Composer.Mun  Ima$513
Profit Profections/Breakeven An I $108
Profit Stalker......Bu  Call
ProPrint Software Only Creighton $80
ProPrint w A/B switch Creighton I $351
ProPrint w cable  Creighton I $134
Proprint......Creighton De I $108
Psion Chess (New!) PBI  Ic $87
Pyramids of Peril..Aegis Developmen $56
QED Typing Made Easy...  $86
Quality Analyst....  Sos$576
SPECIAL Quartet  Haba Sustems Ins$182
Quick & Dirty Utilities..  I $62
Quick Disk  Symmetry CorpI $45
Quick Paint......  I $64
Quick Stik  Kraft  I $112
Quick Word........  I $79
R:base 2000......Microrim Inc I $401
Racter (New!)  Mindscape  Ima $62
Ram Disk 500K Dasch Extern Western$1039
Ram Disk1000K Dasch Extern Western$1547
Ram Disk2000K Dasch Extern Western$2520
RE-Pro 1........T  Call
Reading & Thinking I or II.. I $86
Reading Adventure I Queue  I $66
Reading Adventure II Queue  I $84
Ready Set Go Ver 2.1(New!)  Ima$212
Rendezvous w/Rama..  I $59
Rubicon Publishing Song Painter I $75
SPECIAL! Run for the Money Scar I $49
Sales Edge  $284
Sargon III......Hayden Software $59
SAT Score Improvement Sys (New!)Ic $113
Scanstar-Mac  Computer Ident $1255
Scientific Analysis..  Call
Score Improvement Sys.SAT HaydenI $123
Screengem........Ze  $45
Seastalker........  I $79
SPECIAL! Sidekick Borland  Ima $93
SPECIAL! Silicon Press (New!)  I $99
Slide Show Magician..Magnum Software $79
Smart Alarms  Jam S'ware I $38
Smartcom II......Hayes Microc I $185
Smartthinker  Consulair  I $81
Smooth Talker  First Byte I $107
Soft Palette.each..Decision Sci I $48
SoftForms......Artsci  I $53
Softmaker II......Rio Grande S I $265
Softworks C Compiler..  I $522
SongPainter  Rubicon Pub I $68
SPECIAL Sorcerer  Infocom  I $45
Source On-Line Info Source Tele I $66
Spanish Grammar I,II or III.. I $79
Speed Reader II  Davidson AssocI $79
Speed Reading Tutor Simon &SchusterCall
Spell It  Davidson AssocI $84
Speller Bee  First Byte I $105
Speller...........Hayden  $64
Spellswell (New!) Johnson GreenIc $85
Spreadsheet Link...  I $123
Squire........Blue Chip So I $66
Star League Baseball..Gamestar I $51
SPECIAL! Starcross Infocom  I $43
Starter Pack  Kensington I $132
Starting a New Business Queue I $94
StatFast......StatSoft  I $165
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(column 6)

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Statpak  Sos$576
Statpak Demo (Disk)..  Sos $25
Statpak Manual.....  Sos $80
StatView......Abacus Concepts  $240
StatWorks......Heyden & Son Ima$235
Stock Portfolio System..  I $242
Story Boarder  Ins$1397
Studio Session  Icd$154
Straight Talk...  I $99
Strategic Conquest.  I $66
Superfonts......So  Call
Surge Suppressor Kensington  I $82
Suspect..........  I $59
Suspended..........  I $59
Switcher Contruction Set Apple Com $31
Swivel  Kensington  I $52
Talkshow......Rune Software  I $210
Teach Yourself Jazz Ati  I $85
Teach Yourself Multiplan Ati  I $63
Tech  Linguists Software  I $149
Tekalike......Mesa Graphic I $394
TeleChess......Brainpower  I $90
Telescape  Mainstay  I $53
Tellstar Astronomy Program Spectrum $69
Telofacts 2......Dilithium So I $236
SPECIAL! Tempo (New!) Affinity Ima$121
The Apple Macintosh Book  I $32
The Communications Edge..  $244
The Connectables Network  Call
The Creator......TNT Software I $48
The Crimson Crown (New!) Pen  Ima $57
The Desk Organizer  I
The Easel  Innovative TecIc $39
The Home Accountant Arrays/Con.I $107
The Housekeeper..  I $99
The Investor......  Call
The Management Edge..  $289
The Max  Memory Elec I Call
SPECIAL! The Mind Prober..  I $60
The Missing Link...Ma  Call
The Mouse Mover  Magnum  I Call
The Negotiation Edge..  $326
The Personal Accountant....So I $108
The Printed Word (book)  I $32
The Quest......Pen  Call
The Right Word...  Ins$152
The Sales Edge......  I $41
The Witness....Infocom  I $41
Think Fast......BrainPower  I $43
Thinkfast  Brainpower  I $47
ThinkTank 128K  Living Vid Ins$114
ThinkTank 512K  Living Vid Ins$114
Through the Looking Glass Apple Com $51
Thunderscan Ver 3.1 (New!)  Ima$467
Tilt/Swivel  Kensington  I $55
TimeBase......Soft Design  I $157
TK Solver......Soa  $256
Tlstart  Softstyle I $99
TMON Debugger....  I $196
Tool Pak I or II..  I $79
Toolkit  General Comp I $448
Tools#1  Tardis S'wareI $77
Tools#2  Tardis S'wareI $77
Tosh  Doss Indus  I $402
Toshstart  Softstyle I $143
TPS PC-380 Bar Code Reader TPS Ele Call
Transylvania....Penguin Software $49
Trivia Arcade......  I $44
Trivia Fever Vol 2 Professional So $31
Trivia Fever......  I $44
Trivia Savant....Kastel Techn I $51
Trivia..Mirage Conce I $38
Turbo Turtle  Hayden  I $76
TurboCharger  Nevins Micro I $118
Tycoon......Blue Chip So I $66
Type Now  Mainstay  I $55
Typing Avalanche  Axlon  I $77
Typing Intrigue  Forethought Icd $62
Typing Made Easy  QED Information I $74
Typing Tutor III  Simon & Schuster $48
U.S.Geography Adventure Queue  I $94
UCSD Pascal Devlopment System  I $280
UCSD Pascal Language Compiler  I $199
Ultima II......Sierra On-Line..  I
Ultima III......Origin SystemI  Call
Ultrafonts......M  Call
Universal Printer Stand Kemsing I $77
Utopia............  I $77
VersaTerm  Peripherals  I Call
Video Works......Hayden Software I $148
Videotext Macintosh Apple Computer $86
View Control Data Personic CorpI $395
Vocabulary Adventure I Queue  I $95
Vocabulary Adventure II Queue  I $95
Webster's Revenge..Sh  Call
What Comes Next?..  I $77
WindoWare Calendar.Macadam Publ I $68
WindoWare Phone Book..Macadam P I $68
Wishbringer (New!)  Queue  I $51
Witness......Infocom  I $51
SPECIAL! Wizardry.Sir-Tech S'ware $75
Word Attack  Davidson AssocI $57
Word Challenge II..Hayden SoftwI $53
Word Play  Palantir  I $77
Word......Microsoft Corp $240
Work N Print  Assimila  Ima I $95
World Geography Adventure I $95
World Geography Adventure II QueueI $95
XL/Serve  Infosphere  I $377
SPECIAL! Xyphus..Penguin Software $43
Zap! Invoice......  I $134
Zork I  Infocom  Ima $48
Zork II  Infocom  $54
Zork III  Infocom  $54
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status graph

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Getting it together

NOTHING WE HAVE published has ever aroused so much correspondence and so many telephone calls as our articles on desk top publishing. There is no doubt in our minds, and obviously in the minds of our readers, that this is the way personal computers are going to develop very strongly in the near future. And, as things stand, there is no machine currently available on the market which can approach the Macintosh with its Laserwriter for desk top publishing.

In fact, there are other systems. Systems that are used by the major newspapers and magazines. But these systems start at around $80,000 and then rocket skywards. For example, on the *Sydney Morning Herald*, there is possibly the most expensive installation in the world. Even though this is a system of immense power and flexibility it isn't, quite, desktop publishing. Because it does not have built in, as yet, the ability to make up the pages. Not just broadside pages for the paper itself, but even A4 pages for magazines. There is no doubt this will come. At the moment all paste up is done by artists.

Sophisticated though the system is, it is not as sophisticated as one using the Macintosh and the LaserWriter. Because with the Macintosh you can not only write copy, edit copy, correct copy and check the spelling. You can then lay it out into page format, add the illustrations and then print out the finished result in what is known as camera ready copy.

As things stand, this form of desk top publishing is still only suitable for magazines of a low to medium grade. It is not suitable for magazines with pretensions to high level quality. There is a reason for this. The LaserWriter, as it stands, will only produce printed out copy which works to a resolution of 300 dots by 300 dots per square inch. This is

built into the LaserWriter. However, it is known that a 600 dot engine already exists and Apple are seriously considering including this in a new version of the LaserWriter.

This can only happen when there are at least 8 megabytes of memory built into the LaserWriter itself. And those 8 megabytes of memory have to wait on the arrival of the one megabit chip. Although the chip has already been manufactured in some quantities it is not, as yet, generally or widely available. And not at the price that would make the machine feasible. But, judging by the recent history of such chips, there is no doubt that we will see an 8 megabyte LaserWriter within 12 months from now. And it is very probable that at the same time we will see an option that will allow 600 dots by 600 dots per square inch. At that point the quality is so near to photo typesetting that it makes, effectively, no difference. And at which point we will have true desk top publishing for all magazines that have a page size no larger than A4.

This is an inherent limitation of the Macintosh LaserWriter. It is designed specifically for what Apple consider to be an A4 size. (It is in fact slightly distorted in size). To make a LaserWriter that would produce a page greater than A4 would require a logorithmic leap in memory and we are not likely to see one producing quality results within the next few years. It is possible when preparing magazines to produce two A4 pages horizontally and stick them together to give a much larger format. But, in truth, the results are always something less than felicitous. This is because the mind has great difficulty visualising the finished effect. Which always looks as if it had bent in the middle.

But for sizes up to A4 in desk top

publishing the Macintosh and the LaserWriter are undoubtedly the way to go.

We have been using these machines since day one. Indeed, if the truth be known we've been using them since before day one because we managed to get access to a Macintosh LaserWriter set up in Borneo before they were released to the general public.

Although the program has many bugs in it, we still prefer to use *Ready Set Go* version 1 for making up *The Australian Apple Review*. This, too, will change in the very near future. The reason why we prefer *RSG 1* is that the method of working exactly duplicates our initial method of working using Letraset and paste down galleys. *RSG 2*, which has all the bugs removed and is, indeed, a better program, does not work in that way, and the innate conservatism of the people in the office has meant that we've stayed with *RSG 1*.

This too is about to change. In Hong Kong there is a internationally known graphic designer called Jerry Lee who works almost exclusively with the Macintosh and the LaserWriter. Jerry Lee has taken our sister publication, The Hong Kong Apple Review, and has totally redesigned it. Because he thinks and works as a designer first and as a publisher second he not only does not use RSG. He positively hates it. For him the ideal program in the world is Page Maker by Aldus. He believes it is possible for it to be improved. But not by much.

For him Page Maker works in precisely the same way as he is used to. It allows him to design, lay out, illustrate pages with great ease, great
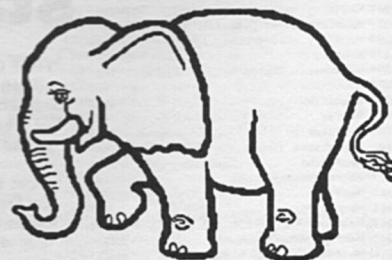
facility and great speed. The other programs that he uses with *Page Maker* are, of course, *MacPaint* but less obviously *Magic Slate*. He considers this one of greatest design tools ever produced for a designer.

In desk top publishing it is not just a question of laying out type, designing headings, dropping in pieces of information. There is also the problem of illustration.

We have tried almost every system available to try and put illustrations into our Macintosh. The system which was introduced into this country called Micron Eye simply does not work with enough resolution to be used in professional publishing. Even people who are very experienced in its use cannot make it perform to a high enough standard. The same is true of Thunderscan. We have used this with little or no success. This Thunderscan system may be useful for amateurs but it is definitely not suitable for professionals. The only way in which you can easily, at this moment transfer images from a book onto a laid out Macintosh page is to use a reducing and enlarging photocopier. This is far from ideal. But it works.

There is a second way which we have not yet mastered but we believe has tremendous potential. That is to use a video camera and *MacVision* to transfer images into the Macintosh

and by the Mac-crazed William Bullock, and we believe that this may be the way to travel. As a result we have acquired a video camera, a video recorder and a MacVision and the next issue of this magazine that you will see will contain images produced in that way.

We have heard that another system is to imported into Australia in the very near future. This will be a flat bed scanner and will, or so we are assured, put the images into the Macintosh at exactly the same resolution as that used by the LaserWriter. It will work well with half tones as well as with line drawings. We will believe it when we see it. Our information is that this machine is going to cost more than somewhat - as in $4,000. However, if it does work there is no doubt it will be snapped up by eager designers world wide. It will be the solution to many problems.

For traditional printers and typesetters there is a new program for the Macintosh which has been written in Australia and which appears to have considerable merit - if you are a traditional type setter. This is *JusText* which provides a full range of typesetting commands. It's got its own text editor built in and it can address the LaserWriter directly. Understand that this is not a product for the average user. Even the author William Bates states that it is for the professional phototypesetter. The program gives professionals the commands and tools they need to produce phototypesetting of the type and quality that they are used to on their professional machines. At least, it will be of the quality when the 600 dot LaserWriter becomes generally available.

This is a new era for the personal computer, a new era that has been created by the Macintosh and the LaserWriter. There is no doubt in our mind that we will soon see a rash of Me-Too programs and machines for the IBM PCs to try and catch up with the massive head start that Macintosh has got in the desk top publishing field. It is extremely unlikely that they can ever catch up totally. They are starting from too far behind.

Apple LaserWriter Fonts (10 point shown)

Courier
The Quick Brown Fox Jumps Over the LaserWriter. — Plain
The Quick Brown Fox Jumps Over the LaserWriter. — Bold
The Quick Brown Fox Jumps Over the LaserWriter. — Italic

Helvetica
The Quick Brown Fox Jumps Over the LaserWriter. — Plain
The Quick Brown Fox Jumps Over the LaserWriter. — Bold
The Quick Brown Fox Jumps Over the LaserWriter. — Italic

Times
The Quick Brown Fox Jumps Over the LaserWriter. — Plain
The Quick Brown Fox Jumps Over the LaserWriter. — Bold
The Quick Brown Fox Jumps Over the LaserWriter. — Italic

Symbol
Τηε Θυιχκ Βροων Φοξ ϑυμπσ Οωερ τηε ΛασερΩριτερ. — Plain
Τηε Θυιχκ Βροων Φοξ ϑυμπσ Οωερ τηε ΛασερΩριτερ. — Bold
Τηε Θυιχκ Βροων Φοξ ϑυμπσ Οωερ τηε ΛασερΩριτερ. — Italic

Apple LaserWriter Plus Extra Fonts (10 point shown)

ITC Avant Garde
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

ITC Bookman
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

ITC Zapf Dingbats
✳❋✺ ✶❖✸✳✳ ✛✢▢◨■ ✦✣▢ ✪◆❖▢□▲ ★✧❀▢ ▼✳✺ ★✿▲❀▢✶▢✳✿✳▼❀▢ ☆❖●
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Helvetica Narrow
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

New Century Schoolbook
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

Palatino
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

ITC Zapf Chancery
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Plain
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Bold
The Quick Brown Fox Jumps Over the LaserWriter Plus. — Italic

MUSIC
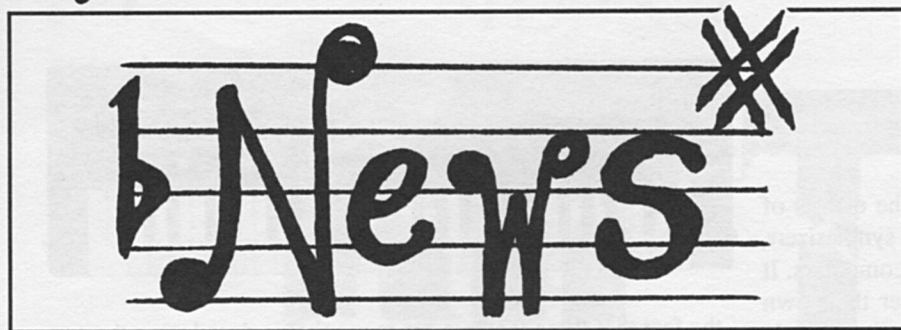
April marks the end of what I considered to be a teething period for this section of the magazine. Teething period indeed! The response from you, our readers, and people in the music industry has literally knocked our socks off. A quick glance at this issue proves just how quickly the interest in computer aided music has grown.

Indeed it seems as if music companies are more interested in Commodore users than most computer companies. And why shouldn't they be, when using your computer for playing and learning music is such a healthy alternative to playing shoot 'em ups. That's it for editorial, so let me present some pertinent news for your edification.

New from Fairlight

A really great idea is a device from the famous or infamous Fairlight people (depending on whether you look at the price or who uses them). The Voicetracker, at $2,500, sounds as though it will have to do a lot to live up to its price, and until someone comes along with some software that will do the same thing with a computer we will just have to shut our eyes and pray. Now that the bad news is out of the way let's look at what it can do.

Basically the machine takes almost any monophonic sound and converts it into an elaborate MIDI signal. It does this with an excellent standard of clarity and precision. The end result is that you can use a guitar, your own voice or a trumpet to control other instruments via MIDI. If you find it hard to get what you want from using a keyboard to control MIDI messages, this is the ultimate solution. In principle such a chore should be child's play for a home computer, so programming whizzes, how about it! I for one would jump at the prospect.

For those with the where-with-all or who are downright rich, the Voicetracker is available from Fairlight Instruments, 15 Boundary St, Rushcutters Bay, NSW 2011.(02) 331-6333.
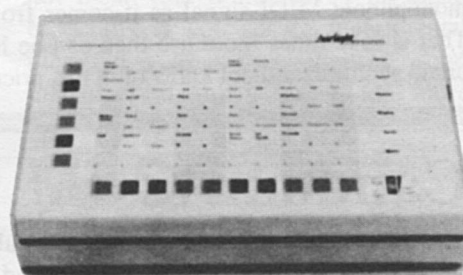
Making Music

Making Music is the title of one of the best written books on music that I have ever read. If you would like an insight to the way professionals in all areas of the music industry work, then this is THE book. Of particular interest are sections written by Sting, Paul Simon, Eric Clapton, Jeff Beck and Herbie Hancock, to name a few. Although published in 1983, the book does have a section on computer aided music and covers the steps in writing and arranging your own songs.

Perhaps the editor's credentials also add to the reasons why I am so positive about the publication. If producing and guiding the Beatles, (the biggest popular band in history) is his background I doubt any would argue with the trueness of his ideals. The man is George Martin, who has a heritage as big and as broad as pop music itself. I really invoke you not to miss out on this mandatory reading.

Making Music is distributed by Pan Books in Sydney.

Apologies

As you no doubt noticed in the last issue Musicomp Marketing have volunteered to be a focus for interest in CAM, but they have called us to apologise to our readers as they have not been able to keep up with the number of enquiries they are having.

None the less we are assured all enquiries will be answered. As the manageress said, "We really didn't expectthe deluge of interest we've had. Our whole business has taken an about face, much to our delight as we are all personally interested in music."

Further enquiries can go to Musicomp Marketing, PO Box 248, Lane Cove, NSW 2066.

MUSIC

Mass market merchants

Music for the Masses is the foundation of the efforts of Mobex, the company behind Casio keyboards and synthesizers, Casio watches, and of late dare I mention, Atari computers. It would appear that their motto takes priority over their own product loyalties, as they have shown much interest in supporting users of other computers. Details of their proposals are in the pipeline, but in the meantime there are two items that I should bring to your attention.

The first is the little known or little publicised advantage of their CZ 101 synthesizer over most other brand synthesizers. The CZ 101 can be accessed by four MIDI channels at once, which means that you can use four of the synthesizer's different sounds at the same time, each playing its own monophonic MIDI signal as it comes from your sequencer. That is four times more use than can be had from any other brand synthesizer that I know of in this price range. Of course the fact that these features are monophonic does lessen the gap between it and other MIDI keyboards which are polyphonic, but the advantages, especially to someone buying their first MIDI synthesizer, are a big plus.

The second tidbit comes with the news of a MIDI digital drum machine that Casio has produced that boasts four sounds that can be sampled or changed by the user. More details will be available soon so keep a watch out for these.

The CZ 101 retails for $799 and the drum machine, the RZ 1, will retail for $1195. Enquiries to Mobex, phone (02)406-6277 or Glyn Johnson at Farrells Music phone (02) 939-2444. Toiv Opilt at Turramurra Music (02)440-8375.

Candour

Pointing out the advantages of other publications is not an act of insanity, rather a show of trust and confidence in our readers that they will remain loyal. And to follow on in that line of thought, it would be advantageous for those of a musical leaning to look at *Sonics* for Australian music news and reviews as an expansion on what you read here. Of late, particularly after the thrust of OS magazines towards computers in general, you can find the occasional CAM article. The latest issue has a review of a JMS software package. They are geared towards muso's so it takes a while to get used to the jargon. The next step is to look at the excellent magazines known as "*E&MM*" and "*1 2 Testing*", both with features on computer music of late. See, we do have the readers' interests at heart!

Surprisingly all these magazines are available from most local newsagents.

Roland helps out

As the amount of support for CAM lovers expands, Roland have made available two booklets that you should know about. The first is quite a well written booklet explaining the basics of MIDI. And I'm sure they would consider sending out this booklet to you if you added your name to their mailing list, which would entitle you to a newsletter type booklet called *Chorus*. It is presently being distributed within the pages of the Australian version of *Rolling Stone* magazine and has a picture of Gary Numan on the cover, apparently a real Roland fan.

Please send your enquiries to Roland Corporation, PO Box W104, Brookvale,N.S.W, 2100. Phone (02)938-3911.
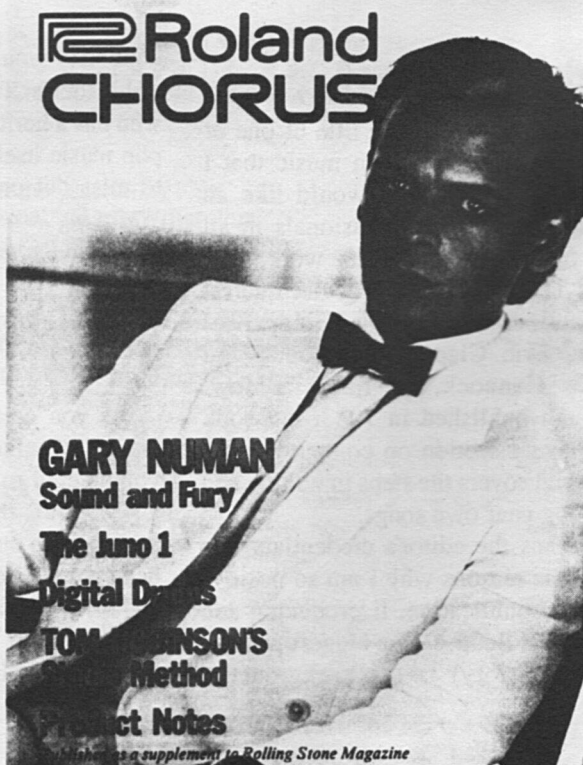
MUSIC

THE RIFT

Computer People and Music

When I first invited the idea of computer aided music I did not realise the advantages that I had over most people. An overview of programs available for computer aided music making does demonstrate a need for computer literate musicians with a knowledge of multitrack recording. As I have found this is a rather select few, it is a wonder that so many people have taken on the struggle and are to this day loyally expending their free time trying to work out how to use the programs to make music.

Don't fret, the sheer volume of interest in the subject will no doubt get writers of such software to clean up their act. But in the meantime I would like to bring to your attention some of the gaps that need to be bridged for you to enjoy the wonderful prospects of writing and playing your own music using computers.

This section will handle the mental blocks that come after you have learnt the basics of working the program you are using and have come to the point of doing something CREATIVE. Anyone can waffle away with some musical doodlings, but how do you go about writing a proper song?

There is a certain magic associated with writing music, decidedly more so with lyric writing. Being magical does not mean that it has to be mystical, especially if you set an instrumental piece in your sights. Writing good instrumental music is a lot more

methodic than you would think. Let me outline what is involved.

Bridging gaps

In an instrumental piece there are four main areas to be written and arranged in an interesting way to maintain interest. These are percussion, bass section, chordal accompaniment and the lead melody line. These could be likened to drums, bass guitar, synth and vocals respectively, in most Rock band lineups.

In our case we don't have a singer or a bass guitarist or whatever. We substitute these with MIDI controlled sound modules and play them all ourselves using our computer. Forget about all that! Computer aided music making tends to bring out the power monger in me.

Anyway, we substitute drums with digital drum machines, use a bass synth for bass sounds, a normal polyphonic synth for chordal accompaniment, and a monophonic synth voice for lead vocals. The Roland MKS7 is ideal for this as is also a combination of a drum machine and a synth such as the CZ101 with multiple MIDI addresses.

Back to the theoretic side of writing. And there are a myriad options open to you. By far the easiest way to start your masterpiece is to select just one of the four groups as a foundation for building the rest of your music. If you have had a melody line humming in your head all day, why not start by putting that down first? It is important if you do this part first to put down what is called a click track in the music industry. It is a timing beat like a metronome to help you keep time and to keep continuity in the piece. A lot of singers tend to write music this way, especially ballads and other melodic forms of music.

Simply set up a track on your sequencer program with a "click" on each beat of the bar. This could be a hi-hat or rimshot on a drum machine. Next you hum to yourself the phrase that you have in mind and try to play it on your keyboard. If necessary slow down the tempo of your click track and get it down with more accuracy. I recommend you experiment with the layering of the other tracks in this order.

1. melody line
2. chordal accompaniment
3. drums and
4. bass.

With each step experiment with different sounds. Drums in particular are hard to write and I will deal with them later.

For more rhythmic music as with Rock, Reggae and Blues, a different approach is needed. The drums have a much more important part to play in the direction of the music. And usually the melody line is the last thing to be layered over the top of the foundation of drums, bass and chords.

An interesting effect is to think up some really good rhythmic bass line using a click track and to write the drums

and chords around it. This is the basis of most good dance music. Think of Grace Jones' song "Dance to the Rhythm".

The whole song is impregnated with a sly drum rhythm that is known as a lazy rhythm in the music world. If you listen to the bass guitar in that song you will hear how closely interweaved a set of drums and a bass guitar can be. The use of neat little counter rhythms and tight emphatic beats make the song really swing. That is part of the legacy that has been given by the black influence in pop music. They seem to have an innate sence of rhythm.

Writing drums

An area of particular contention is the writing of drum rythms. The problem is exacerbated by the fact that most people don't have a good feel for rhythms. A way to solve this is to get a drum machine with an LCD screen that enables you to graphically see what you are playing. The screen may look like this;
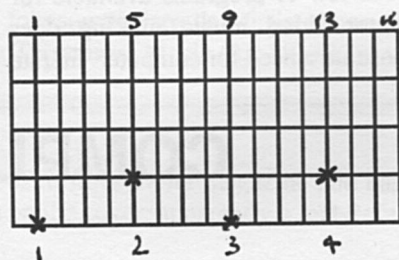
The screen is dissected into 16 segments, each equal to 1/16 of a bar in 4/4 time. The lazy rhythm spoken of earlier is obtained by limiting the bar to 12 segments of the bar;
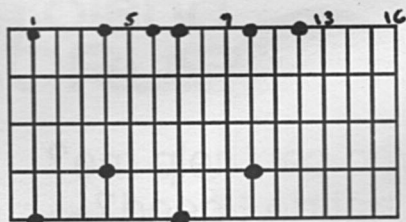
Examples of other types of rhythms are as follows. If your drum machine is not gifted with such a tool as this, why not use a piece of paper and write out the rhythm you want on it, using our graphs as a guide.

To wind up this section of bridge building I would like to remind you of the main points of our discussion. Remember that music making is not some mystical gift given to a special few, it is a skill that most can learn and use with self satisfying proficiency. Keep trying and before you know it the Rift will be gone.

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For the next few months, Softcentre Software will be trying something different. No credit cards etc. – only cheques, postal notes/orders please. However, the benefit to you will be a <u>10%</u> discount on ALL goods!!!!

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Apple //c User's Guide by Lon Poole	28.95
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Sams Introducing the Apple //c	29.95
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The Graphic Macintosh Book	17.95
Winning at the Races Using Your Computer	12.95
Inside the Apple IIe (a best seller)	39.95
Inside the Apple //c (by the same author)	39.95
Basic Business Application Programming for //c ..	33.50
Macintosh Microsoft Basic	35.95
MacPaint Drawing Drafting Design	29.95
Applesoft Subroutine Cookbook	37.95
McGraw-Hill Personal Comp. Prog. Encyclopedia ...	164.95
Applied Apple Graphics	34.95

<u>Software</u> :
New releases from different companies - this month it's First Star and Data Soft.

The Island Caper - sequel to Spy V Spy	39.95
Spy V Spy - better have a good joystick	39.95
Boulderdash - Rockfords Revenge - good reflexes .	39.95
Romper Room's I Love My Alphabet - for the babies	32.95
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Bruce Lee - kick the heck out of the meanies	39.95
The Dallas Quest - put yourself in JR's shoes ...	39.95
Pole Position II - only flags are chequered	39.95
The Goonies - missed the film? try the software .	39.95
Alternate Reality - wizard type adventure	39.95
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Lotus Jazz. Integrated word processing, business graphics, database management, data communications and worksheet.

Microsoft Chart. 42 different charts and graphs for presentations, sales reports and transparencies.

MacBusiness. Gain overall financial control of your small business with this integrated, intuitive accounting program.

Omnis 3 by Blyth Software. Single or multi-user data base manager featuring multiple file management and user definable menus.

PFS: File. Store and retrieve mailing lists, client records, collections, schedules and inventories.

MacProject. Create complex "critical path" flow charts for production schedules, timelines and managing projects.

ThinkTank 512. An idea processor to organise projects, manage details, outline ideas and support decisions.
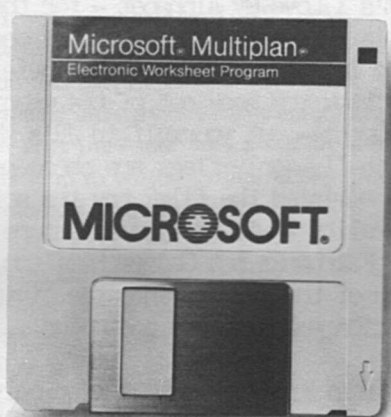
Microsoft Multiplan. Electronic spreadsheet for budget forecasting, business planning and "what if" analysis.
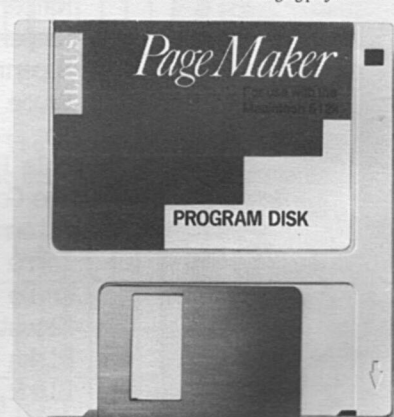
PageMaker by Aldus. Design newsletters, brochures, training manuals, presentations and more.
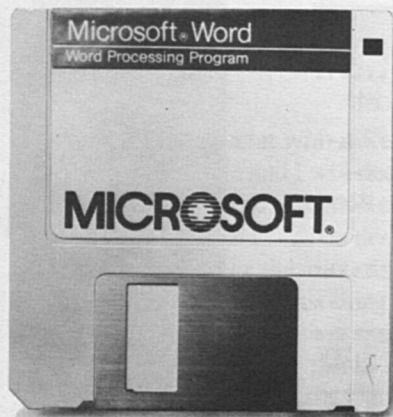
Microsoft Word. Full feature word processor for memos, personalised form letters, reports or any professional document.

AP 177/Palace/L.
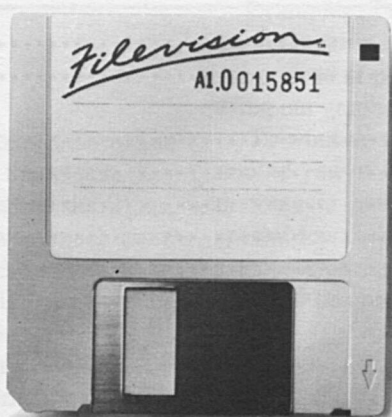
Filevision. Visualise market trends, organise and track sales and present data in pictures.
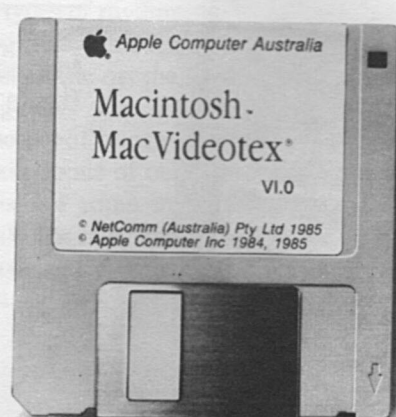
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(We said we'd make you more productive, we never said more popular.)

 Apple

The Best of the Games?

by Gareth Powell

Recently, I had to ask Paul Beaver, the rotund and non hirsute computer guru of Dick Smith Electronics, for the loan of some games programs. Now, understand that Paul is the consummate games person. He knows them, he sells them, he plays them. He has very strong views on what are good games, what are bad games, what are mediocre games. He handed a collection of Apple II games over to me without comment except for some very favourable murmurs about one or two of them.

This is not really a games review written by me. It is more an investigation into why Paul Beaver picked these particular games. Because they were available? Because they were the best of the best? No one is quite certain. What is certain is that the collection is a facinating one.

KAIV

Written by Randal Don Masteller, published by Intelligent Statements.

This program has been around for a fairly long time. I remember the original version when it first came to Australia in 1981. It is a basic adventure game concerning the Warriors of Ras, and it is in the same pattern as all of them. I suppose it is a question of whether you like adventure games or you don't. If you like adventure games this is the sort of program you would like. If you don't you'd probably wouldn't go near it.

Hitchhiker's Guide to the Galaxy

The same is not true of *The Hitchhiker's Guide to the Galaxy*, which plainly is a favourite not only of Paul Beaver but of almost everyone who has played it. On the inside of the cover there are 10 testimonials as to how good the game is. These alone are worth the price of admission:

"The best game I've ever played! But what's the square black flat thing with the hole in the middle?"
Ralph O'Leary, Gym Teacher
Brooklyn, New York

"The disk makes a great teething ring and fits perfectly on the bottom of a bird cage."
Liz Taylor, Highway Patrolman
Piscataway, New Jersey

"A stunning achievement in interactive fiction: funny, innovative, and a bargain at twice the price!"
The New Zork Times

"Your software is revolutionary! I like that."
Havana, Cuba

We have reviewed this game before so there is no need to do so again, but these quotes from first pages of instruction are enough to give you an understanding of how excellent and crazy it really is.

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Black Holes. Savage Alien Warrior Tribes. Welfare planets ruled by dry-cleaning establishments, where even the most basic of human necessities are provided for a day late and with too much starch. Face it, the Universe is **No Place to try and have a good time.**

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Within the million-plus pages of *The Guide,* which in many corners of the *Glaxy* has already supplanted the *Encyclopedia Galactica* as the standard repository of all knowledge and wisdom, you'll find **Everything you need to know about the Universe,** from the utmost trivia to the most vital information pertaining to your health and well-being. **We unconditionally Guarantee** it will teach you how to survive and even **Enjoy the Universe - all on only 30 Altairian Dollars per day!** * Just take a peek at this mere

sample of *The Guide's* **Millions of uses** and, like so many other satisfied customers, you'll be convinced that this is truly **The Most Wholly Remarkable Item you'll Ever Buy!**

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Trivia Buff? *The Guide* has all the answers, as well as most of the questions. For example: What titles comprise Oolon Colluphid's trilogy of philosophical blockbusters? *Answer: Where God Went Wrong, Some More of God's Greatest Mistakes, and Who Is This God Person, Anyway?*

Convention Coming Up? *The Guide* knows where to find all the swankiest hotels, the trendiest restaurants, the swingingest nightclubs, the friendliest escort services and the cheapest duty-free shops in which to buy gifts for appeasing one's family and conscience!

Need Help Fast? In a flash, *The Guide* can supply you with such useful tidbits of information as: how to tell your Aunt Clara from a Seven-Stomached Gorba Plant; what to do if Aunt Clara has been devoured by a Seven-Stomached Gorba Plant; and much, much more!
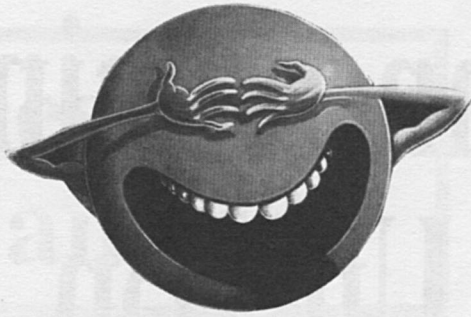
The program is written by Douglas Adams who is responsible for the book *The Hitchhikers Guide to the Galaxy.* Most people who have enjoyed that great book do not realise it started in 1978 as a radio serial on the BBC in England. And that Douglas Adams is a Pom who graduated from Cambridge in 1974 and collaborated on several projects with Monty Python's Graham Chapman and also worked as a writer and script editor on Doctor Who. Almost everyone who has read *Hitchhiker's Guide to the Galaxy* already knows that the answer is 42. But what is the question? Nobody knows. Not even the man responsible for the program, Steven Meretzky, who had the job of turning the inspired nonsense of the *Hitchhiker's Guide to the Galaxy* into a program which works on the Apple II.

In the opening scenario you are Arthur Dent and a bulldozer is preparing to level your house, even as an alien space fleet is preparing to level your planet. After that things get worse.

Here begins a transcript of interaction with the Hitchhiker's Guide to the Galaxy.

>LLOK
I don't know the word "LLOK".
>LOOK
It is pitch black
>VERBOSE
Maximum Verbosity

IT IS PITCH BLACK
>WHERE AM I
You're in the Bedroom
>GET UP
Very difficult, but you manage it. The room is still spinning. It dips and sways a little.
>GO TO THE DOOR
It's here!
>OPEN THE DOOR
It is already open
>GO OUT
You miss the doorway by a good eighteen inches. The wall jostles you rather rudely.
>SWITCH ON THE LIGHT
Good start to the day. Pity it's going to be the worst one of your life. The light is now on.
BEDROOM
The bedroom is a mess. Carpet and old wallpaper. There is a washbasin, a chair with a tatty dressing gown slung over it, and a window with the curtains drawn. Near the exit leading south is a phone. There is a flathead screwdriver here. There is a toothbrush here.
>PUT ON THE DRESSING GOWN
You're not holding your gown
>GET GOWN
Luckily, this is large enough for you to get hold of. You notice something in the pocket.
>LOOK IN THE POCKET
It's hard to open or close the pocket unless you're wearing the gown.
>PUT ON THE GOWN
You are now wearing your gown.
>LOOK IN THE POCKET
Opening your gown reveals a thing your Aunt gave you which you don't know what it is, a buffered analgestic, and pocket fluff.

Where in the World is Carmen Sandiego?

Those of us who have been to the Philippines will feel they have a complete answer to *Where in the World is Carmen Sandiego?* She is working as a go-go dancer in Bubbles in Avenue MH Del Pilar in Ermita in Manila.

That however is not the correct answer to the question *Where in the World is Carmen San Diego* which is a Apple game from Broderbund. Any game from Broderbund is likely to be of the highest possible order. This is true about *Sandiego*. The package contains the *World Almanac and Book of Facts* which is published by the newspaper enterprise foundation in New York. This book is 928 pages long and is set in the smallest legible type in existence. We think it is six point gibberish but it is certainly impossible to read unless you are a) young and b) have 20/20 vision. Luckily you don't have to read the book to play the game. It is just there in case you get desperate.

Where in the World is Carmen San Diego is written by Dane Bigham, Gene Portwood and Lauren Elliot. The publishers call it a mystery exploration game and that precisely is what it is. It is cast rather in the mould of the novels by Raymond Chandler.
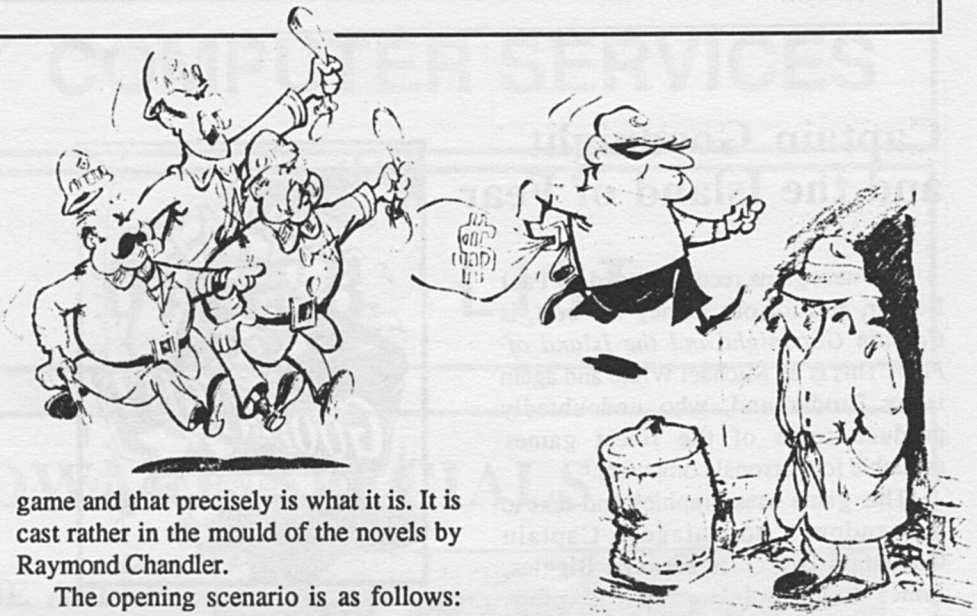
The opening scenario is as follows: "Monday 5.00am. A ringing sound jars you awake. You grope for the phone and drop the receiver on the floor. Out of the darkness comes the voice of your boss 'Wake up, kid. Got an assignment for you.' You stumble out of bed, turn on the light, and grab your brand new detective's notebook."

You set off to find that you are chasing Carmen Sandiego's gang which has stolen the torch of the Statue of Liberty. You find that you have to chase the gang right through all the capitals of the world.

In each city you see a well known landmark or monument and you're briefed on the local geography and culture. As you explore the city you unearth clues to the crooks' identity and many clues you will understand right away. Others you will have to look up in the World Almanac of Facts.

By the time you finish running through this game you'll have, a) enjoyed yourself and b) learned a lot more of the world around us. Because there are ten possible suspects, thirty cities and very nearly 1000 clues. The game changes every time you play it and works as an entertainment machine and as a trivia tutor.

Incidentally, it is our opinion that Carmen San Diego is innocent.

TOKYO
Monday, 9 a.m.

Tokyo is the largest city in Japan, with a population of about 8.3 million people.

See connections
Depart by plane
Investigate
Visit Interpol

ISTANBUL
Monday, 2 p.m.

Museum guard:
A reliable source told me he said he planned to study Arabian gazelles.

See connections
Depart by plane
Investigate
Visit Interpol

Captain Goodnight and the Island of Fear

The next game recommended by Paul Beaver, and for our money the best, is *Captain Goodnight and the Island of Fear*. This is by Michael White and again is by Broderbund, who undoubtedly produce some of the finest games available for personal computers.

This game uses graphics and text to tremendous advantage. Captain Goodnight is a cross between Biggles, James Bond and Hannay. He keeps finding himself up against that renowned naughty person Doctor Maybe of the Federation of Evil. This time the Doctor has devised a doomsday machine and is threatening to destroy the entire civilised world. The machine is hidden in the underground Federation of Evil headquarters, Doom Island, and the free world is being blackmailed by the naughty doctor.

With the game you get a code descrambler, a circular disk guaranteed to decipher any code providing it doesn't drive you mad first. There is also a map and a mission briefing.

You play the game either with a keyboard or a joystick but it works infinitely better with a joystick because you can speed it up when you get to any parts where you feel you're in command of the situation. The game has its tongue firmly in its cheek but at the same time puts you into the situation where you need to use intelligence and skill to survive. Captain Roscoe does "Buzz" "Goodnight Cap" is not perhaps the most endearing hero in computer games. But he must be very near it. Captain Goodnight and the Island of Fear is very nearly the ultimate that can be achieved with current technology on computer. The next big breakthrough is going to be the use of the video images. That can't be far away.
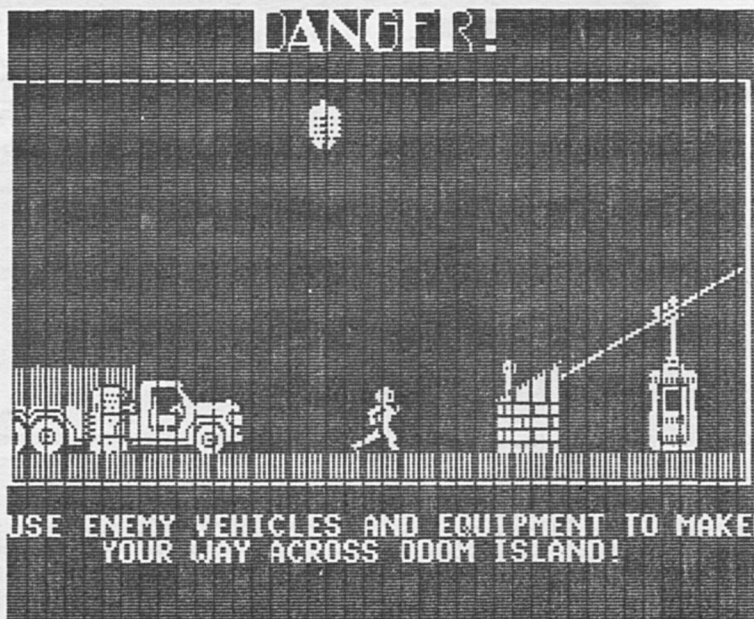
The Ancient Art of War

Finally *The Ancient Art of War*. This is available on the Macintosh but not as far as we know on the Apple II yet. Paul Beaver has in fact stopped playing this game because he has got to the stage where he will nearly always win.

The idea is you start off by selecting a role for yourself. You can be one of the great military minds of all time. Julius Caesar, Genghis Khan, Sun Tsu and so on. You find yourself in battle against some historic opponents who use quite authentic military strategies. You can zoom into any area of the battlefield and direct your forces as best you may. When you and the enemy meet there is animated conflict. We have run this game on an IBM in order to see it in colour.

We have yet to find anybody who sees the *Ancient Art of War* who does not become instantly and totally addicted. This is the intelligent version of *Captain Goodnight*. It is, in the main, historically accurate. It adopts the personalities of genuine historical figures and conducts the battles according to their known methods and biases. It depends on the intelligence and foresight of the player rather than skill in pressing buttons. It is, we promise you, totally addictive.

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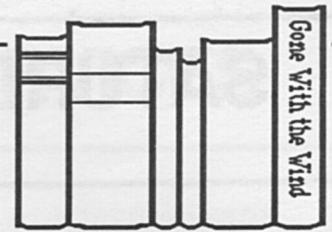
Bookshelf

by Gene Stephan

This month's books have proved to be a mixed bag, with some good meaty prose garanteed to keep your soldering iron hot, a couple of "manuals", and a book to help sooth the savage micro. Are they all great? Well... I for one have stopped waiting for miracles.

Title: Music for the Apple II

Author: Thomas Rudolph
Publisher: Unsinn (through Dorian Music, Qld)
Size: 21cm by 28cm by about 175 pages
Cost: $29.00

As an ex-editor of this illustrious publication, I have felt the pangs of horror over the last few months when seeing the number of words devoted to of all things, music on the Apple. To certain people, the rhythm of the dot mat is as near to Beethoven as they would care to go, and the sound of a head seek as delicate as a scale. In other words, if people want to waste time with music, they should get a stereo and not an Apple.

I daresay many would disagree with this viewpoint and draw my attention to the number of chips getting warm in recording studios. And point to the number of Apples in education. If you are one of those people, and particularly if involved in education, then here is a book for you.

Music for the Apple II was written by a music teacher in a little US town by the name of Haverfor, who found his courses scrapped due to lack of student interest. Probably because of an aversion

to hunger, he decided to introduce a course in music theory using a micro. The ending is predictable - his enrollments increased and he wrote this book.

Bearing the background in mind, the book is excellent as it provides a teacher with a comprehensive sourcebook of tested ideas and references on how to use an Apple for music.

Unfortunately, Chapter 1 - Microcomputer Basics, contains material most readers would have probably seen elsewhere. The chapter explains what K are and why they are important, and why there is a disk drive and not a trumpet attached to the Apple. However, from here on the content becomes much more useful.

Chapter 2 - Apple II Sound Production, deals with the Apple speaker and digital (from the Apple) to analog (to the amplifier) conversion (DAC). It was at this point in my reading of the book that I changed my mind and decided it was good and not a waste of time. Throughout, the author qualifies what is said with lists usually of advantages AND disadvantages . This gives a rank beginner direction in what to look for in hardware/software or when actually teaching. Figure 1. from this chapter is an example.

The book has a further eight chapters which deal with: Chapter 3 - Music Education, Chapter 4 - Music Learning Applications, Chapter 5 - Music Systems, Chapter 6 - MIDI (Musical Instrument Digital Interface), Chapter 7 - Developing a Course of Study, Chapter 8 - Administrative Applications, Chapter 9 - Interfacing and Telecommunications, Chapter 10 - Programming, General Care & Proposal Writing, and ending with 21, appendicies which source hardware from interface boards to video disks, and

DAC Board Advantages

- A DAC board in conjunction with a speaker produces better sound quality than the Apple speaker.
- Intonation is more accurate with the DAC board.
- Multiple voices can be produced.
- DAC boards may be easily adapted for headphones.
- Overall sound quality is superior to anything produced by the Apple II speaker alone.

DAC Board Disadvantages

- Software is not compatible among various brand of DAC boards.
- DAC boards do not all have the same number of voices.
- The cost of the DAC board does not include the price of the external speaker.
- DAC boards may also require an amplifier.
- Equipping each microcomputer with a DAC board is costly.

The following are ways to utilize a DAC board:

- To produce multiple voices for music theory drill and practice.
- As a multi-voice composer.
- To produce multi-track recordings and live sounds.

software from wordprocessing to marching bank programs.

So overall, the book would rate at the top of a "useful" catagory for someone interested in, or teaching music (particularly if the class is shrinking and the job is threatened). The main shortcomings of the work as I saw them, were that the book is beginning to be dated (published 1984) and referrences are to US companies. However, looking at Ric Richardson's articles, I take it theMIDI is still around, and the teaching ideas certainly will not suffer with time.

Title: Structured MS Basic for the Macintosh
Author: J.N.P. Hume &
R.C. Holt
Publisher: Reston (Prentice Hall)
Size: 17.5cm by 23cm by about 350 pages
Cost: $36.50

Leaving the music and going to the manuals brings us to the next title. I use the word "manuals" as such books usually do no more than reiterate the text accompanying software, probably for the benefit of shy people who have walked out of the shop after having made their purchase, have left the manual behind and are too embarrassed to go back and get it.

Structured MS Basic for the Macintosh could fall into this category, but would be better described as a straight text book. After reading Chapter 1 - Introduction to Structured Programming, I felt there was something familiar in the final pages being a chapter summary. The feeling was substantiated by summary and EXERCISES at the end of Chapter 3 - Getting the Computer to Calculate and Output. And, total certainty when a thorough search of the book revealed no answers and a Preface which said self study or text.

As a text book, *Structured MS Basic for the Macintosh* is very good but does not possess boundless patience. For example when talking about mathematical graphics, the book says, "This program uses trigonometry. If you do not understand it, never mind; you can use it anyway." Warming words which really say how little has changed with texts since the Dark Ages.

While the background explanations may be lacking, when it comes to the programming, the explanations are all there - terse and precise. "The color is, of course, either white, which has a value of 30, or black which is 33. To plot a point in the upper left-hand corner of the Output window we use PSET (0,0). The size of the point plotted is one pixel by one pixel; it is a square. If we omit the color it is, by default, black..." Not passages designed to start any romance with your Macintosh, but getting an accurate message across.

There are 19 chapters all up, dealing with every aspect of Microsoft Basic with examples and exercises. And, as a good text on programming, it goes further than a manual which itemises what each reserved word means, and teaches how to string code together. For example, Chapter 7 - Structuring Control Flow, deals with such things as flow charts, loops and problems with them, while Chapter 10 - Program Design is devoted to just that, program design, with example programs in most chapters (Figure 2).

Can the book be recommended? The answer is a qualified yes. My feeling when I finished the book was that as a text in a class situation it was very good. For self-study however, it appeared to lack the tutorial style necessary. I felt that in this situation for maximum benefit could not be reassuring just to see your answers are in fact correct. The lack of feedback from the book and the clinical style would be balanced by a room of people, but by a solitary Macintosh? Doubtful.

Figure 2

```
The Complete Program
REM PROGRAM sort
'Sort list of n names alphabetically
DIM person$(100)
'Input name list of persons
INPUT "List length =",n
PRINT "Enter",n;"names one to a line"
FOR i =1 TO n
   INPUT person$(i)
NEXT
'Swap elements of list until sorted
'Loop with last varying from n to second
'Swap elements so largest value is last
FOR last =n TO 2 STEP - 1
   'With i varying from first to last - 1
   'if element (i) > element (i+1)
   'swap these elements
   FOR i =1 TO last - 1
   IF UCASE$(peron&(i) >
   UCASE$(person$(i+1)) THEN &
   SWAP person$(i),person$(i+1)
   NEXT
NEXT
'Output sorted name list
PRINT "Here is the sorted list"
FOR i =1 TO n
   PRINT person$(i)
NEXT
END
```

Structured MS Basic for the Macintosh

Title: The Apple Writer Wordprocessing Book: Applications for the Apple II/IIe.
Author: C.J. McMullan, C.M. Lehman & M.W. Lehman
Publisher: Reston (Prentice Hall)
Size: 21cm by 28cm by about 340 pages
Cost: $47.50

The review of this title will be somewhat incomplete as I believe there are two additional parts to this work, namely an instructor's manual and a training disk (available separately, of course).

The Apple Writer Wordprocessing Book is a set of exercises divided under three broad headings.

Part One - Operations, deals with basics ranging from where the keyboard is on the Apple to a rundown of the standard wordprocessing commands under Apple Writer and how to use them, Part Two - Wordprocessing Applications, goes into fancier aspects of wordprocessing such as the use of various formats in documents, reports and tables, and Part Three shows the advanced features and the use of Quick File II (for IIe).

The book is in tutorial form and would primarily have appeal to the secretary or the typist in a small business. The bias in the examples is towards business letters, medical reports and accounting

formats rather than anything else, and the Apple is in some ways treated as little more than a glorified typewriter.

However, with the alleged training disk, *The Apple Writer Wordprocessing Book* can be of value in high schools or colleges considering teaching word-processing on Apples. The reason here is that there is enough in the early chapters to foster an awareness of the computer, a set of very well graded exercises through all parts of the book and a disk which allows the students to concentrate on wordprocessing techniques rather than spend the majority of the time keying in text and the minority of the time manipulating it.

My major criticisms of the book are two fold. The first is simple - the price is too high. For $47.50, I would have liked to have had the disk as well. But then again, maybe I'm just being greedy.

The second criticism is that the book is full of Americanisms. Formats, dates and spellings are not as ours, and this would mean some reworking of the excercises before making them available, particularly to younger students.

Title: Apple Instrumentation & Control - Circuits & Software
Author: Jerome Oleksy
Publisher: Reston (Prentice Hall)
Size: 17.5cm by 23cm by about 175 pages
Cost: $47.50

This brings me to the last book and probably the most interesting for this month, though look at the price. Certainly a discouragement though the book is well worth it for anyone keen to experiment and build, as the book can easily be used as a reference to a number of chips and interfaces.
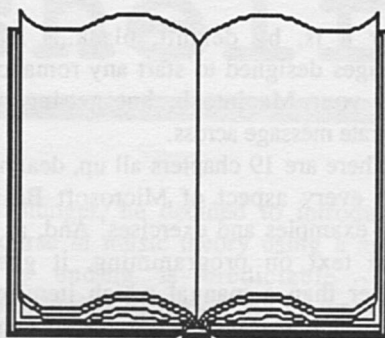
The first thing about *Apple Instrumentation & Control* is that it does not duplicate the manuals. Very early in the book this is made clear, "We will indicate which signals are to be used for each project and which memory addresses to use. You should keep the reference manual handy..."

Chapter One - Introduction to Apple Interfacing, gives a pinout of the Apple II's slots and describes the signals and their status - what they are and whether they are active low or active high. Chapter Two - Parallel I/O, describes the memory locations and the chips involved when passing or receiving data in 8 bit bytes where all 8 are transmitted at the same time.

From Chapter Three - Interfacing Power Control Devices, suggestions for projects start to flow. The book is not step-by-step, do-it-yourself, interfacing.

Rather it gives the information and the ideas and leaves you to do the rest. For example Figure 3 shows two figures from the book illustrating a solid state relay (SSR) and the connections and use to which this could be applied - switching on a light. The book also gives the code, or describes how to write the code to achieve this.

The remaining chapters are: Chapter Four - Interfacing to Analog Inputs, including single input A/D conversion, Chapter Five - Structuring Your Applications Programs, Chapter Six - Using Basic and Machine Language Effectively, Chapter Seven - Using the Computer as a Strage Scope, Chapter Eight - Using the Computer as a Waveform Generator, Chapter Nine - Serial I/O, including a description of the RS 232C, and Chapter Ten - The IEEE 488 Bus, including an overview and connection to the Apple.

To sum up on this one, I would say *Apple Instrumentation & Control* is a book which would be well used by someone keen to extend the uses of their Apple. Those who read *Byte* magazine from the US would know Ciarcia's Circuit Cellar column. *Apple Instrumentation & Control* verges towards that, leaving more for you to do, but at the same time making it easier by using the Apple as a basis.

However one final word of caution based on painful experience - if in doubt, don't switch it on. An incorrectly wired interface board is one of the surest ways to cook your Apple and on the other side of the interface, don't forget the US only uses 120V.
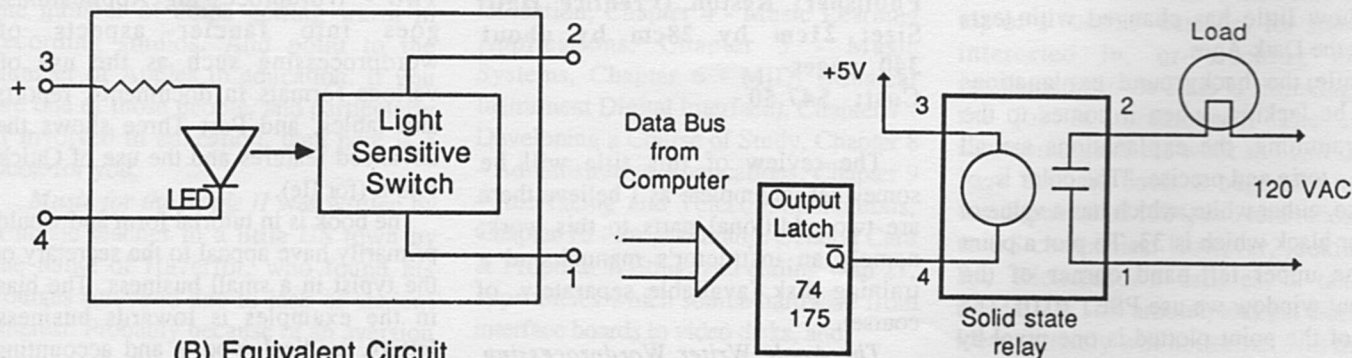
(B) Equivalent Circuit

```
]LIST 700,1999

700    REM   *** PLOT AXES ***
701    REM
710    FOR X = 0 TO 250 STEP 10
720    HPLOT X,159
730    NEXT X
740    FOR Y = 0 TO 160 STEP 10
750    HPLOT 0,Y
760    NEXT Y
770    RETURN
799    REM
800    REM     *** USER INPUT ***
801    REM
810    INVERSE
815    VTAB 23
820    PRINT "HIT SPACEBAR FOR NEW
       TRACE"
830    PRINT : PRINT "TYPE R FOR
       REALTIME GENERATOR"
840    GET A$
850    PRINT : PRINT : PRINT
860    NORMAL
880    RETURN
899    REM
900    REM   *** GET WAVEFORM CHIOCE ***
901    REM
910    TEXT : HOME
920    PRINT : PRINT   TAB( 6)"*** WAVEFORM GENERATOR ***": PRINT
930    PRINT "WAVEFORM TYPES": PRINT "-------- ---- ---"
940    PRINT   TAB( 10)"(1)   SINEWAVE":
942    PRINT   TAB( 10)"(2)   TRIANGULAR WAVE"
944    PRINT   TAB( 10)"(3)   RECTANGULAR WAVE"
946    PRINT   TAB( 10)"(4)   COMPLEX WAVE"
948    PRINT : PRINT   TAB( 10)"(0)   EXIT PROGRAM"
950    PRINT : INPUT "CHOOSE ONE  ==> ";CHOICE
960    IF CHOICE = 0 THEN 990
970    IF CHOICE < 0 OP CHOICE > 4 THEN 900
980    RETURN
990    HOME : VTAB 10: PRINT "GOODBYE FOR NOW": END
999    REM
1000   REM   *** SINEWAVE CALCULATIONS ***
1001   REM
1010   MEM = BUFFER
1020   PRINT "PEAK-TO-PEAK AMPLITUDE? (0-5V)"
1030   INPUT A1
1040   FOR T = 0 TO 360 / 57.2958 STEP 360 / 5729.58
1050   V = 127 + 25.4 * A1 *   SIN (T)
1060   V =   INT (V)
1070   POKE MEM,V
1080   MEM = MEM + 1
1090   NEXT T
1095   RETURN
1999   REM
2000   REM,  *** TRIANGULAR WAVE CALC ***
2001   REM
2010   MEM = BUFFER
2020   PRINT : INPUT "MAX AMPLITUDE? (0-5V)";V1
2030   INPUT "ENTER % POSITIVE DUTY CYCLE (1 TO 99)";P
2040   VM = V1 * 255 / 5
2045   REM   * POS SLOPE CALC *
2050   FOR N = 0 TO P
2060   V = VM * N / P
2070   POKE MEM,V
2080   MEM = MEM + 1
2090   NEXT N
2095   REM   * NEG SLOPE CALC *
2100   FOR M = 1 TO 100 - P
2110   V = VM - VM * (M / (100 - P))
2120   POKE MEM,V
2130   MEM = MEM + 1
2140   NEXT M
2150   RETURN
2999   REM
3000   REM   *** RECTANGULAR WAVE ***
3001   REM
3005   MEM = BUFFER
3010   PRINT : INPUT "ENTER POSITIVE DUTY
       CYCLE (1 TO 99)";DUTY
3020   INPUT "MAX AMPLITUDE? (0-5V) ";A1
3030   V1 = A1 * 255 / 5
3040   FOR N = 1 TO DUTY
3050   POKE MEM,V1
3060   MEM = MEM + 1
3070   NEXT N
3080   FOR M = DUTY + 1 TO 100
3090   POKE MEM,0
3100   MEM = MEM + 1
3110   NEXT M
3120   RETURN
3999   REM
```

The Worm in the Apple

THE PUBLISHER and editor of this august journal has received a letter of complaint which, it has been suggested, was initiated by senior executives in the stately pleasure dome in Ryde. The theme of the letter was that the Worm was upsetting them with comments which certain members of staff felt applied to them.

This humble and obsequious worm does not seek to upset anyone. Therefore, from now on, I will not write about any person who is employed by Apple in Australia. I have gone back and read every word that I have written in this journal in the past two years and, in truth, I find nothing that is objectionable. But worms are notoriously thick skinned than humans. If I have upset members of staff of Apple in Ryde then I am sorry. Mea culpa, mea maxima culpa. No more will this worm discuss with admiration and bated breath the activities of the staff of that stately pleasure dome. Indeed I will stop referring to it as a stately pleasure dome. It won't sound the same when I say "their offices in Ryde" - but anything for a
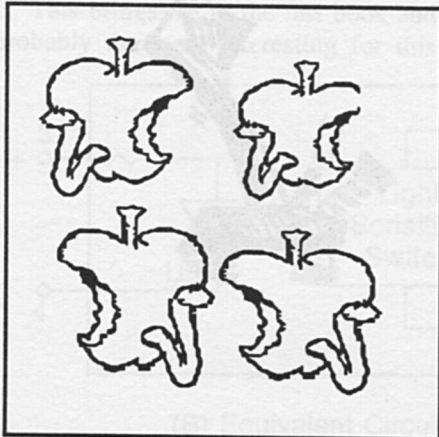
quiet life. The publisher and editor of this august journal when he read the letter was more than somewhat upset. He has passed on that perturbation to me and has inflicted on this Worm's column a system which can only be described as censorship.

This is the first of the Worm's column in new censored format.

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At the PC 86 show at Centrepoint this humble Worm managed to crawl into one of the many demonstrations given by William Gates the Third, founder and head of MicroSoft, of the amazing program *Windows*. It was all razzle
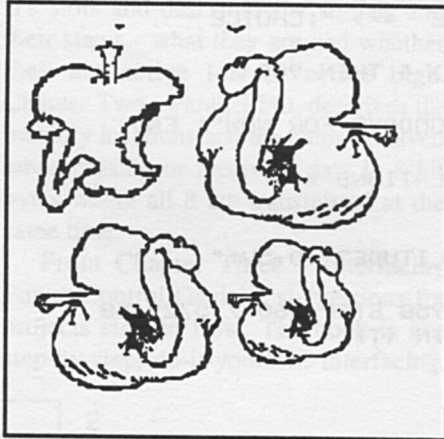
dazzle, fast movement, colour and light. Very impressive. After listening most carefully to the peroration, I came to the inescapable conclusion that what *Windows* is, about - and this was also true of the Gem program from Digital - is to make the IBM function as well as the Macintosh. It is most interesting to see that in fact this is an impossible task

and can never be properly achieved. Not with the present CPU in the IBM. The 8088 chip is slow, relatively unintelligent, and more than somewhat outdated. In listening to Bill Gates one realised that his program *Windows* was not written for the standard IBM 8088, it was written for the AT. As the young and super intelligent Mr Gates is very involved with IBM we can take it that the 801286 chip is going to be the standard throughout the line in the very near future.

It is most flattering for Apple to see so many efforts being made to make other computers as easy to use and as powerful as the Macintosh. It is this Worm's humble opinion that Apple did not do the right thing when they took legal action against Digital because, in Apple's opinion, the Icons used in Gem were too much like those used by the Macintosh.

No one will argue that this was not so. But it might have been possible for Apple to encourage Digital to make them even more like the Icons on the Macintosh. And by doing so they would have created an industry standard. An industry standard which, effectively, Apple controls because they were first cab off the rank. (It would be wrong and churlish of Worm to point out that the whole concept of Icons came not in fact from Apple but from the Palo Alto research centre run by Xerox. Churlish indeed).

The amended Gem by Digital is still enough like the Mac desk top to be recognisable, but not enough like it to be considered to have a joint industry standard. Which many might consider a pity. Because the machine that sets the standard very frequently gets the market shares.

Jack Trameil, the head of Atari, introduced the Atari 520ST with Gem built in. He said it was not in any way a copy of the Macintosh desk top, but merely used the "desk top environment". Which appears to this Worm to be splitting hairs. The fact is the Macintosh

UNMITIGATED GALL

method of operation is being accepted very widely as being the way to go.

This worm has had in his possesion for some time an Atari 520St and has been able to compare it to the Macintosh. In truth, it is not in the same league. First of all there is a desperate shortage of programs. Secondly the desk top does not work as well or as quickly. Thirdly the machine is simply not as well built. True, it is cheaper - but not by much. True, it has an integral full colour screen. But the Macintosh will soon have that. Nevertheless, this machine along with the Commodore Amiga represent the future opposition around the world. Both of them use the Gem interface. Both of them have pull down screens, desk tops and icons and mice. Exactly the same as the Macintosh.

In advertising it is a well known truth that "Me Too" products never make a major impact on the market. And I think this is going to be true of the Amiga and the Atari. No doubt they both have excellent facilities. No doubt they are being sold at a competitive price. But they do not truly compete with the Macintosh because they lack the quality of construction, the elegance of programming and the immense range of available programs. All these three machines share in common perhaps the Motorola 68000 chip and the desk top environment. It will be interesting to see in the next few months the way in which
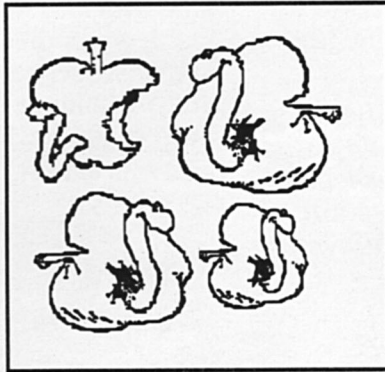
the market share in the United States and the market share in Australia is apportioned.

Far more of a threat to the Macintosh is the extended, amended and updated IBM JX. About which this Worm has a most curious tale to tell. I first got to learn about the IBM JX when I was contacted by my cousin Watanabe Worm in Tokyo to tell me that a new, cheap and interesting IBM was on sale. This machine had a built in capability for Japanese characters, contained a 3.5 inch disk drive from Sony which used double sided double density 720K disks and had a cartridge socket.

Lo and behold the machine was released in Australia last year by IBM with a subdued fanfare of trumpets specifically for the education market. On close inspection it could be seen the disk drive now on the offered 360K of memory and only worked with single sided disks. This Worm, being of a nosy and inquisitive nature, took one apart and found out that the mechanism had been modified so that recording was only done on every other track. The reason for this was difficult to fathom. IBM - following a tradition as old as the hills - were saying nothing. The best explanation I was able to find was that IBM wanted all programs from the IBM PC to copy directly onto these new disks. As the IBM PC used 5.25 inch disks which only held 360K of information the new disks were mechanically fixed so that they would keep completely in step. This process is known as a Diskoid Lobotomy.

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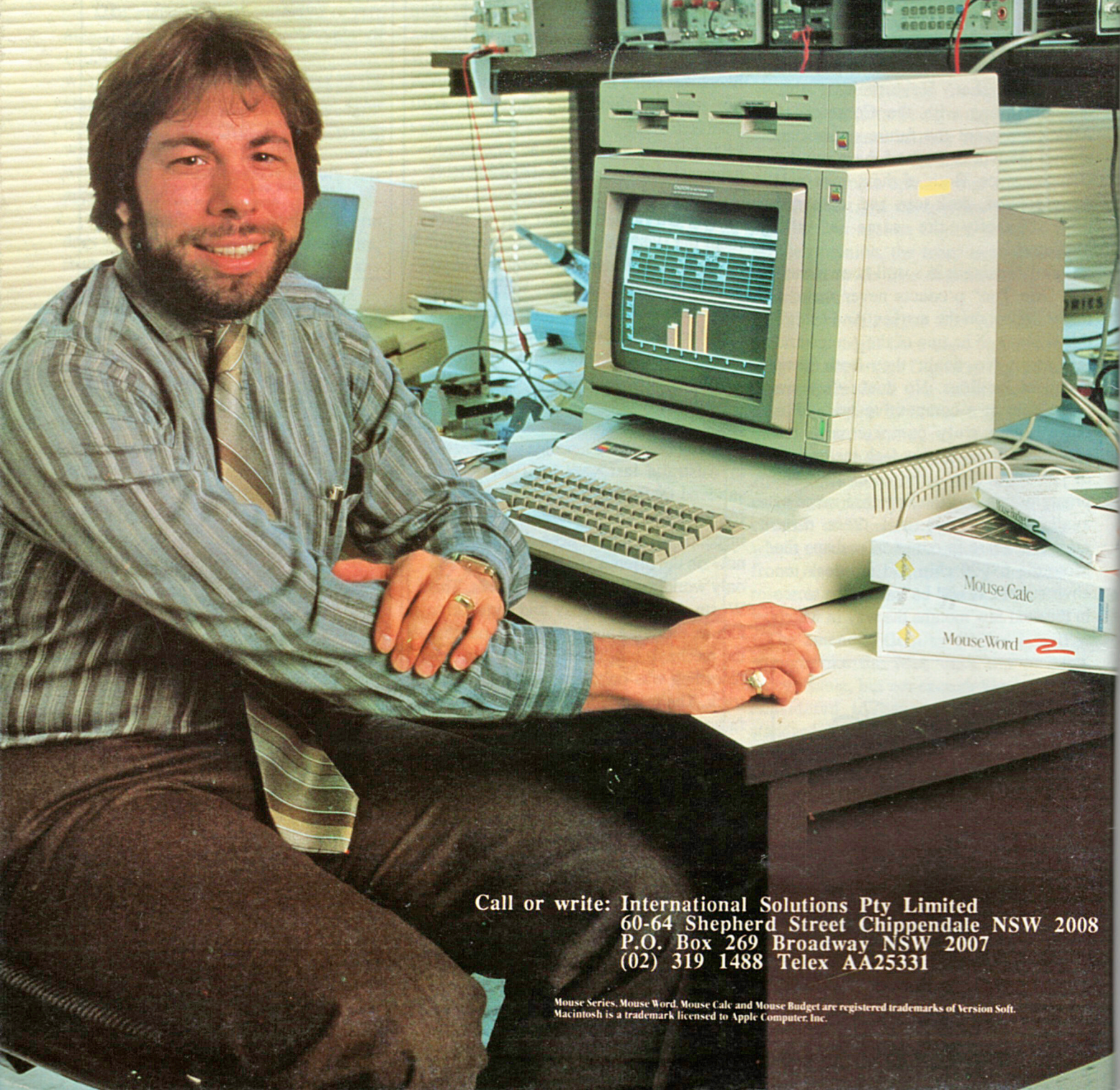
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