Vol 1 No 9
ISSN 0112-2991

$1.50

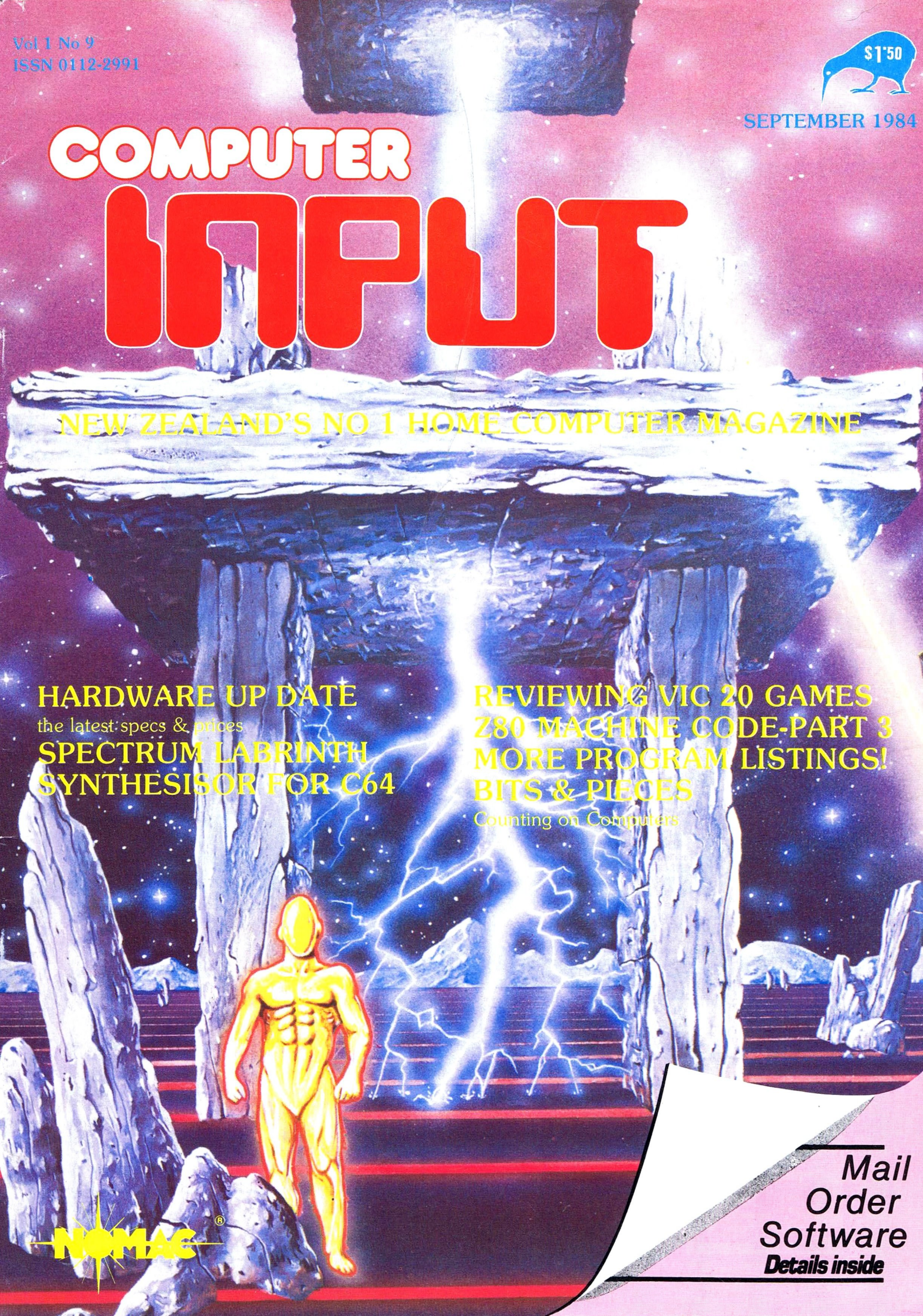
SEPTEMBER 1984

COMPUTER INPUT

NEW ZEALAND'S NO 1 HOME COMPUTER MAGAZINE

HARDWARE UP DATE
the latest specs & prices
SPECTRUM LABRINTH
SYNTHESISOR FOR C64

REVIEWING VIC 20 GAMES
Z80 MACHINE CODE-PART 3
MORE PROGRAM LISTINGS!
BITS & PIECES
Counting on Computers



Mail Order Software
Details inside

take a look at the exciting new releases from the growing range of SINCLAIR SOFTWARE

AVAILABLE ON CASSETTES OR ROM CARTRIDGES

JET PAC
You'll have to be quick on your lasers. Fast and action packed space travel.
SPECTRUM – Rom Cartridge
CX5306 **$79.95**

PSSST!
What's up in the garden? Will you and Robie save your prize crystals from the hungry insects?
SPECTRUM – Rom Cartridge
CX5307 **$79.95**

EARLY PUNCTUATION
One in a series of six programmes designed to make learning an enjoyable and interesting affair. While an animated match stick man marches above displayed sentences the child decides what punctuation mark is missing and where to insert it. A correct sentence results in some light relief in the form of a bottle shooting game.
Cassette
SPECTRUM 48K – Cassette
CXE19 **$44.95**

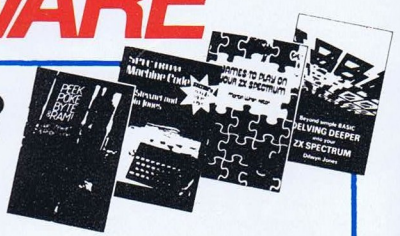
SUPER PROGRAMMES 4
This versatile programme tape contains six totally separate fun filled games.
- Down Under • Submarines
- Doodling with Graphics
- The Invisible Invader
- Reaction • Petrol

ZX 81 (1K) — Cassette
CS33 **$19.95**

REVERSI
Test your skill against a programme which has been described as having "Artificial Intelligence". Nine variable skill levels and full play back facility. 16K and ZX 81.
ZX 81 (16K) — Cassette
CZ56 **$19.95**

GALACTIC ABDUCTOR
An exciting game in 100% machine code. Defend your satelites against the ferocious space hawks. Even your laser can't kill them instantly. The giant birds weave, drop their eggs on your planet and capture humanoids.
Be careful, if the hawks don't get you what's in the eggs will!!!
SPECTRUM 16K — Cassette
CXS2 **$29.95**

SINCLAIR BOOKS



GAMES TO PLAY ON YOUR ZX SPECTRUM Martin Wren-Hilton
These games are designed to test your faculties and the Spectrums facilities to the full.
Also included are a couple of programmes to help you write your own games.
BK157 **$6.95**

DELVING DEEPER INTO YOUR ZX SPECTRUM D Jones
When you have mastered, Introductory Programming on the Spectrum, you need this outstanding guide to Enhanced Programming Techniques.
BK611 **$27.95**

PROGRAMMING YOUR ZX SPECTRUM Hartnell & Jones
Your ZX Spectrum is a powerful computer and this book will help you make the most of it.
From first principles right through to quite complex programming.
BK162 **$24.95**

THE ART OF PROGRAMMING THE ZX SPECTRUM M James
Whether you are fairly new at computing or a seasoned programmer you are likely to have a lot of questions on the theme of "How can I programme the Spectrum to do . . . . .".
This book is designed to give some of the answers. 16K and 48K.
BK154 **$7.99**

EASY PROGRAMMING FOR THE ZX SPECTRUM Stewart & Jones
The next in the series from Peek, Poke, Byte and Ram. We take you beyond to the realms of machine code programming.
BK160 **$19.95**

PEEK, POKE, BYTE AND RAM! Iain Stewart, Robin Jones
This friendly guide has been designed just for you. Your ZX 81 contains everything from plugging in, to de-bugging.
BK162 **$17.95**

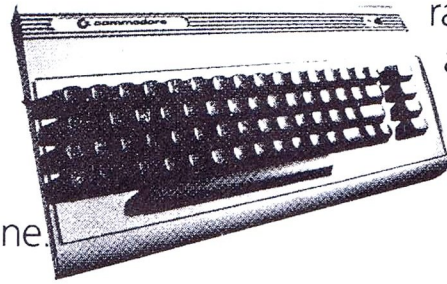
AVAILABLE FROM 200 COMPUTER DEALERS NATIONWIDE!

IMPORTED & DISTRIBUTED BY:
DAVID REID ELECTRONICS LIMITED
C.P.O. Box 2630, Auckland, New Zealand. Telephone: (09) 488-049.

NORRIE 1878

Who's keeping up with Commodore?

The Commodore 64 is designed and priced so that you can pile on the peripherals. Like a disc drive, printer and even a printer plotter. You can own the Commodore 64 AND disc drive and printer for little more than you'd pay for many other computers alone.



With 64K memory, outstanding colour graphics, a music synthesiser to rival the professionals, a fantastic range of games cartridges and full upper and lower case keyboard. It's outstanding!

C= commodore COMPUTER

COMMODORE COMPUTER (N.Z.) LTD
P.O. Box 33-847, Takapuna, Auckland
Telephone 497-081

Please send me more information on the Commodore 64™

Name _____

Address _____

_____

Mail Order SOFTWARE

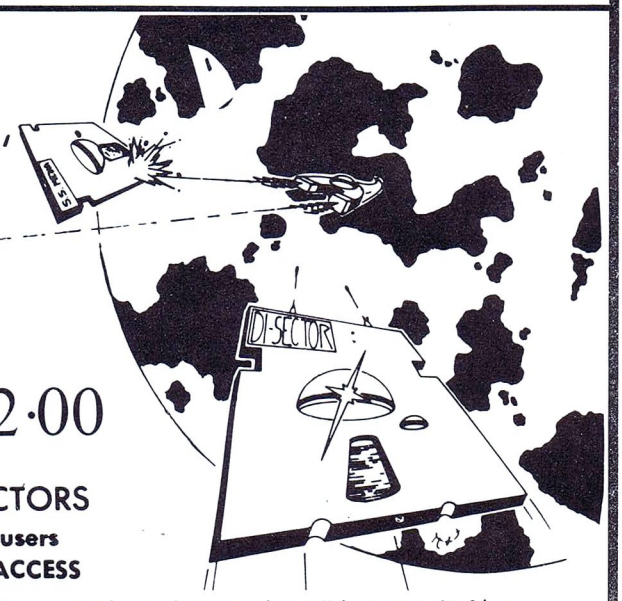
RICKLEY Industries Ltd

P.O. BOX 7259, WELLESLEY ST., AUCKLAND.

DI-SECTOR

'To The Rescue'

REPAIR - CUSTOMIZE - LEARN



from

STARPOINT SOFTWARE $172·00

AT LAST!! DIRECT INTERACTION with SECTORS

an absolute necessity for disk-based Commodore 64™* users

EXAMINE, MODIFY, and RESTORE by DIRECT SECTOR ACCESS

- ★ simultaneous HEX and ASCII display of sectors
- ★ dual cursor editing
- ★ modify in HEX, ASCII or DECIMAL
- ★ restore scratched/deleted files
- ★ repair lost, damaged, or "destroyed" files
- ★ complete operating instructions
- ★ many useful data recovery and modification tips
- ★ source code fully commented by author

BACKUP YOUR ENTIRE DISK LIBRARY QUICKLY AND EASILY

- ★ Fully automatic 3 pass backup of protected software.
- ★ SUPER FAST direct or allocation backup of standard format disks
- ★ Copy files

1541 DISK DRIVE ALIGNMENT PROGRAM

C. S. M. SOFTWARE

$189·95

For those of you who have had your disk drive beat out of alignment, you may be interested in the disk drive alignment program. This disk drive alignment program requires no special equipment. No oscilliscope, no strobe light and most importantly you don't have to be a electronics wizard to use this program. The program is contained on one disk and a specially prepared calibration disk is supplied with the program. The calibration functions appear on your TV or monitor screen. Also included are instructions for a 'fix' that has prevented many disk drives from ever going out of alignment again. If you have not had your disk drive beaten out of alignment, just wait. Your turn is coming!

The latest software for Computers

Commodore 64, Spectrum, Sega, VIC 20 and ZX81

RICKLEY Ind. Ltd

How to order

Simply fill in the relevant sections on the order form Note that there is no postage or packing to pay on purchases. Please allow 28 days for delivery.

SPECIAL OFFER

Members special discount prices.

*I enclose a cheque/postal order

*Please charge to my Visa/Bankcard Expiry Date.....

*Delete/complete as applicable

Signature

Mr/Mrs/Miss

Address

(Please print)

WHATEVER YOUR TASTE...

EDITOR:
ASHLEY NOBLE

PRODUCTION:
ERIC McCALL
JOEL NIELSEN

ADVERTISING:
JACK NOBLE

COLUMNISTS:
TOM CHERRIE
OLWEN WILLIAMS
BRIAN BROWN
MARTIN HALL
FAYE HALL

PUBLISHED BY:
NOMAC PUBLISHING LTD.

TYPESETTING & PRINTING BY:
CLARK & MATHESON LTD.

DISTRIBUTION BY:
GORDON & GOTCH (NZ) LTD.

COMPUTER INPUT MAGAZINE
P.O. Box 39-278
Auckland West.
Telephone: 496-943

ARTICLES

We would be happy to receive any kind of material about home or micro computers. Please contact us about rates for articles.

We will receive programs in almost any form (though preferably computer printed or on cassette). We will return cassettes.

If return of material is desired, then please say so and we shall do our utmost to return the copy in the condition it was received. (Please at all times, include your name and address, and if possible, your phone number, on all submissions).

SUBSCRIPTIONS:

Have "COMPUTER INPUT" sent straight to you; the subscription rate is $13.00 a year.

THE OPINIONS AND VIEWS EXPRESSED IN "COMPUTER INPUT" ARE NOT NECESSARILY THOSE OF THE PUBLISHER.

ALL MATERIAL PUBLISHED IN "COMPUTER INPUT" BECOMES THE PROPERTY OF THE PUBLISHERS AND THEREFORE COPYRIGHT.

CONTENTS

NEWS
OVERSEAS INPUT 4
Tom returns with more facts and facets from overseas.

COVER COMPETITION 5
Enter our Computer Input Cover Competition and win a printer for your home computer!

ERIC'S ANSWER 6
More technical enquiries answered by "stuffed if I know" Eric.

HARDWARE REVIEW 7
This month we update most of the home computers now available in N.Z. A reference factfile!

Z80 MACHINE CODE - PART 3 11
Deep and deeper into the mystical world of 280 machine code-by Shayne Burlery.

PROGRAME OF THE MONTH 14
ARCHON for the C64 (also available for ATARI) This brilliant game, very loosely based on chess is our pick this month.

LABYRINTH 15
A great maze game for the SPECTRUM by Richard Haggart of Auckland.

CAT INPUT 18

VZ—200 USERS GROUP 19

BRAINTEASER CROSSWORD 21
This month we reprint last month's crossword with the full list of clues!

C64 SYNTH 1 22

SOFTWARE REVIEW 26
This month we review N.Z. grown Sega software

BITS & PIECES 27
Martin Beadle takes us into the realms of machine code for beginners - but this month as a pre-requisite to the following articles he takes us on a guided tour of binary and hescadecimal systems.

EXPLORING THE SEGA 31
The VISUAL DISPLAY PROCESSOR (VDP) is looked at in this continuing Sega Saga.

SOFTWARE INPUT 34
More than 6 pages of programs!

REWARDS 41

Buy Sell Swap 43

CLUBS 45

Subs Page 47
an extra page devoted solely to subscribers.

OUR COVER THIS MONTH IS "XADOM" BY QUICKSILVA
- SUPPLIED BY ALPINE COMPUTING LIMITED

OVERSEAS INPUT

Tom Cherrie

When Eric said to me "Tom, how about throwing some more light on what is happening on the home computer scene now that you're back in London," no problems I replied and promptly bent over forwards. After spending several months in Egypt where the closest you can get to a home computer is counting donkeys droppings on doorsteps its good to be back to some relative sanity.

To give you an idea of the current consumer popularity of home computers we have compiled the following chart. This reflects what is happening in major retail outlets throughout the country:

Machine	Price(£)	Distributor
1 Spectrum	99	Sinclair
2 CBM 64	199	CBM
3 BBC B	399	Acorn
4 Vic 20	140	CBM
5 Electron	199	Acorn
6 Memotech 500	250	MTX
7 Amstrad CPC464	239	Amstrad
8 Oric	99	Oric
9 Atari 800 XL	250	Atari
10 Dragon	150	Dragon

Interestingly enough although CBM have announced profits up by 57% to $33 million (US), accounted for by a raise in overall sales of 86% over previous years boosting the total sales figure up to $1.3 billion (US) it turns out that Sinclair has had proportionally a larger percentage of sales with the Spectrum as the best seller as the above chart backs up.

On the chart you may have noticed the name Amstrad. They are a company well known in the UK for producing a long line of cut price electrical goods. With the CPC 64 which incidentally has; a 64K memory available for basic, built in cassette deck, joystick & printer interfaces, an excellently set out key board and a basic that can be summed up as easy to us. Sold as a complete package the unit for its £239 cost includes a monchrome monitor or alternatively for £349 includes a colour monitor. At current market prices to set up a comparable system with a CBM 64 would cost approximately £ 450. The Amstrad CPC464 is certainly value for money and hopefully the poeple of NZ will see it soon.

An idea of the competition that is ever present in the UK market place can be shown by the Atari 600XL and the CGL (SORD) M5 computers.

The 600XL launched barely a year ago to replace the ageing 400 & 800 micro's is presently being sold for £100 in many major retailers, a reduction of £50 for the original asking price. The same situation occurs with the CGL M5 and its current market price of £49.95, a reduction of over £100.

In the UK research has shown that generally people when buying computers have no idea what they are buying and more often than not buy purely on heresay or word of mouth. First time buyers it has been found, find it more helpful to go to a home computer shop for advice and thus make their purchase. People in business, Managing Directors etc, also find it helpful to visit Home Computer Shops before making a Business Computer purchase. Generally what is done is they purchase a Home Computer and examine its capabilities and limitations in the business scene so as to get a more educated insight into what is necessary for their particular needs. I certainly hope we NZ'ers are a bit more switched on

Why Teachers Like Computers

The success of the VIC 20 and Commodore 64 is not simply a matter of salesmanship and price but a combination of software availability and adaptability, after-sales service, continuity of supply, reliability and simplicity.

Software has to be specific to the current curiculum and this is the responsibility and objective of these involved in the promotion of Commodore in education.

Teachers need software that enables them to write instructional aids for particular lessons and allows students to write their own programs to consolidate learning:

A summary of what educationalists consider to be the uses to which computers could be put includes:

- A tool of developing general thinking and problem-solving skills (computer assisted instruction).
- A tool for teaching (computer based instruction.
- An essential for preparing students to live in a world dependent on technology and information.
- A stimulus for consideration of the impact and implication of computerisation on society.
- To teach computer science.
- An administrative tool for calculation of records, word processing collecting, maintaining and utilising information.
- A motivator as part of the learning process.
- A tool to record and diagnose results.
- A remedial aid for specific learning problems.
- A teacher with infinite patience.

*WIN A PRINTER FOR YOUR HOME COMPUTER!!

COMPUTER INPUT COVER COMPETITION

Entries close 15th November 1984

All you have to do is design the cover for the December 84 Computer Input cover.

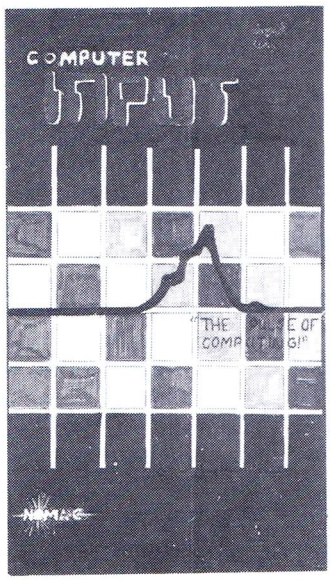
It must be A4 size (297mm x 210mm).

The lettering "Computer Input" & "NZ's No 1 Home Computing magazine" must appear somewhere on the sheet.

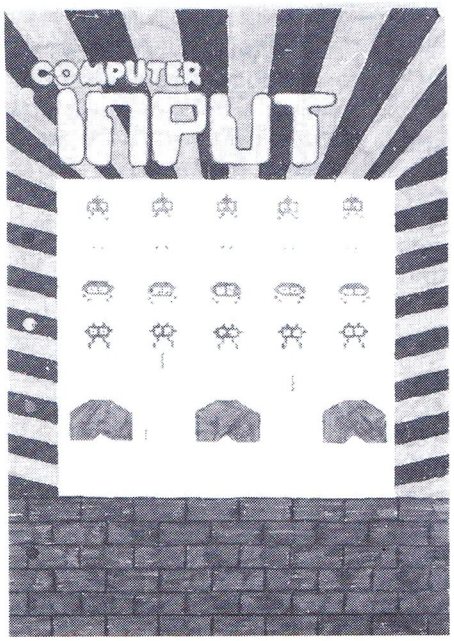
So get those ideas into us before the closing date and add print-out capability to your computer.

Here are a few of the entries we have received so far:

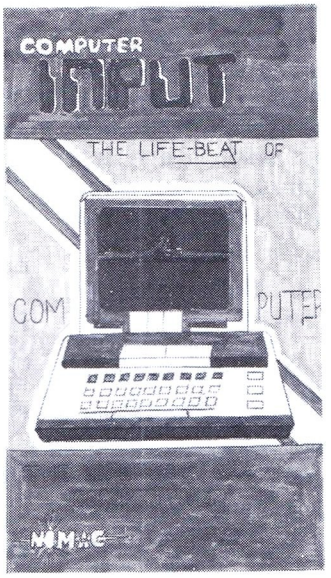
CRAIG TICKELPENNY- TE AWAMUTU



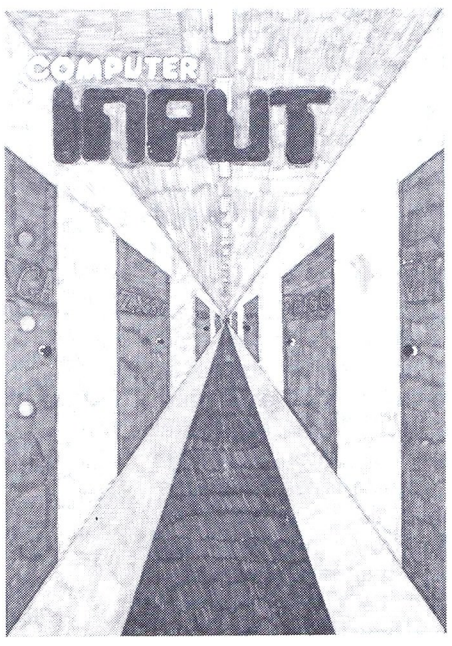
DAVID GILBERT — RANGIORA



GREG TICKELPENNY - TE AWAMUTU

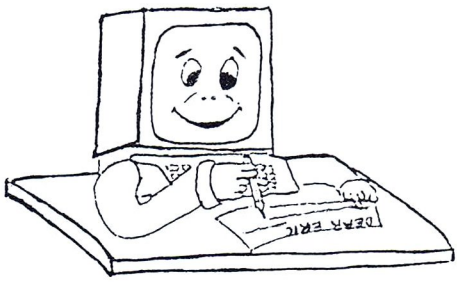


MATTHEW DWYER — DUNEDIN



* We have changed the prize (from that started previously) because most of our readers have got a computer anyway!

Eric's Answers



Dear Sir,
I am making 3D machine code games for my ZX-SPECTRUM, so I was wondering (and hoping) if you by any chance have a machine code routine for scrolling sideways on the spectrum, please!!!

Kent Ferguson.

Perhaps there may be a reader out there that can send an answer into us to help Kent.

Dear Ed,

I have a 16k Spectrum and I would like to know if any of your readers in the Howick, Pakuranga area have one as I would like to swap some software with them. I also have a problem, could you please tell me if there is any way in which I can check how much Memory I have left when I'm in the middle of typing in a program?.

Robert Hooker

P. Hopkins

To find memory used on ZX81 peek the system variable E-LINE subtract 16509 and divide by 1024.

ED.

Dear Sir,

I have found an error in the 'AUTO RUN' program listed on page 16, in Sega Input, of the May/June issue. It skips programs instead of touching them. To make it run your readers could add this line:

45 POLE &H82A2, O

This sets the program found flag to O, a 'found' value.

Miles Tooney

Dear Eric,

First up, let me compliment you and your staff on a great mag, however it could be greatly improved (as well as getting a wider readership) by including a column for pocket computers and calculators as used in serious applications maths, electronics etc as these can't be beaten for fieldwork where a TV and 240 V are not available. As most of your program listings are games (nothing wrong with that!!) one would have to conclude that your mag is aimed at the ex-fun parlour crowd!! What a waste of kiwi talent, expertise etc. Games come and go (Rubiks cube for example) and Game magazines are two-a penny. If you doubt that go down to your local book stockist sometimes. I'm sure serious users and game players can co-exsist in one magazine, there may even be an overlap at times!!! Your comments please.

L Burne

ED.

EX-FUN PARLOUR CROWD! how dare you! No, seriously, Computer Imput is New Zealands Home computing magazine — whatever that involves at any one time. Games, yes, but I'm sure you'll find a wealth of serious information between our covers to. As you say, games are good, but don't let that fool you, home computing is a serious thing. It has already surpassed other types of computing in many other countries, its just a matter of time before N.Z. realises that. (except for our readers who already know it!).

Yes, we would like to support all facets of home computing (ie pocket computers and calculators). Again, send in your own material, and let's get the ball rolling.

Dear Eric,

I have an expanded VIC 20 and I was wondering if it is possible to use 'user defined graphics' with a 16k.

I have tried myself to acheive this, but have always met with failure. Perhaps you or an astute reader could volunteer a programme which accommodates this.

Yours to enlightened.

Craig Webster

ED.

See "Programmable Characters for the VIC 20" — Computer Input July page 31 by M. Vickers.

Dear Eric,

Congradulations on your great magazine! I always look foward to reading it.

I have two things to ask of you:

1. Can you tell me whien the first edition of "Program Input" will be published.
2. Could you please reveiw the "Sega SC-3000."

Looking foward to your reply!.

ED

1. PROGRAM INPUT is available now (actually published in June) at only $1 a copy — send your order to COMPUTER INPUT
   P.O. BOX 39-278
   AUCKLAND WEST
2. We have reviewed the Sega SC 3000 in our November issue.

Dear Eric,

I have a Vic-20 with 16k ram. I have consideberably long loading games on my computer and wondering if I could transfer these games to cartridge instead of waiting ages for them to load from cassette. Can I?.

Also how about starting up a 'Vic Input' or a 'Commodore Input'? I know many poeple who own Commodore computers and would be very pleased if you did so.

Also after seeing Wayne Jefferys letter I think you should start an 'Adventure Input' or something to help adventurists like myself. Last of all John Osbornes trick doesn't always work on my Vic-20 with or without my 16k ram.

Tim Davey

ED.

Yes you can transfer any program to cartridge, but, the cost & hassle involved in doing it makes it impractical. It would be cheaper and better in the long run to buy a disk drive.

Yes, we would love to have a regular Vic and 64 input, and will do in the future however out magazine is your magazine so send your own material in and get the balling rolling.

Adventure Input — ditto!

Eric

hardware review

This month's Hardware Review is a round up of some of the more recent Home Computers on the market at present (obviously we couldn't review every computer).
Reviewed are:

Commodore 64, ORIC, ZX81, Spectrum, Apple IIe, BBCB, VIC 20, Sega SC3000, JR100, Spectravideo 318, 328, Atari 600XL, Atari 800XL, Acorn Electron, VZ200, Cat, Colour genie, Sharp MZ700.

Commodore 64

CPU	6510
ROM	20K
RAM	64K
SCREEN	40 CHRSx25
COLOURS	16
SOFTWARE	VERY GOOD
PRICE	$995.00 (approx)

ORIC

CPU	6502
ROM	16K
RAM	16K, 48K
SCREEN	40 CHRSx28
COLOURS	8
SOFTWARE	COULD BE BETTER
PRICE	$699.00 (approx)

ZX81

CPU	Z80
ROM	8K
RAM	1K
SCREEN	32 CHRSx24
COLOURS	NONE
SOFTWARE	VERY GOOD
PRICE	$150.00 (approx)

SPECTRUM

CPU	Z80
ROM	16K
RAM	16K, 48K
SCREEN	32 CHRSx24
COLOURS	8
SOFTWARE	VERY GOOD
PRICE	16K $399, 48K $599 (approx)

THE COMPUTER TERMINAL

257 Hinemoa St, Birkenhead Ph 419-0543

Retail: - Computers - Peripherals - Software - Books - Magazines

Chris France announces the opening on October 1st of a specialist computer store.

We will be representing

acorn electron

- Simply Superb machines with an unbeatable version of the basic programming language

commodore 64

- Great value for money, and an enormous range of Software

sinclair SPECTRUM

- Over a million units sold in the U.K., says it all!! Masses of Software

A full supporting range of printers, monitors, T.V. Sets, disc drives, Software, books, mags, etc, will be held for these machines.

Buying Your first Computer? Confused?

I will give you simple, honest and straight forward advice about this bewildering subject.

Upgrading your current system? Looking for Software?
Look over our range, and discuss your needs with us.

COME AND TALK TO CHRIS FRANCE

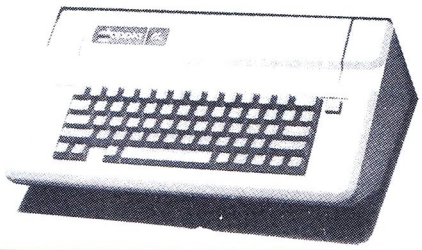
9 am - 6 pm weekdays 9 am - 3 pm Saturdays

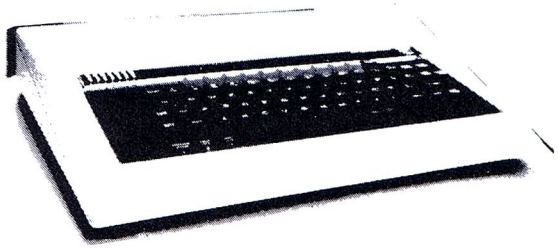
WE ACCEPT CASH - VISA OR BANKCARD -OR PROVIDE TERMS

THE COMPUTER TERMINAL

APPLE IIe

CPU	6502
ROM	16K
RAM	48K
SCREEN	40 CHRSx24
COLOURS	15
SOFTWARE	VERY GOOD
PRICE	$4,857.00 (starter pack)



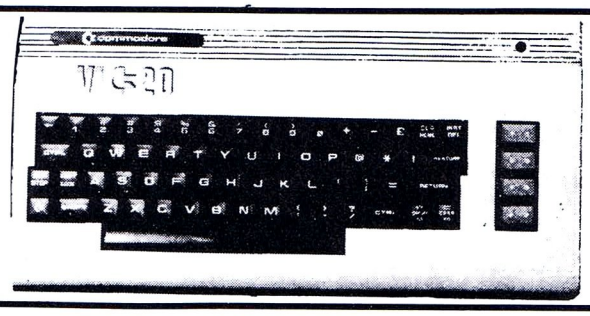


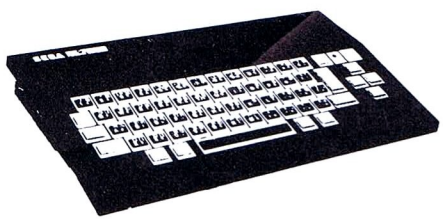
BBC.B.

CPU	6502
ROM	32K
RAM	32K
SCREEN	80 CHRSx30
COLOURS	16
SOFTWARE	VERY GOOD
PRICE	$1699.00 (approx)

VIC 20

CPU	6502
ROM	16K
RAM	3.5K
SCREEN	22 CHRSx32
COLOURS	16
SOFTWARE	VERY GOOD
PRICE	$430.00 (approx)



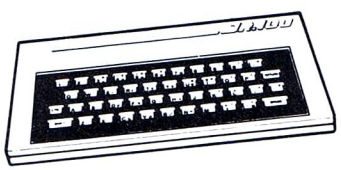


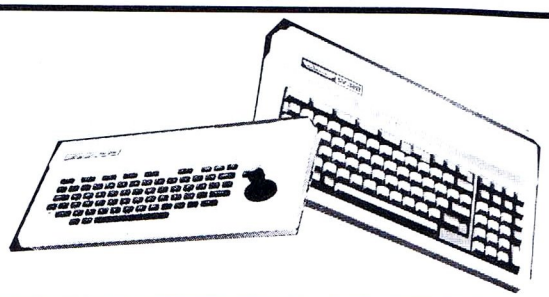
SEGA SC3000

CPU	Z80A
ROM	8K
RAM	16K, 32K
SCREEN	38 CHRSx24
COLOURS	16
SOFTWARE	GOOD
PRICE	$399.00 (approx)

J.R.100

CPU	MN 1800
ROM	8K
RAM	16K
SCREEN	32 CHRSx24
COLOURS	NONE
SOFTWARE	COULD BE BETTER
PRICE	250.00 (approx)





SPECTRAVIDEO 318, 328

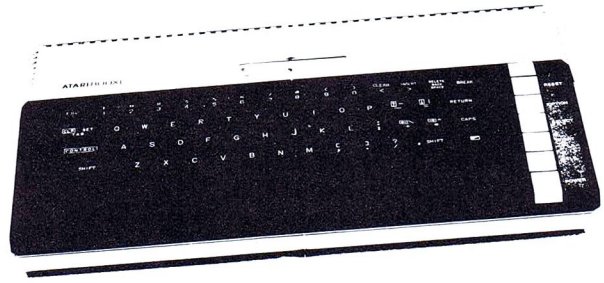
CPU	Z80A
ROM	32K
RAM	32K, 80K
SCREEN	80 Column
COLOURS	16
SOFTWARE	GOOD
PRICE	318, $695. 328, $995. (approx)

ATARI 600XL

CPU	6502
ROM	24K
RAM	16K
SCREEN	40 CHRSx24
COLOURS	256
SOFTWARE	COULD BE BETTER
PRICE	$595.00 (approx)

ATARI 800XL

CPU	6502
ROM	32K
RAM	64K
SCREEN	40 CHRSx24
COLOURS	256
SOFTWARE	GOOD
PRICE	$895.00 (approx)



ACORN ELECTRON

CPU	6502
ROM	32K
RAM	32K
SCREEN	40 CHRSx25
COLOURS	8
SOFTWARE	COULD BE BETTER
PRICE	$795.00 (approx)

VZ 200

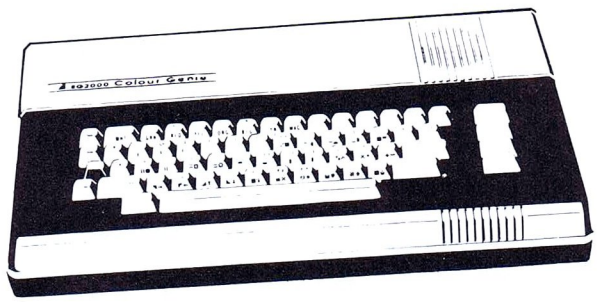
CPU	Z80A
ROM	16K
RAM	8K
SCREEN	32 CHRSx16
COLOURS	6
SOFTWARE	COULD BE BETTER
PRICE	$299.00 (approx)

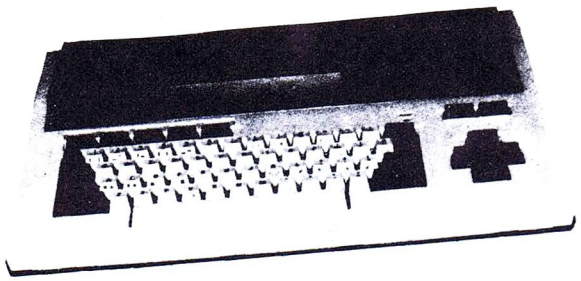
CAT.

CPU	6502
ROM	32K
RAM	64K
SCREEN	40, 80 CHRSx24
COLOURS	8
SOFTWARE	GOOD
PRICE	$1195.00 (approx)

COLOUR GENIE

CPU	Z80A
ROM	16K
RAM	32K
SCREEN	40 CHRSx24
COLOURS	8
SOFTWARE	COULD BE BETTER
PRICE	$495.00 (approx)





SHARP MZ700

CPU	Z80A
ROM	6K
RAM	64K
SCREEN	40 CHRSx25
COLOURS	8
SOFTWARE	COULD BE BETTER
PRICE	$995.00 (approx)

Z80 MACHINE CODE

PART 3

By S. Burbery

ABSOLUTE JUMPS

In BASIC when a routine is to be repeated more than once you don't write the routine many times, you GOTO the start of the routine for the number of times required. In machine code there is a command similar to GOTO, it is JP NN. What this does is to make the machine code program continue from address NN.

EXAMPLE

ADDRESS	Z80 ASSEMBLER	CODE
1000	1d A, 5	625
1002	JP NN	195 NN

Where NN is the address to jump to. This is worked out using the method described in part 1. If N + 256* N = 1000 then the program would go on and on forever always loading A with 5. So what we need are commands that operate if the last result calculated was equal to 0 and not equal to 0 these are JPZ NN and JPNZ NN.

EXAMPLE:

```
1d A, 1
DEC A
JPZ NN
```

Since A would = 0 the jump would be done.

JPNZ NN - Jump to NN if the last result calculated was not 0.

EXAMPLE:

```
1d A, 5
1D B, 4
SUB A, B
JPZ NN
```

The jump would not take place as the last result ie A-B would not equal 0.
So now we have the following jumping comands.

BASIC	Z80 AASEMBLER	CODE
GO TO NN	JP NN	195 NN
IF RESULT = 0 THEN NN	JPZ NN	202 NN
IF RESULT ()0 THEN NN	JPNZ NN	199 NN

RELATIVE JUMPS

These are small jumps fowards and backwards. They jump N bytes foward and 256-N bytes backwards using JR.

EXAMPLE:

```
JR 3 —— N
BYTE 0
BYTE 1
BYTE 2
BYTE 3
```

This would jump over bytes 0, 1 and 2 from N and land on byte 3. So for relative jumps foward start counting the number of jumps foward from the second byte after N.

For backward relative jumps it is more complex.

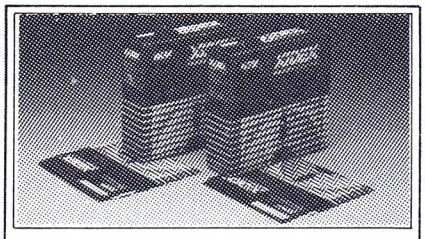
EXAMPLE:

```
BYTE 1
BYTE 0
JR 252 —— N
```

For backwards jumps count from N and subtract the number of jumps from 256 ie 256-4 jumps (including the number itself) = 252.

The test for 0 and not 0 can also be used for relative jumps.

Perfect Peripherals
to expand your system
from Dick Smith Electronics



Xidex Quality Diskettes

The new Xidex range of precision disks offer a level of quality and reliability previously unknown. Better disk substrate, finer particles in the coating, ultra-smooth polishing, tighter tolerances and an extra 18 critical tests ensure that all disks easily exceed the ANS 1 specs for 96 TPI high density recording.

Single sided, double density soft sector
Cat X-3510 ..... $6.50 each
Box of 10 Single Sided, d/density soft sector
Cat X-3512 ..... $65.00
Box of 10 Double Sided, d/density soft sector
Cat X-3514 ..... $85.00 box

Keep your drives clean and error free!

Disk Head Cleaning Kit

One area often overlooked is your disk drives. For longer life and absolute reliability, they should be cleaned at least once a week. These handy items make head cleaning easy.
Cat X-3517

$24.95

Replacement Disk Insert
Cat X-3518 ..... $6.95

Store your Disks in this quality

Diskette Library

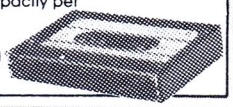
Even at our low prices, you should still treat your disks with care – especially if your company's financial records are on them! This disk library holds and protects up to 10 diskettes in their jackets, in an upright position for easy use. Can be closed for storage. A cheap investment.
Cat X-3515

$9.95

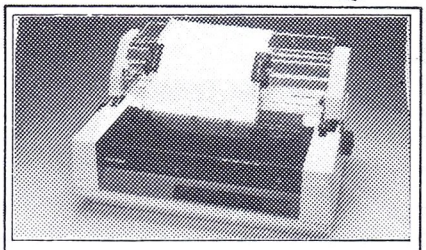
Keep it on Cassette!

Data Cassette Tape

Yes we're now stocking the famous 'Microcassette' computer verified cassette tape. Five minutes per side gives over 40K capacity per side.
Cat. X-3502



$4.50



Budget Daisywheel Printer

If you're using your computer for word processing, this daisywheel printer will give you top quality printing at a budget price. Prints at 18 cps. Offers a choice of 3 pitches (10/12/15 cpi) plus proportional. Takes standard 96-character print wheels and ribbon cartridges (Diablo/Qume compatible), paper up to 330mm wide. Very quiet too: only 58dBA. Standard Centronics-type interface suits most popular computers.
Cat X-3270

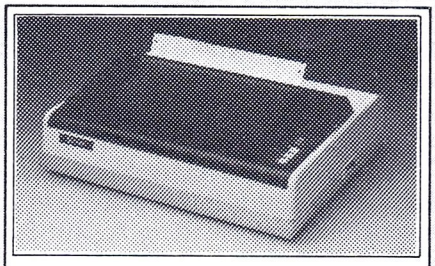
$1135

Ribbon cartridge for X-3270 Printer
Cat X-3271 ..... $19.95
Tractor feed attachment as shown above
Cat X-3273 ..... $195.00

High Resolution Amber Monitor

Amber non-glare screen that is especially suited to extended viewing.
20MHz bandwidth delivers exceptionally high resolution display in 80 column and high resolution graphics mode.
Cat X-1225

$549.95

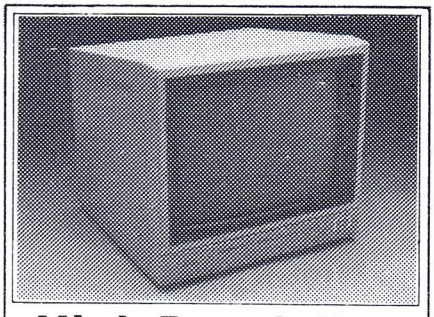


BX-80 Dot Matrix Printer

The BX-80 offers high quality, speedy dot-matrix printing at a price far lower than comparable printers. Bi-directional, prints the full upper and lower case (with true descenders) ASCII, character set at 80 cps, with four character widths: 80 columns, 254mm wide either single sheet (friction feed) or fan-fold (sprocket feed). Prints bit-image graphics (640 dots/line), responds to ESC code sequences for software control. Standard Centronics type interface suits most popular computers.
Cat X-3268

$795.00

Ribbon cartridge for X-3268 printer
Cat X-3269 ..... $19.95



High Resolution Green Monitor

Even with a colour computer, you may prefer to use a green screen monitor instead of a colour monitor – especially if you're using it for business. This high-resolution green monitor has a 30cm screen and 18 MHz band width, giving a bright, sharp display, even on 80-column text and hi- res graphics!
Cat X-1220

$449.95

DICK SMITH ELECTRONICS PTY LTD

Newmarket	98 Carlton Gore Rd. Tel 504 409
Papatoetoe	26 East Tamaki Rd. Tel 278 2355
	(Open till 8.30pm Thursday nights)
Avondale	1795 Great North Rd. Tel 886 696
Hamilton	450 Anglesea St. Tel 394 490
Christchurch	Cnr Victoria St & Bealey Ave. Tel 50405 NOW OPEN

Business Hours:
Mon – Fri 9.00am – 5.30pm
Sat Morn 9.00am – 12noon

VISA

Mail Orders
Dick Smith Electronics
Private Bag, Newmarket.
Speedy Mail Order Service
Just phone Auckland 504 409, ask for mail orders, quote your Bankcard or Visa Card number and your order will receive prompt attention.
(Collect calls NOT accepted)

P & P Charges

ORDER VALUE	CHARGE
$ 5.00 – $ 9.00	$1.00
$ 10.00 – $24.99	$2.00
$ 25.00 – $49.99	$3.00
$ 50.00 – $99.99	$4.00
$100.00 or more	$5.50

These charges are for goods sent by post in New Zealand only – NOT airmail, overseas or road freight

Finance available to approved customers through AGC

NZ113/LL

Z80 ASSEMBLER	CODE
JR N	24N
JRZ N	40N
JRNZ N	32N

Checking 2 Bytes variables for 0

METHOD:

Z80 ASSEMBLER	CODE
1d A, H	124
or L	181

If both H and L were 0 the test for 0 would true. I won't explain the use of "or" all that matters is that it works.

The same could be done for BC and DE.

Z80 ASSEMBLER	CODE
OR B	176
or C	177
or D	178
or E	179
or H	180
or L	181

SOLUTION TO THE PROBLEM

Z80 ASSEMBLER	CODE
1d HI NN	33 NN
1dBC NN	1 NN
1d(HI) N	54N
INCHI	35
DECBC	11
1d A, B	120
or C	177
JRNZ 248	32 248
RET	201

1dHI NN HI = start of the display file.
1dBC NN BC = number of characters to be printed.
1d(HI) N print character whose code is N.
INCHI HI points to the next print position

DECBC BC = BC - 1
1d A, B
or C

JRNZ 248 if Bc > 0 then go around again.
RET - return to BASIC.
ZX81 owners will have to make the following alterations:

1) Use 1d HL (12 64) to find the start of the display file.
2) Make the program avoid the newline characters if you don't do this the program will crash.

You now have the commands to write many machine code programs. In my next article I will explain more commands which are not necessary but are very useful.

SATELITE SOFTWARE LTD.

P.O. Box 7259, WELLESLEY ST, AUCKLAND

N.Z.'s NEWEST software distribution company.
We are dedicated to bringing low priced N.Z. Produced Software and peripherals to the N.Z. public.
We're on the lookout for N.Z. programmers.
If you are interested in getting your Software distributed in N.Z. while making money into the bargain, then contact us -
We'll do the rest.

THE FORBIDDEN ZONE
for the Sega SC3000

PART ONE:
STRANDED IN SPACE

This is an armchair adventure. You suddenly find yourself transported to a damaged spaceship somewhere in another galaxy. In order to complete the adventure, you must give commands to your faithful obedient robot(!). These commands are single words, a sample of which can be obtained from typing 'h' when the game starts. All commands are entered in lowercase. Part one takes you towards the city of Doom.

PART TWO:
THE CITY OF DOOM

This is a continuation of part 1. You must enter the city of Doom by finding the secret passage way. Having entered the city, you must find and obtain valuable fuel for your damaged spacecraft. Once this has been achieved, you must make your way out of the city undetected.

PARTS THREE AND FOUR WILL BE AVAILABLE FOR RELEASE SHORTLY.

Each adventure contains high resolution color graphics. Commands are single words such as GET, INVENTORY, KILL, LOOK, HELP and are typed in lowercase. All adventures will run on either LVIIIA/B machine, and are supplied on a high quality C10 cassette.

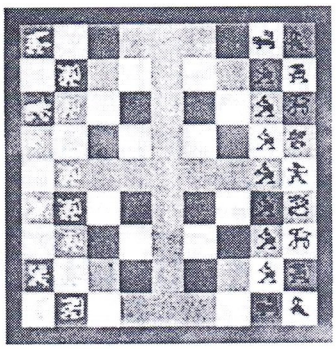
Each part available on cassette for only $16.95 (Inc Postage and packaging)

We accept Bankcard & Visa.

PROGRAM OF THE MONTH

ARCHON

by ELECTRONIC ARTS **C.64**

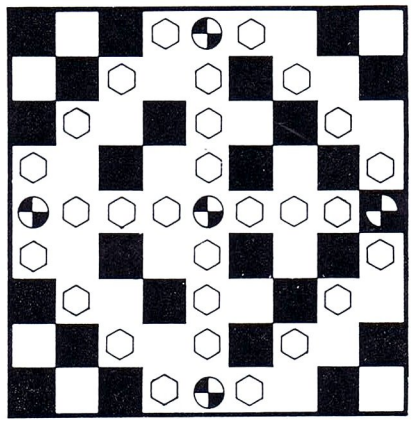


Archon

Archon depicts the etternal struggle between light and darkness as a contest of action and strategy between opposing forces.

The light side and the dark side are equal in number and balanced in strength, but not identical. There aim is eliminate the opposite side or occupy the 5 "power points".

Archon is played on two different Screens. On one, the strategy screen, you and your opponent take turns as in a game of chess manouvering your pieces into favourable positions. When you place your "Icon" on to a square already occupied by your opponents Icon the game shifts temporarily to the "combat arena screen". The disputed square expands to fill the entire screen and the two Icons controlled by each opponents joystics have to fight for that square.

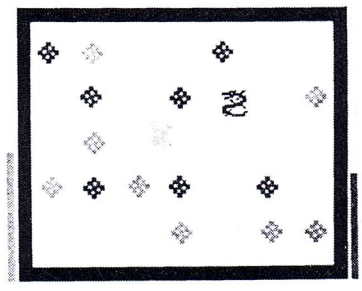


Each Icon is a little bit different than another except the Knights and the Goblins these are similar to pawns in chess there are: On the light side, a wizard 2 valkries 2 golems 2 unicorns a pheonix and DJINNI on the dark side a sorceress 2 banshee 2 trolls 2 Basilisk a dragon and a shapeshifter. The wizard and the sorceress both have magic spells. (1) They can teleport other pieces to different squares. (2)Heal any Icon of all wounds. (3) Shift the flow of time (Achons strategy screen changes. While some squares are always white or always black ethers vary from black through different colours to white in a continuous cycle. Your fortunes in the game tend to be relative with the cycle because the light side is stronger on light squares and the dark side stronger on dark squares. (4) Exchange any two pieces. (5) Summon elemental which can attack any opposition but vanishes after the battle win or lose. (6) Revive any Icon previously killed in combat. (7) Imprision any opposition e.g. if a white Icon is imprisioned he cannot move off his square until the squares turn white.

In the combat arena each Icon has different fighting skills. The Knights and Goblins fight on foot with sword and club other Icons can fire fireballs, arrows, etc, and can fly or walk.

Archon is one of the better games we have received to date. You can either play against the computer (which is very hard to beat) or against a friend.

Visual ★★★★
Sound ★★★★
Program ★★★★
difficulty ★★★★
overall ★★★★★



THE COMBAT ARENA

Our Ratings are:

- **VISUAL:** Based on the use of graphics, colour, special effects, and special features.
- **SOUND:** Based on skillful sound effects, musical variation, and complexity of the notes used.
- **PROGRAM:** How well written, and how well it exploits computer capabilities.
- **DIFFICULTY:** Levels of skill required, degree of interest, and time to complete the game or each stage.
- **OVERALL:** We review programs of a wide price range, rating each on value for money, interest, and overall presentation.

*	**Hopeless**
**	**Sub-Standard**
***	**What we would expect**
****	**Very Good**
*****	**Exceptional**

LABYRINTH

SPECTRUM

Richard Haggart
Bayswater
Auckland.

This is a great 3 dimensional maze game.

The object of the game is the find your way out of the maze.

If while trying to find your way out and you are completely lost then you can get some help by pressing the 'H' key. Once you have pressed the key the screen will clear and you will be shown a plan of the maze. This will also indicate your possition in the maze. However, the plan will only remain on veiw for a short period of time and you are only given access to the plan 5 times.

Once the game starts you will be given a three dimensional representation of the maze as you would see it. This veiw is governed by the direction in which you are looking. You can look lighter North, South, East or West. When you move you move one place forward in the direction you are looking. The keys for looking in different directions are:

West	South	North	East
5	6	7	8

As indicated by the arrows above the keys. Press 'O' to move one place forward in the direction you are looking. Press 'H' for Help.

```
  10 CLEAR : GO SUB 8000
  20 RESTORE 9000: GO SUB 9000
  30 PRINT AT 21,0; FLASH 1;"
     PRESS ANY KEY              "
  40 IF INKEY$="" THEN GO TO 40
  50 BRIGHT 0
  60 FOR N=9 TO 21: PRINT AT N,0
;,,: NEXT N
  70 PRINT AT 10,1;"PRESS "Y" FO
R INSTRUCTIONS"
  80 IF INKEY$="" THEN GO TO 80
  90 IF INKEY$="Y" OR INKEY$="y"
 THEN GO SUB 8200
 100 LET B$="8": LET D=1: LET M=
0
 110 LET P=0: LET X=9: LET Y=1
 120 LET X1=X: LET Y1=Y
 140 BORDER 7: PAPER 7: CLS : IN
K 0
 150 GO TO 500
 220 IF A$="5" THEN LET B$=A$: L
ET D=-1: BEEP .2,10: GO TO 500
 230 IF A$="8" THEN LET B$=A$: L
ET D=1: BEEP .2,10: GO TO 500
 240 IF A$="6" THEN LET B$=A$: L
ET D=1: BEEP .2,10: GO TO 500
 250 IF A$="7" THEN LET B$=A$: L
ET D=-1: BEEP .2,10: GO TO 500
 260 LET A$=INKEY$: IF A$="" THE
N GO TO 260
 270 BEEP .2,10: IF A$="H" OR A$
="h" THEN LET P=P+1: IF P<=5 THE
N BEEP .2,10: GO SUB 1000: GO TO
 500
 280 IF A$="0" THEN GO TO 300
 290 GO TO 220
 300 IF B$="8" THEN LET Y1=Y1+1
 310 IF B$="5" THEN LET Y1=Y1-1
 320 IF B$="6" THEN LET X1=X1+1
 330 IF B$="7" THEN LET X1=X1-1
 400 BEEP .2,10: CLS
 410 IF Y1=0 AND X1<>15 THEN LET
 Y1=1: PRINT AT 2,3;"YOU ARE TRY
ING TO LEAVE BY";AT 4,3;"GOING T
HROUGH THE ENTRANCE";AT 6,11;"TR
Y AGAIN": FOR N=0 TO 250: NEXT N
: GO TO 500
 420 IF X1=15 AND Y1=1 THEN LET
M=M+1: GO TO 3000
 430 IF A(X1,Y1)=1 THEN PRINT AT
 10,2;"YOU CANNOT GO THROUGH WAL
LS.";AT 12,12;"TRY AGAIN": FOR N
=0 TO 200: NEXT N: LET X1=X: LET
 Y1=Y: GO TO 500
 440 LET M=M+1
 500 CLS : PRINT AT 1,6;"YOU ARE
 LOOKING ";D$((VAL B$)-4)
 510 PLOT 8,0: DRAW 0,175: PLOT
247,0: DRAW 0,175
 520 IF B$="8" OR B$="5" THEN GO
 TO 800
 530 LET X=X1: LET Y=Y1
 540 LET D1=D: FOR I=1 TO 5
 550 IF A(X+D,Y)=1 THEN GO SUB (
I*10)+2000: LET D=D1: GO TO 260
 560 IF A(X+D,Y-1)=1 THEN GO SUB
 (I*10)+2060: GO TO 560
 570 GO SUB (I*10)+2210
 580 IF A(X+D,Y+1)=1 THEN GO SUB
 (I*10)+2110: GO TO 600
 590 GO SUB (I*10)+2160
 610 LET D=D+D1: NEXT I
 620 LET D=D1: GO TO 260
 800 LET X=X1: LET Y=Y1
 810 LET D1=D: FOR I=1 TO 5
 815 IF Y+D=0 AND X<>15 THEN GO
TO (I*10)+2490
 817 IF Y+D=0 OR Y+D=32 THEN IF
X=15 THEN GO TO (I*10)+2590
 820 IF A(X,Y+D)=1 THEN GO SUB (
I*10)+2000: LET D=D1: GO TO 260
 830 IF A(X,Y+D)=1 THEN GO SUB (
I*10)+2060: GO TO 850
 840 GO SUB (I*10)+2210
 850 IF A(X+1,Y+D)=1 THEN GO SUB
 (I*10)+2110: GO TO 870
 860 GO SUB (I*10)+2160
 880 LET D=D+D1: NEXT I
 890 LET d=d1: GO TO 260
1000 BORDER 7: PAPER 7: CLS : IN
K 0
1010 PRINT AT 0,8;"PLAN OF MAZE
No.";p
1020 FOR n=1 TO 20: FOR b=1 TO 3
1
1030 IF a(n,b)=1 THEN PRINT AT n
,b;"■"
1040 NEXT b: NEXT n
1050 IF x=9 AND y=1 THEN PRINT A
T 9,0;">"
1060 PRINT AT x,y; FLASH 1;"X"
1070 IF x<>9 OR y<>1 THEN PRINT
AT 9,1;">"
1080 PRINT AT 15,1;"<"
1100 PRINT '''' INK 1;"     YOU A
RE WHERE THE "X" IS."
1110 PRINT ;"  ENTRANCE = >
 EXIT = <"
1130 FOR N=0 TO 50
1140 BEEP .05,N: BEEP .05,50-N
1150 NEXT N
1160 CLS : RETURN
2010 DRAW -239,0: PLOT 8,0: DRAW
 239,0: RETURN
2020 PLOT 48,32: DRAW 159,0: PLO
T 48,144: DRAW 159,0: RETURN
2030 PLOT 80,56: DRAW 95,0: PLOT
 80,120: DRAW 95,0: RETURN
2040 PLOT 104,72: DRAW 47,0: PLO
T 104,104: DRAW 47,0: RETURN
2050 PLOT 120,80: DRAW 15,0: PLO
T 120,96: DRAW 15,0: RETURN
2060 RETURN
2070 PLOT 8,0: DRAW 40,32: DRAW
0,111: DRAW -40,32: RETURN
2080 PLOT 48,32: DRAW 32,24: DRA
W 0,64: DRAW -32,24: RETURN
2090 PLOT 80,56: DRAW 24,16: DRA
W 0,32: DRAW -24,16: RETURN
```

SHARP

MZ 700 SERIES
HOME COLOURS COMPUTERS

*64 K MEMORY

*PLUGS INTO YOUR T.V.

*BUILT IN CASSETTE

*READY TO RUN PROGRAMS AVAILABLE

NEW ZEALAND TYPEWRITERS LTD.

1 BYRON AVE.
TAKAPUNA
PH. 494104

MICRO SOFTWARE HIRE CLUB

C-64, VIC 20, SPECTRUM, ZX81, BBC, ATARI.

OPEN 6 days per week.

15A Porana Road, Takapuna. (Box 33-196 AUCKLAND)

Ph. 4448063.

SEGA computer programs

SEGA® SC-3000

10 Basic programs for a SEGA SC3000
fitted with LEVEL IIIB cartridge,
only $15.00 (includes p&p)
Send cheque or money order to:

HI-TECH PROGRAMMING
P.O. BOX 1438
WELLINGTON

```
2100 PLOT 104,72: DRAW 16,8: DRA
W 0,16: DRAW -16,8: RETURN
2110 PLOT 120,80: DRAW 8,8: DRAW
 -8,8: RETURN
2120 PLOT 247,175: DRAW -40,-32:
 DRAW 0,-111: DRAW 40,-32: RETUR
N
2130 PLOT 207,32: DRAW -32,24: D
RAW 0,64: DRAW 32,24: RETURN
2140 PLOT 175,56: DRAW -24,16: D
RAW 0,32: DRAW 24,16: RETURN
2150 PLOT 151,72: DRAW -16,8: DR
AW 0,16: DRAW 16,8: RETURN
2160 PLOT 135,80: DRAW -8,8: DRA
W 8,8: RETURN
2170 PLOT 247,32: DRAW -40,0: DR
AW 0,112: DRAW 40,0: RETURN
2180 PLOT 207,56: DRAW -32,0: DR
AW 0,64: DRAW 32,0: RETURN
2190 PLOT 175,72: DRAW -24,0: DR
AW 0,32: DRAW 24,0: RETURN
2200 PLOT 151,80: DRAW -16,0: DR
AW 0,16: DRAW 16,0: RETURN
2210 PLOT 127,88: DRAW 8,0: RETU
RN
2220 PLOT 8,32: DRAW 40,0: DRAW
0,112: DRAW -40,0: RETURN
2230 PLOT 48,56: DRAW 32,0: DRAW
 0,64: DRAW -32,0: RETURN
2240 PLOT 80,72: DRAW 24,0: DRAW
 0,32: DRAW -24,0: RETURN
2250 PLOT 104,80: DRAW 16,0: DRA
W 0,16: DRAW -16,0: RETURN
2260 PLOT 127,88: DRAW -7,0: RET
URN
2500 PLOT 8,160: DRAW 239,0: PLO
T 8,151: DRAW 239,0: PRINT AT 2,
8;"E N T R A N C E": LET D=D1: G
O TO 260
2510 PLOT 48,136: DRAW 159,0: PL
OT 48,127: DRAW 159,0: PRINT AT
5,12;"ENTRANCE": LET D=D1: GO TO
 260
2550 LET D=D1: GO TO 260
2610 PLOT 48,136: DRAW 159,0: PL
OT 48,127: DRAW 159,0: PRINT AT
5,14;"EXIT": LET D=D1: GO TO 260
2700 GO TO 260
3000 BORDER 1: PAPER 1: CLS : IN
K 7: BRIGHT 1
3010 PRINT AT 21,0; FLASH 1;" ▌
▚▀▜▄▛▀▙▗▟▀▜▄▛▀▙ ":
RANDOMIZE USR 3280
3020 PRINT AT 21,0; FLASH 1;" ▌
▀▌ ▐▄▛▀▙▐▀▌ ▐▀▀ ":
RANDOMIZE USR 3280
3030 PRINT AT 21,0; FLASH 1;" ▀
▜▌▐▌ ▐▄▛ ▐▀▌ ▐▌▐ ":
RANDOMIZE USR 3280
3035 PRINT AT 21,0; FLASH 1;"
"
3040 FOR N=1 TO 16
3050 RANDOMIZE USR 3280
3060 NEXT N
3070 BRIGHT 1
3080 PRINT AT 8,3;"YIU MANAGED T
O GET OUT IN"
3090 PRINT AT 9,3;M;" MOVES"
3100 IF P=0 THEN PRINT AT 11,0;"
YOU DID NOT ASK FOR HELP AT ALL"
;
3110 IF P=1 THEN PRINT AT 11,3;"
YOU ASKED FOR HELP ONCE."
3120 IF P=2 THEN PRINT AT 11,3;"
YOU ASKED FOR HELP TWICE"
3130 IF P>2 THEN PRINT AT 11,2;"
YOU ASKED FOR HELP ";P;" TIMES"
3140 PRINT AT 15,0;"WOULD YOU LI
KE TO SEE THE MAZE  YOU HAVE CON
QUERED AGAIN ?"
3150 PRINT AT 18,8;"PRESS "Y" IF
 YES"
3160 IF INKEY$="" THEN GO TO 316
0
3170 IF INKEY$="Y" OR INKEY$="y"
 THEN GO SUB 4000
3180 FOR N=15 TO 18: PRINT AT N,
0;,,: NEXT N
3190 PRINT AT 15,0;"WOULD YOU LI
KE TO PLAY AGAIN ?"
3200 IF INKEY$="Y" OR INKEY$="y"
 THEN GO SUB 4000
3210 IF INKEY$="" THEN GO TO 312
0
3220 IF INKEY$="Y" OR INKEY$="y"
 THEN GO TO 3240
3230 BRIGHT 0: BORDER 7: PAPER 7
: CLS : INK 0
3240 GO TO 10
4000 BRIGHT 0: BORDER 7: PAPER 7
: CLS : INK 0
4005 PRINT AT 0,10;"PLAN OF MAZE
"
4010 FOR N=1 TO 20
4020 FOR I=1 TO 31
4030 IF A(N,I)=1 THEN PRINT AT N
,I;"■"
4040 NEXT I: NEXT N
4050 PRINT INK 0;"    PRESS ANY
KEY TO RETURN "
4060 IF INKEY$="" THEN GO TO 406
0
4070 CLS : RETURN
8000 BORDER 1: PAPER 1: CLS : IN
K 7: BRIGHT 1
8005 PRINT AT 21,0; FLASH 1;"
                              ":
RANDOMIZE USR 3280
8010 PRINT AT 21,0; FLASH 1;" ▌
▚▀▜▄▛▀▙▗▟▀▜▄▛▀▙ ":
RANDOMIZE USR 3280
8020 PRINT AT 21,0; FLASH 1;" ▌
▀▌ ▐▄▛▀▙▐▀▌ ▐▀▀ ":
RANDOMIZE USR 3280
8030 PRINT AT 21,0; FLASH 1;" ▀
▜▌▐▌ ▐▄▛ ▐▀▌ ▐▌▐ ":
RANDOMIZE USR 3280
8035 PRINT AT 21,0; FLASH 1;"
"
8040 FOR N=0 TO 16
8050 RANDOMIZE USR 3280
8060 NEXT N
8070 PRINT AT 9,8;"BY RICHARD HA
GGART"
8080 PRINT AT 12,2;"PLEASE WAIT
WHILE I WORK OUT"
8090 PRINT AT 14,12;"THE MAZE"
8100 RETURN
8210 PRINT AT 10,1;"
                              "
8220 PRINT AT 6,2;"THE OBJECT OF
 THE GAME IS TO","FIND YOUR WAY
OUT OF THE MAZE"
8230 PRINT "    IF WHILE TRYING TO
 FIND YOUR  WAY OUT OF THE MAZE
YOU FIND YOUARE COMPLETELY LOST
THEN YOU CANGET SOME HELP BY PRE
SSING "H".  ONCE YOU HAVE PRESSE
D THE KEY   THE SCREEN WILL CLEA
R AND YOU   WILL BE SHOWN A PLAN
 OF THE     MAZE.THIS WILL INDIC
ATE YOUR    POSITION IN THE MAZE
, THE EXIT  AND THE ENTRANCE.HOW
EVER THE    PLAN WILL ONLY REMAI
N ON VIEW   FOR A SHORT PERIOD O
F TIME."
8240 PRINT AT 21,0;"    PRESS ANY
 KEY TO CONTINUE"
8250 IF INKEY$="" THEN GO TO 825
0
8260 BEEP .2,0: BEEP .2,10
8270 FOR N=6 TO 21: PRINT AT N,0
;,,: NEXT N
8275 PRINT AT 6,0;"  ANOTHER THI
NG ABOUT THE PLAN    OF THE MAZE
 IS THAT YOU ARE ONLYGIVEN ACCES
S TO IT FIVE TIMES"
8280 PRINT "  ONCE THE GAME STAR
TS YOU WILL BE GIVEN A THREE DIM
ENSIONAL    REPRESENTATION OF TH
E MAZE AS   YOU WOULD SEE IT.THI
S VIEW IS   GOVERNED BY THE DIRE
CTION IN    WHICH YOU ARE LOOKIN
G.YOU CAN   LOOK EITHER NORTH,SO
UTH,EAST OR WEST."
8290 PRINT "  WHEN YOU MOVE YOU
MOVE ONE    PLACE FORWARD IN THE
 DIRECTION  YOU ARE LOOKING."
8300 PRINT AT 21,0;"    PRESS ANY
 KEY TO CONTINUE    "
8310 IF INKEY$="" THEN GO TO 831
0
8320 BEEP .0,0: BEEP .2,10
8330 FOR N=6 TO 21: PRINT AT N,0
;,,: NEXT N
8340 PRINT AT 6,0;"KEYS FOR LOOK
ING IN DIFFERENT   DIRECTIONS:"
8350 PRINT '" WEST     SOUTH     N
ORTH     EAST"
8360 PRINT "  5         6         7
         8"
8370 PRINT '"AS INDICATED BY THE
 ARROWS ABOVETHE KEY."
8375 PRINT '"PRESS "0"TO MOVE ON
E PLACE     FORWARD IN THE DIRE
CTION YOU   ARE LOOKING."
8380 PRINT '"         PRESS "H" FO
R HELP"
8390 PRINT AT 21,0;"     PRESS A
NY KEY TO PLAY"
8400 IF INKEY$="" THEN GO TO 840
0
8410 BEEP .2,0: BEEP .2,10
8420 BORDER 7: PAPER 7: CLS : IN
K 0
8430 RETURN
9000 DIM A(20,31): DIM D$(4,5)
9010 FOR N=1 TO 20
9020 READ B$
9030 FOR I=1 TO 31
```

```
9040 LET A(N,I)=VAL B$(I)
9070 NEXT I
9080 NEXT N: BEEP .2,0
9090 BEEP .2,10
9095 FOR N=1 TO 4: READ D$(N): N
EXT N: RETURN
9100 DATA "1111111111111111111111
1111111111"
9110 DATA "1010010000101000000000
0100100001"
9120 DATA "1000110101010111101111
0010001101"
9130 DATA "1010010111010101010000
1010100001"
9140 DATA "1011111010001010001010
1010111111"
9150 DATA "1000000000111011111010
1000100001"
9160 DATA "1010101110000000000000
1010101101"
9170 DATA "1010101000011010101010
1010000011"
9180 DATA "0010101010100101010101
1010111001"
9190 DATA "1011110000000110101011
1010101111"
9200 DATA "1010101111110010100010
0010000001"
9210 DATA "1110001010111100011011
1110101101"
9220 DATA "1000111010101111100010
0000101001"
9230 DATA "1111100000000101001111
1111101011"
9240 DATA "0010111010111010100000
0001001001"
9250 DATA "1010000010000010101011
0101111011"
9260 DATA "1010111111101111110001
0100000001"
9270 DATA "1000010000010000001111
0111011101"
9280 DATA "1010100101000011100000
0001000001"
9290 DATA "1111111111111111111111
1111111111"
9300 DATA "WEST","SOUTH","NORTH"
,"EAST"
```

CAT Input

Unfortunately, the listing for the "80 cent" Project from last month was left out. If you haven't already written your own software, here is a simple Program to graph light intensity.

```
10  HGR 5
20  HCOLOR= 4
30  FOR X = 0 TO 279
40 Y =  PDL (0)
50  IF Y >  = 191 THEN Y = 191
60  HPLOT X,Y
70  NEXT X
80  GOTO 10
```

PFS:FILE is a very easy-to-use information management system for the CAT or Apple Computer.

Basically, PFS:FILE works like a paper filing system, without the paper. But unlike a conventional filing system, FILE lets you record, file, retrieve and, most important, use your information in ways that are just not possible with paper and a filing cabinet.

The form and it's function.

With FILE, you organize your information in "forms" you create yourself right on the computer screen.

Once you've designed the basic form—with spaces for all the necessary data—all you do is fill in the blanks.

What's more, if you find you'd like to change your original form design, FILE lets you change just the form, without having to re-enter the information on it.

Getting at the information you need

FILE lets you retrieve the specific information you're looking for in a variety of ways so you get just the information you want and nothing else.

For example, you can get all the information that is 'less than', 'more than', 'equal to', 'between', 'not', or any combination you choose.

Once you've made your choice, FILE will display, one by one, all the forms that contain information matching the criteria you specified.

As each form appears, you can update it if necessary by typing in new information, or print it with a few simple key-strokes. FILE even lets you sort and print selected items such as names and addresses for a mailing list.

PFS:FILE is available from Dick Smith Electronics
Cat. No X7610 $239.95

Rectangles and Squares

Rectangles and Squares can easily be displayed by using the **DRAW SQUARE** command. The variables which must be defined are the co-ordinates of the first and third corners. To DRAW a hollow yellow square at the top left of the screen and with sides of length 20, you would need to run Program 1.

On line 40 the co-ordinate 0,0 sets the location of the first corner and 20,20 is the co-ordinate of the 3rd corner of the square.

The **PAINT** command allows a closed area on the screen to be filled with one of eight colours. The starting point, boundary colour and PAINTING colour must be defined. If you add line 50 to program 1 you will see the effect of the paint command.

```
10  REM  PROGRAM 1
20  HGR 5
30  HCOLOR= 4
40  DRAW HSQUARE(0,0 TO 20,20)


50  PAINT (10,10),5,4
```

Software Review - "Reach for the Stars"

Available from Dick Smith Electronics. Cat. No X7700 $59.95

"Reach for the Stars" is a fast-paced, exciting challenge for up to four players. If fewer players are available the computer can provide a graduated variety of opponents. At your choice, each computer operated Empire will compete at beginner, experienced or veteran level.

Initially, your empire consists only of a single partially developed planet. By exploring neighbouring star-systems you discover which planets are most suitable for colonization. Planetary characteristics include population size, industrial capacity and social environment in addition to a basic classification determining it's suitability for human settlement.

Colonization must be carefully planned as those planets with the greatest industrial capacity often come with a hostile environment. Only a considerable resource investment will make such planets more habitable.

As industrial development proceeds throughout the four expanding Empires, it becomes inevitable that contact is made. Those players who have balanced their economic growth with both a proper regard for planetary defense and the acquistion of an adequate starship fleet will be in the best position to exploit these initial contacts.

Now comes the planning of full-scale military operations. A large starship fleet is the prime requisite for a successful campaign. However, occupation forces must be assembled for planetary invasions if heavily populated enemy systems are to be quickly overcome.

The scope of operations provided by the sophisticated, yet simply structured game mechanics is immense. Fast, machine language programming ensures no lost time as the computer instantly responds to every instruction. A set-piece scenario is provided with a constant galaxy of 54 star systems, the planetary components of which vary from game to game. Length of play is variable and can be saved at any point.

In addition a menu of interesting options may be added at the players' request. These include alien intervention, plague and natural disaster, variable galaxy configuration (with the facility to name your own systems on colonization) and automatic production for those players who wish to concern themselves with purely military matters.

Victory is assessed in two ways. Firstly, points are awarded each turn for increases in population, industrial expansion, occupation of enemy planets and starship battle victories. Secondly, each player is required to select one of these victory criteria as his prime aim with the consequence that he or she will receive a premium on the points awarded for achieving that condition.

Such decisions are kept secret from other players and, as you will readily appreciate, exert a profound influence on your long-term strategy.

VZ200 Input

If you are using programs with DATA lines, why not use the VZ200 capability by a subroutine that will use new data to create revised data lines, as follows:

```
100 DATA 56
110 INPUT A
120 READ B
130 C=A+B
140 PRINT C
150 PRINT "100 DATA";C
```

Now CSAVE and the next time the program is used (once you have moved the cursor up to the last printed line and entered) the new data will be in the program.

With a FOR/NEXT loop, the theory can be applied to extensive programs. For example, you can use it to update top scores in games programs, or to update a budget program.

Gordon Woolf.

From Paul Vowles comes this program to produce amazing pictures of 3D pyramids on your VZ200. Without doubt, this is one of the best programs we've seen so far for the VZ200 Colour Computer!

```
10 REMARKABLE PYRAMIDS
15 REM BY PAUL VOWLES
20 CLS:INPUT "PYRAMID HEIGHT";H
22 INPUT "LENGTH OF BASE";B
25 D=B/2
30 IF B<1 OR B>63 OR H<0 OR H>60 THEN 20
40 CLS:MODE(1):COLOR 6,1:REM CYAN
50 DL=(63-B)+(B/2.5)
55 DU=60-H:DM=63-B
57 DX=60-INT(H/2.5)
60 Y1=DU:X1=DL:Y2=60:X2=63+D:GOSUB 1000
65 DX=60-INT(H/2.5)
70 Y1=60:X1=DM:GOSUB  1000
80 Y1=DX:Y2=DX:GOSUB 1000
90 FOR Z=Y1 TO 60: SET(X1,Z)
95 SET (X2,Z):NEXT Z
100 X2=DL:Y1=60:Y2=DU:GOSUB 1000
110 Y1=DX:GOSUB 1000
120 X1=63+D:GOSUB 1000
130 COLOR 7,1
140 DN=63+B/2:DK=(63+B/2)-(B/2.5)
150 X2=DK:X1=DN:GOSUB 1000
160 X1=63-B:GOSUB 1000
170 Y1=60:GOSUB 1000
180 X1=DN:GOSUB 1000
190 FOR Z=1 TO 5000:NEXT Z
200 INPUT "AGAIN";A$
210 IF LEFT$(A$,1)="Y" THEN 20
220 END
1000 S=1:IF X1>X2 AND Y1>Y2 THEN S=-1
1010 SET(X1,Y1):SET (X2,Y2)
1015 Y=Y1:N=1:IF Y1=Y2 THEN A1=0:GOTO 1030
1020 A1=(X2-X1)/(Y2-Y1):IF S=-1 THEN A1=-A1
1030 FOR X=X1 TO X2 STEP S
1035 IF X<0 THEN X=0
1040 IF Y<0 THEN Y=0
1050 SET(X,Y):N=N+1
1060 IF A1<>0 THEN Y=Y1+N/A1
1079 NEXT X:RETURN
```

In the mail came this letter from David Jones. He has found a number of functions which I'm sure other users will find interesting.

I've discovered with the sound command that it can use the following format:
SOUND 4,3:16,3:28,3:16,8:4,8 and so on... On the subject of arrays I have noticed that they are not restricted to three dimensions as suggested in the manual... Also, although the book doesn't mention it, one can use integer variables such as A%, B% and C% etc. This speeds up processing since the system doesn't have to handle floating point maths for that particular problem...
I have been experimenting with the system to try to determine it's memory map. I found the range of addresses between hex 6800 and hex 6FFF are not fully decoded and all address the same functions. They address the visual display generator, the tape in and out ports, and the sound generator. POKEing dec 1 or 32 to any of these locations will cause a sound to be made (POKE 1 then 0 then 1 then 0 etc to cause tone, and vary the gap betweens POKEs to change the pitch). POKEing 8 or decimal 16 to these locations will cause the screen to change modes and background colours. POKEing 4 then 0 then 4 then 0 etc will cause an output on the tape out line, and PEEKing these locations will show that the decimal 64 bit changes when a tape is played in. As yet, I haven't discovered what the last two bits are for, but I suspect that they cause a foreground colour change.

VZ200 Expansion Board

Construction Details:

The eight input and eight output decoders used in this project were wire-wrapped on a piece of 100x120mm wire wrap board. A board this size enables some of the other expansion projects to be built on it.
Commence construction by drilling a small hole in each corner of the board for the four spacers. Position a 16 pin 1C socket in the top left hand corner of the board and glue it in position. Leaving a 5mm gap place the 14 pin 1C socket parallel to the 16 pin socket. The last two sockets should be positioned as shown in fig. 1.
Socket A is for the 1C plug which connects to the VZ200's printer port. Connect 16 pieces of 200mm hookup wire to each of the pins of the 16 way 1C plug. Next month we'll give the printer port connections and details on the 1C pin connections.

Parts list:
(1) 100x120mm wire-wrap board
(1) 14 pin wire-wrap 1C socket
(3) 16 pin wire-wrap 1C sockets
(4) 30mm spacers
(1) 16 pin 1C plug

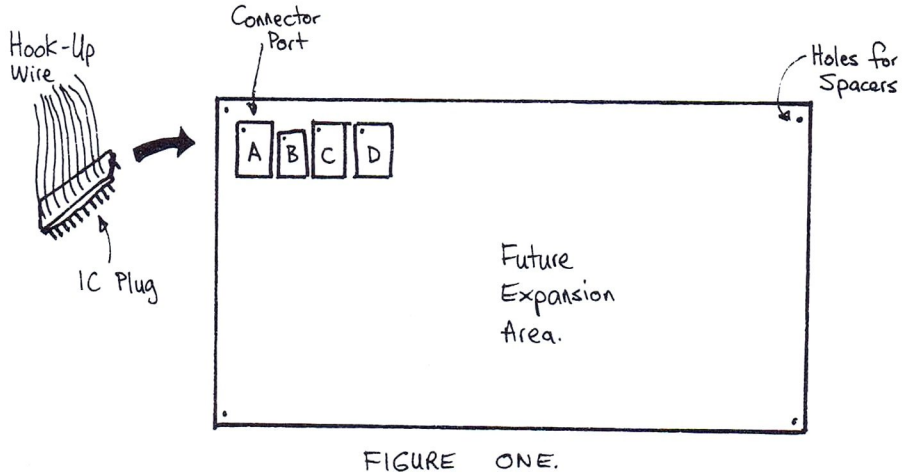


FIGURE ONE.

BRAIN TEASER CROSSWORD

The closing date for this crossword is **OCTOBER 30th** so theres plenty of time to get those entries in.

The winner will receive a "Computer Input" package which includes:

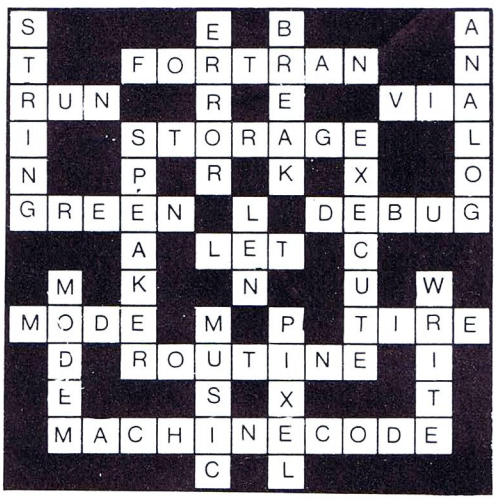
1) Software program of your choice to the value of $40 (must be available in NZ.)
2) Free "Program Input" magazine
3) Computer Input Tee Shirt

So lets see those entries!

DOWN.

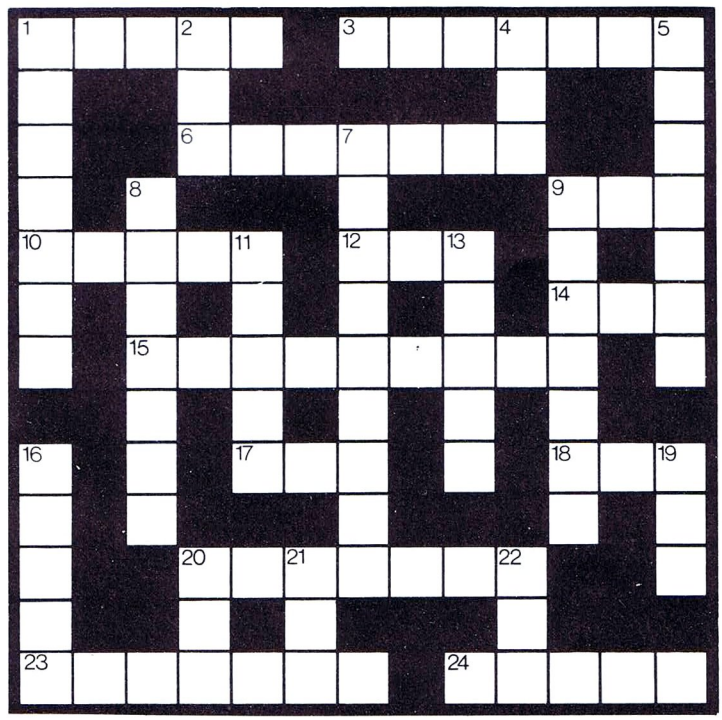
1. To Return to previous stage of cyclic process (7)
2. Too MANY of these could slow the opperating speed of your programs (3)
4. An abreviation of "binary digit" (3)
5. The computer displays information requested once an ..... has been typed in (7)
7. Locating errors in Software (9)
8. Close group of similar things (7)
9. The unit of a computer used for all manual communication with the computer (7)
11. Computer Input is a ..... publication (5)
13. Device which physically transports some recording medium (5)
16. The science dealing with the formal principles of reasoning (5)
19. MID$ (16 Down,3) + LEFT$ (5 Down,1) + RIGHT$ (21 Down,1) (3)
20. A detailed plan (3)
21. To place a desired value into a storage location (3)
22. Finnish (3)

JULY SOLUTION:



BRAINTEASER CROSSWORD WINNERS

April '84- Martin Beadle, New Lynn
May/June- Dimetrios Stylianon, New Lynn.



ACROSS

1. The difference between the upper and lower limits of a function or quantity (5)
3. Meaningless data present in any storage device (7)
6. The result of multiplying two factors (7)
9. The nerve centre of any digital computer system (3)
10. Used in programming to enable us to put more than one command on one line (5)
12. An operation in Boolean algebra also known as the logical product (3)
14. A logic dement operating with binary digits (3)
15. The study of the relationship between symbols and their meaning (9)
17. MID$ (8 Down,1) + MID$ (8 Down,2) + MID$ (8 Down,4) (3)
18. A mathematical function (3)
20. Any combination of characters and symbols designed to communicate information (7)
23. The process of electronic computing (7)
24. A device performing the function of addition using digital signals (5)

C64 SYNTH 1

D. Lynch
Wellsford.

This program lets you assign 'sounds' to selected keys on the computer or load values from tape.

The fuction keys are used as F.1. Assign keys values, F.2. Purge all values, F.3. Print assigned value of key F.4. Goto instructions, F.5. Save keyboard values, F.6. Transfer key values, F.7. Load keyboard values, F.8. End Program.

If you use F.1. you can assign "Attack Decay", "Sustain release", "Waveform" etc. You should have a knowledge of how sounds are created on the C 64. Read the section of the manual if youare a novice.

You then press the keys to hear the sounds. You can play tunes, or list values for use in other programs sound effects.

Tips

When keying in the program, leave REM statements in unitl you have it running smoothly.

Watch out for line 1059 as this resets the computer and wipes the program.

```
1 :
2 REM ******INTRODUCTION******                    *************************
3 :
5 POKE 53280,5:POKE 53281,2
6 PRINT"■"
10 DIMTM(200),WV(200),AD(200),SR(200),HF(200),LF(200),HI(200),LO(200)
11 DIMHP(200),LP(200),BP(200)
15 IF LL=1 THEN PRINT"□■■■■■■■■ALL VALUES ARE PURGED":FORI=1TO2000:NEXT:GOTO 1000
20 PRINT"□":PRINT:PRINT
30 PRINTTAB(16)"■          ■"
40 PRINTTAB(16)"■ SYNTH-1 ■"
50 PRINTTAB(16)"■          ■"
60 PRINT:PRINT:PRINT"          'I' FOR INSTRUCTIONS"
70 PRINT:PRINT"          ANYTHING ELSE TO START"
80 GET A$:IFA$=""THEN80
90 IFA$<>"I"THEN1000
100 :
101 REM ******INSTRUCTIONS******                   *************************
102 :
110 PRINT"□";TAB(13)"■ INSTRUCTIONS ■":PRINT
120 PRINT"WITH THIS PROGRAM, YOU CAN USE THE KEY-
130 PRINT"BOARD TO COMPOSE YOUR OWN SOUND EFFECTS
140 PRINT"WITH THE COMPUTER.
150 PRINT"TO START WITH, YOU MUST EITHER ASSIGN
160 PRINT"VALUES TO THE KEYS OR LOAD VALUES FROM
170 PRINT"TAPE.  TO LOAD VALUES FROM TAPE, DON'T
180 PRINT"ASSIGN KEY VALUES WHEN YOU START.  WHEN
190 PRINT"IN THE USER PART OF THE PROGRAM, THE
200 PRINT"FUNCTION KEYS CAN BE USED AS FOLLOWS:
210 PRINT:PRINT"<F1> ASSIGN KEY VALUES
220 PRINT"<F3> PRINT ASSIGNED VALUE OF A KEY
230 PRINT"<F5> SAVE KEYBOARD VALUES
240 PRINT"<F7> LOAD KEYBOARD VALUES
245 PRINT"<F2> PURGE ALL VALUES"
246 PRINT"<F4> GOTO INSTRUCTIONS
247 PRINT"<F6> TRANSFER KEY VALUES
248 PRINT"<F8> END PROGRAM
249 GETA$:IFA$=""THEN 249
250 PRINT"□IF YOU CHOOSE <F1> THEN YOU CAN ASSIGN
260 PRINT"ATTACK/DECAY; SUSTAIN/RELEASE; WAVEFORM
270 PRINT"ETC TO A KEY.  SEE MANUAL FOR MORE
280 PRINT"DETAILS.":PRINT:PRINT
290 PRINT"THE KEYS YOU CAN USE ARE:":PRINT
300 PRINT"ABCDEFGHIJKLMNOPQRSTUVWXYZ1234567890!#$%&'()+-£↑*@=;:[]/?.,<>"
310 PRINT"AND THE QUOTE MARK.":PRINT
320 PRINT"WHEN USING THE FILTERS, TYPING A '0'
330 PRINT"WILL TURN THEM OFF.  ANY OTHER NUMBER
340 PRINT"WILL TURN THEM ON.":PRINT:PRINT
350 PRINT"PRESS ANY KEY TO START"
360 GET A$:IFA$=""THEN 360
1000 :
1001 REM ******MAKE SOUND******                    ************************
1002 :
1020 PRINT"□■■■■■■■■■■■■■■■DO YOU WANT TO ASSIGN VALUES (Y/N)
1030 GETA$:IFA$=""THEN 1030
1035 IF A$="Y" THEN 1500
```

```
1036 PRINT"■■ PRESS THE KEYS OR <F1> TO EXIT ■":PRINT
1040 GETKB$:IFKB$="" THEN 1040
1045 IFASC(KB$)<133ORASC(KB$)>139THEN1059
1050 ONASC(KB$)-132GOTO1500,1800,2000,2500,1056,100,3000
1054 GOTO 1059
1056 IFASC(KB$)=137 THEN CLR:LL=1:GOTO 10
1059 IFASC(KB$)=140THENPRINT"■"TAB(17);"■ END ■":SYS64738
1060 POKE 54296,15
1070 IFASC(KB$)<32ORASC(KB$)>95 THEN 1040
1080 POKE54277,AD(ASC(KB$))
1081 POKE54278,SR(ASC(KB$))
1082 POKE 54276,0
1083 POKE54276,WV(ASC(KB$))
1084 POKE54273,HF(ASC(KB$))
1085 POKE54272,LF(ASC(KB$))
1086 POKE54275,HI(ASC(KB$))
1087 POKE54274,LO(ASC(KB$))
1088 POKE54295,0
1089 IFHP(ASC(KB$))>0THENPOKE54296,79:POKE 54295,1
1090 IFLP(ASC(KB$))>0THENPOKE54296,31:POKE54295,1
1091 IFBP(ASC(KB$))>0THENPOKE54296,47:POKE54295,1
1092 POKE54293,0:POKE54294,0
1093 POKE54293,LB:POKE54294,HB
1095 PRINTKB$;
1100 FORI=0TOTM(ASC(KB$)):NEXT
1110 GOTO 1040
1500 :
1501 REM ******ASSIGN KEY VALUES******          **********************************
1502 :
1505 PRINT"■■■
```

This Year . . . don't buy your children a gift, buy them a future!

Your children are the most precious investment you can ever make. So it makes sense to give them the best possible start in life.

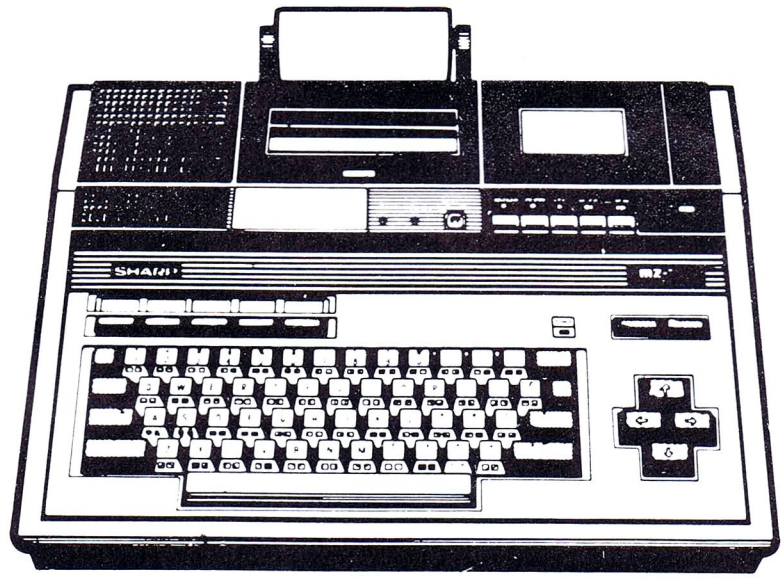
And in 1984 that means making sure they know how to handle a computer. Because only the computer literate will make it in the decades to come.

The new Sharp MZ721 Home Computer is the ideal Family Computer for you. Go along and see it, you'll be convinced, we are.

SHARP

MZ721 HOME COMPUTER

- Large 64K Bytes of Ram
- Full Size Keyboard
- Plugs into your TV
- Expandable
- 4 Colour Printer/ Plotter (Optional)



- Includes Built in Cassette Recorder
- Large Software Selection Available
- Program in Basic/ Pascal or machine Languages

Available from Authorised Sharp Stockists throughout NZ

NZ Distributers **Excelsior Supply Co Ltd**

☎ **Auckland** 660-618

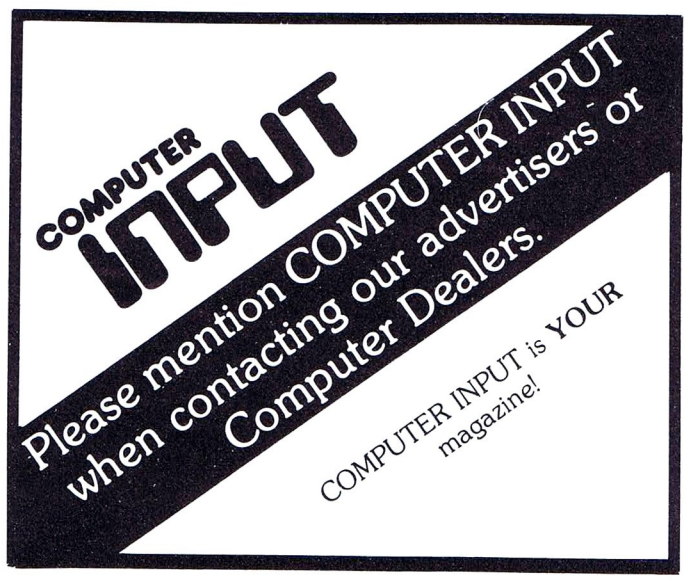
☎ **Wellington** 896-129

☎ **Christchurch** 890-687

CREATED FOR PERSONAL GROWTH

SHARP

```
1930 PRINT"LO PULSE (WVFM 65) ";TAB(20);LO(ASC(X$))
1940 PRINT"DURATION ";TAB(20);TM(ASC(X$))
1941 PRINT"HI PASS FILTER ";TAB(20);HP(ASC(X$))
1942 PRINT"LO PASS FILTER ";TAB(20);LP(ASC(X$))
1943 PRINT"BANDPASS FILTER ";TAB(20);BP(ASC(X$))
1944 PRINT"CUTOFF FREQ (HI) ";TAB(20);HB
1945 PRINT"CUTOFF FREQ (LO) ";TAB(20);LB
1950 PRINT:PRINT:PRINT"<RETURN> TO EXIT OR ANOTHER KEY"
1960 GET X$:IFX$="" THEN 1960
1970 IF ASC(X$)=13 THEN 1036
1980 IF ASC(X$)<32 OR ASC(X$)>95 THEN 1960
1990 GOTO 1825
2000 :
2001 REM *****SAVE KEY VALUES******                    ****************************
2002 :
2010 PRINT"■■■■■■■■■■■■■■■REWIND TAPE TO END OF ENTRY...
2020 PRINT"HIT ANY KEY OR <F1> TO EXIT"
2025 GET A$:IFA$=""THEN 2025
2026 IF ASC(A$)=133 THEN 1036
2030 OPEN 1,1,1
2040 FORI=32 TO 95:PRINT#1,TM(I):NEXT
2050 FORI=32 TO 95:PRINT#1,WV(I):NEXT
2060 FORI=32 TO 95:PRINT#1,AD(I):NEXT
2070 FORI=32 TO 95:PRINT#1,SR(I):NEXT
2080 FORI=32 TO 95:PRINT#1,HF(I):NEXT
2090 FORI=32 TO 95:PRINT#1,LF(I):NEXT
2100 FORI=32 TO 95:PRINT#1,HI(I):NEXT
2110 FORI=32 TO 95:PRINT#1,LO(I):NEXT
2120 CLOSE1
2130 GOTO 1036
2500 :
2501 REM ******LOAD KEY VALUES******                   ****************************
2502 :
2510 PRINT"■■■■■■■■■■■■■■■REWIND TAPE TO BEGINNING OF ENTRY...
2520 PRINT"HIT ANY KEY OR <F1> TO EXIT"
2525 GET A$:IFA$=""THEN 2525
2526 IF ASC(A$)=133 THEN 1036
2530 OPEN 1,1,0
2540 FORI=32 TO 95:INPUT#1,TM(I):NEXT
2550 FORI=32 TO 95:INPUT#1,WV(I):NEXT
2570 FORI=32 TO 95:INPUT#1,SR(I):NEXT
2580 FORI=32 TO 95:INPUT#1,HF(I):NEXT
2590 FORI=32 TO 95:INPUT#1,LF(I):NEXT
2600 FORI=32 TO 95:INPUT#1,HI(I):NEXT
2610 FORI=32 TO 95:INPUT#1,LO(I):NEXT
2620 CLOSE1
2630 GOTO 1036
3000 :
3001 REM******TRANSFER KEY VALUES******          ********************************
3010 PRINT"■■■■■■■■■■■■TYPE DONOR KEY... ";
3020 GET X$:IFX$=""THEN 3020
3025 IF ASC(X$)>95ORASC(X$)<32THEN3020
3026 PRINT X$
3030 PRINT"■■NOW RECIPIENT KEY... ";
3040 GET Y$:IFY$=""THEN 3040
3045 IF ASC(Y$)>95ORASC(X$)<32THEN3040
3046 PRINT Y$
3050 WV(ASC(Y$))=WV(ASC(X$))
3060 TM(ASC(Y$))=TM(ASC(X$))
3070 AD(ASC(Y$))=AD(ASC(X$))
3080 SR(ASC(Y$))=SR(ASC(X$))
3090 HF(ASC(Y$))=HF(ASC(X$))
3100 LF(ASC(Y$))=LF(ASC(X$))
3110 HI(ASC(Y$))=HI(ASC(X$))
3120 LO(ASC(Y$))=LO(ASC(X$))
3130 FORI=1TO1000:NEXT:GOTO1036
63995 :
63996 REM ******************************
63997 REM DAVID LYNCH, TOMARATA (TCS)
63998 REM ******************************
```

SOFTWARE REVIEW

In the Software Review section we review new games and utilities that become available for sale in New Zealand. However, there are hundreds, if not thousands, of exisitng software programs in use in New Zealand. What we want is for you, the reader, to review any software that you already have, for some of the "Golden Oldies" are still amongst the best.

We would like your views, for who would know better than the person who has paid out hard cash.

If possible, please use our format for reviews, with a brief description of the software and your overall conclusion.

We will publish the facts about any software or hardware that seem to be (by owners statements) at either end of the scale. So if you bought a game that turned out to be a complete waste of money or a program that kept you up all night (or even an average one), I'm sure the rest of New Zealand would like to know about it.

Our Ratings are:

- **VISUAL:** Based on the use of graphics, colour, special effects, and special features.
- **SOUND:** Based on skillful sound effects, musical variation, and complexity of the notes used.
- **PROGRAM:** How well written, and how well it exploits computer capabilities.
- **DIFFICULTY:** Levels of skill required, degree of interest, and time to complete the game or each stage.
- **OVERALL:** We review programs of a wide price range, rating each on value for money, interest, and overall presentation.

* **Hopeless**
** **Sub-Standard**
*** **What we would expect**
**** **Very Good**
***** **Exceptional**

Sega SC3000 ASTRO DEFENCE

As the Sole Survivor of the stricken Earth Battle Ship "universe", you must try and destroy the vicious Z arrog bleet before they destroy you. All you have left is your trusty "H-cannon".

This game makes full use of the Segas graphic capabilities and sound You use your joystic in port one to line up the enemy with your sights and fire button to shoot. You are sitting behind your starships screen battling off the never ending invasion force. When you fire, 4 laser beams home in on there target and if successful the invading ship is destroyed. There are 5 enemy ships attacking at one time and one of them every so often fires at you. Your battle ship "universe" has a force shield which can only withstand 20 hits but as the game progresses and the more enemy ships shot down your force field gains strength. If you are not successful in your mission your starship spectacularly disintegrates.

This game is one of the all familiar space invader type. The space ships come down from the top of the screen as you "shoot-em-up". Quite good though. The game is done in machine code and is very fast.

Visual ★★★★
Sound ★★★
Program ★★★★
difficulty ★★★★
overall ★★★★

Sega SC3000 The forbidden Zone Series

These are a series of 4 adventure type games each on a cassette of there own.

PART ONE:
STRANDED IN SPACE
This is an armchair adventure. You suddenly find yourself transported to a damaged spaceship somewhere in another galaxy. In order to complete the adventure, you must give commands to your faithful obedient robot(!). These commands are single words, a sample of which can be obtained from typing 'h' when the game starts. All commands are entered in lowercase. Part one takes you towards the city of Doom.

PART TWO:
THE CITY OF DOOM
This is a continuation of part 1. You must enter the city of Doom by finding the secret passage way. Having entered the city, you must find and obtain valuable fuel for your damaged spacecraft. Once this has been achieved, you must make your way out of the city undetected.

PART THREE:
BANDITS GALORE
The saga continues as you make your way back to your ship. Fighting off fiends,and the royal guards who now know about your plans to escape, you must safely transfer the fuel to your ship. When you cross the river of acid you will be ready to start the final race for survival.

PART FOUR:
THE FINAL CONFLICT
The final part of forbidden zone, you will be required to repair your ship, and escape the dreaded forces of the forbidden zone which have lain dormant, secretly watching your adventure. Now, they rise up in one last almighty effort to prevent your escape. Can you, using the wisdom of the fool, escape in one piece!

PARTS THREE AND FOUR WILL BE AVAILABLE FOR RELEASE SHORTLY.

Each adventure contains high resolution color graphics. Commands are single words such as GET, INVENTORY, KILL, LOOK, HELP and are typed in lowercase. All adventures will run on either LVIIIA/B machine, and are supplied on a high quality C10 cassette.

These games are very good if you like adventures. Each movement or action you make is supported by a graphics screen picture to give you a good idea of what is happening.

Visual ★★★★
Sound ★★★★
Program ★★★★
difficulty ★★★★
overall ★★★★

The City of Doom features a special loader which loads the adventure and automatically runs it. Other special features include,

STARWARS INTRODUCTION THEME
SUNRISE SUNSET INTERLUDE
SINGLE KEY ENTRY COMMANDS,

SPECIAL hint sheets are available for each adventure. These list common problems with solutions.

BITS & PIECES

NUMBER SYSTEMS

From time to time we read mentions of "Hexadeciaml" and "Binary" in articles in Computer Input. What do they mean? Well, lets' dig a little deeper into the beauty of numbers and at the same time find out what our history and mathematics teachers didn't tell us.

We can all count in decimal, can't we?. Perhaps you should just try, quietly, counting up to ten. O.K., hands up everyone who started "one, two, three ...". Go to the bottom of the class. That's the way we were taught, but a more correct count would be "zero, one, two ...". The concept of zero is very important in computer usage, and it might have helped the Roman Empire last a little longer. The Romans had no way of arithmetically espressing nothingness, and that together with the problems of even adding two numbers in the roman number system, made life very difficult for them.

DECIMAL

Let's pull our familiar decimal counting system apart and see how it works. Take a decimal number such as 428.75.

We know that this is four hundred and twenty eight point seven five. We start at the digit to the left of the point and say that this is the number of units, the next digit left is the number of tens, the next is the number of hundreds and so on. To put it another way, the 8 in the above example is the number of 10 raised to the power 0 ($10_0 = 1$). The 2 is the number of 10 raised to the power 1 ($10_1 = 10$) and the 4 is the number of 10 raised to the power 2 ($10^2 = 10 \times 10 = 100$). As we move left through the digits, we are "weighting" the number by increasing powers of ten. As we move right, the weighting decreases. To the right of the decimal point, the 7 is 7 times 10 raised to the -1 ($10_{-1} = 1/10_1 = 1$) and the 5 is 5 times 10 raised to the power -2 ($10^2 = 1/10^2 = 1/10 \times 10 = .01$).

The central concept is that a digit means different amounts of whatever you are counting depending upon its position with respect to the decimal point.

The numbers 3 and 33 both use the same digit, but imply very different quantities.

In the decimal system, the number we raise to a power -it's called the "BASE" - is 10. But 10 is not the only possibility. Any number can be used, but common sense says we should choose a base that offers a particular advantage for our application. There have been serious suggestions that for everyday use a duodecimal system -Base 12- would be better than a decimal system. Twelve is divisable by two, three, four and six and so would make arithmatic easier to handle. And if it has ever adopted, feet and inches and shillings and pence would make a big comeback! The base of a number system does not have to be an integer. In engineering and science, a base of 2.71828... is used in Napierian logarithms, which also crop up in Basic, usually as the function LOG (X).

BINARY

Deep down inside your computer the electronics take the form of switches. Now switches can be either on or off, and that suits the electronics because it's easy to detect an on or off, but a half-on is much more difficlut to detect. Since we have two possible states, let's give them symbols. Off we will assign the symbol "O" and to on we will assign a "1". So now, with a single switch we can represent the two numbers zero and one. What do we do if we want to represent the decimal number two?.

The answer is that we are forced to use a second switch. We turn switch two on and switch one off to represent decimal number two. The two switches are now symbolicly represented by "10". Don't confuse it with decimal ten, it is said as "one zero" and it equals decimal two.

We are building up a number system is which the units column has a weighting of one (it always does, no matter what the number system is), the "Power One" column has a weighting of two, and the next column, power two, will have a weighting of four. The base number which satisfies this is 2, so we have a number system based on powers of 2, and it's called the Binary System.

Let's convert decimal 428.75 to binary and see what it looks like. Do the integer part first, the part to the left of the decdimal point. Find the highest power of two that is less than the number. In this case, $2_8 = 256$ but $28_9 = 512$, so 2_8 is the one we want. Subtract this number, and then go through the process again until the subtraction gives zero.

SATELITE SOFTWARE LTD.

P.O. Box 7259,
WELLESLEY ST,
AUCKLAND

N.Z.'s NEWEST software distribution company.
We are dedicated to bringing low priced N.Z. Produced Software and peripherals to the N.Z. public.
We're on the lookout for N.Z. programmers.
If you are interested in getting your Software distributed in N.Z. while making money into the bargain, then contact us -
We'll do the rest.

THE FORBIDDEN ZONE
for the Sega SC3000

PART ONE:
STRANDED IN SPACE

This is an armchair adventure. You suddenly find yourself transported to a damaged spaceship somewhere in another galaxy. In order to complete the adventure, you must give commands to your faithful obedient robot(!). These commands are single words, a sample of which can be obtained from typing 'h' when the game starts. All commands are entered in lowercase. Part one takes you towards the city of Doom.

PART TWO:
THE CITY OF DOOM

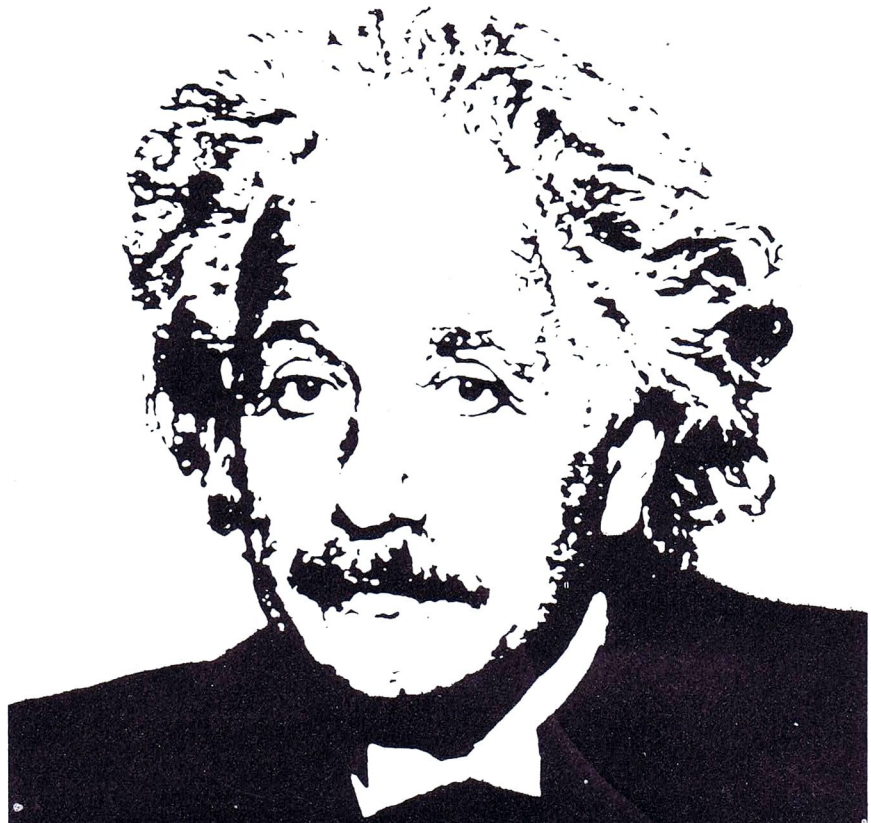
This is a continuation of part 1. You must enter the city of Doom by finding the secret passage way. Having entered the city, you must find and obtain valuable fuel for your damaged spacecraft. Once this has been achieved, you must make your way out of the city undetected.

PARTS THREE AND FOUR WILL BE AVAILABLE FOR RELEASE SHORTLY.

Each adventure contains high resolution color graphics. Commands are single words such as GET, INVENTORY, KILL, LOOK, HELP and are typed in lowercase. All adventures will run on either LVIIIA/B machine, and are supplied on a high quality C10 cassette.

Each part available on cassette for only $16.95 (Inc Postage and packaging)

We accept Bankcard & Visa.



Einstein's theories on choosing a micro computer

Choosing a micro is a daunting task for the new-comer and with an ever increasing number of micros emerging on the New Zealand market. Even up-grading, say, from a ZX81 can be a risky and expensive exercise with the wrong decisions made. At Einstein Scientific Ltd, we believe it is important to look at the real facts and specifications, and check exactly what you get for your money before choosing your micro computer system.

THE PIT-FALLS.

Don't buy a games machine.

Unless you want games and nothing else! With a games computer you are limited. Some computers, however, have the advantage of both games facility plus the whole world of computing to explore as your interest and skills develop. A real computer system will allow you to expand your knowledge of the high technology world, and help earn its keep with its added uses in the field of education, home, business use and communication.

Software.

Make sure the system you choose has a growing library of support software, to enable you to realise the full potential of your machine.

Check the quality of the product.

Low quality components and bad design will seriously affect the reliability of the end product, and lead to false economy. Watch out for unreliable edge connectors, corrosion and poor PCBs. Make sure that your supplier can provide an after sales service in case of product failure.

Don't let the add-ons add up.

A number of outlets are offering packages that seem to be good value at low cost. Unfortunately these offers have a hidden sting in as much as the essential accessories such as power supply, peripherals and software often carry a very high cost premium. Make sure you get an 'all-up' price to enable you to start operating the system. Software for low cost hardware usually costs between $50 and $100 for a ROM cartridge.

KEY POINTS TO LOOK FOR.

Computer language.

It is too difficult to programme a computer in its binary language so high level languages are used, the most popular being BASIC. However, there are a number of basics, some being very different from the rest. A de facto standard in the computer industry is Microsoft BASIC. Learn this and you will be able to programme in the majority of computer basics, such an important point if the home computer is to be used to educate your children to face the technology of the future.

Expansion.

As your interest and knowledge of computing grows you will need a computer system that will grow with you, able to accommodate printer, disk drive, joy-stick, communications modem and colour monitor as well as produce Hi-Fi sound effects.

Software.

The computer you choose should have a growing selection of utility software to make the most of its capabilities. Remember, computing is here to stay. You can't learn to compute on a toy or a device that does not behave like a real computer.

High resolution colour.

In general most home computers have a poor graphics resolution (or detail). Check on the vertical and horizontal resolution in graphic mode and multiply the two numbers together — if the result is less than 35,000, then the graphics can hardly be considered high resolution. Low resolution graphics displays, such as those used in games, tend to be "chunky" in appearance.

Keyboard.

For accurate entry of programmes and data into a computer it is important that the keyboard has a good tactile feel and operation. A standard computer keyboard layout will familiarise the user with the vast majority of computers which are used in the world of business and professional applications, very important if the purpose of purchasing the computer is educational.

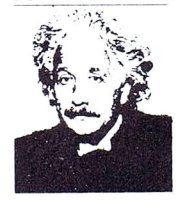
RAM (Random Access Memory).

One of the most important features of a computer is the amount of RAM, or memory included. In general, the more powerful and exacting a computer program, the more RAM it requires. But take care, all computers are advertised quoting the total RAM used in the system. Computers use up a great deal of their own RAM for storing essential data, in particular supporting the graphics display and the CPU (central processing unit). If it is less than 32K, think again, is it enough?

In short look out for a computer which offers all the points above and you will be sure of getting good value for money.

177 Willis Street, WELLINGTON.
154 Broadway Avenue, PALMERSTON NORTH.
115 King Street North, HASTINGS.
Cnr. Egmont and King Street, NEW PLYMOUTH.
Soon to open in Auckland, Hamilton and Tauranga.

Einstein
SCIENTIFIC LTD



For a copy of this advertisement and request to join our mailing list please write to us at P.O. Box 27158, Wellington.

The Computer World Made Simple.

	Partial	Binary Number
$428-2^8 = 428-256 = 172$		100000000
$172-2^7 = 172-128 = 44$		110000000
$44-2 = 44-32 = 12$		110100000
$12-2^3 = 12-8 = 4$		110101000
$4-2^2 = 4-4 = 0$		110101100

Continue this process with the fractional part. Don't forget the binary point in the answer!.

$.75-2^{-1} = .75-.5 = .25$	110101100.1
$.25-2^{-2} = .25-.25 = 0$	110101100.11

As you can see, to represent a decimal number slightly greater than 400 takes eleven digits in a binary number system. It can get quite unwieldy. Whilst it is perfect for computers because the number system parallels the way the electronics are used, it is not easy to look at a number and know what the value is, or even to remember the number. So for us mere mortals, the binary system is not a good choice.

HEXADECIMAL

What would happen if we were to group the binary digits into fours. The number of combinations available with four binary digits is sixteen, so we are converting from a base two system to a base sixteen system. BAse sixteen is called Hexadecimal.

You may have noticed that in each number system we need symbols to represent the numbers from zero to one less than the value of the base. So for a binary system, base 2, we need the symbols 0 and 1. We could use any shape, perhaps) to represent zero and @ to represent one, but it makes sense to borrow from those familiar decimal symbols. What do we do for a hexadecimal system, which needs sixteen symbols. Well, when we run out or decimal symbols at 9 we start using the alphabet, so we can draw the following table of number equivalents.

DECIMAL	HEXADECIMAL	BINARY
0	0	0
1	2	1
2	1	10
3	3	11
4	4	100
5	5	101
6	6	110
7	7	111
8	8	1000
9	9	1001
10	A	1010
11	B	1011
12	C	1100
13	D	1101
14	E	1110
15	F	1111
16	10	10000
17	11	10001
.	.	.
.	.	.
28	1C	11100
.	.	.
.	.	.
32	20	100000

Incidentally the hexadecimal equivalent of decimal 17, which is written as 11 is NOT said as eleven. It is one-one. Eleven, and other number such as sixteen, imply a decimal system. To make it even clearer is speech, we often talk about "one-one hex" or "hex one-one.

Now let's see what happens to our awkward binary number if we convert it to hexadecimal. Decimal 428 is equivalent to binary 110101100. Starting from the binary points, divide the number into groups of four digits, to get 1 1010 1100. The conversion to hexadecimal is done independently on each group,

TIMEGATE Software

Entering New Dimensions in Software

N.Z.'s NEWEST software distribution company.

We are dedicated to bringing low priced N.Z. Produced Software and peripherals to the N.Z. public.

ASTRO DEFENCE

for the Sega SC3000

As the sole survivor of the stricken earth BATTLE-SHIP "UNIVERSE", you must try and destroy the vicious Zarrog fleet before they destroy you. All you have left is your trusty "HI-CANNON".
Your heart is heavy, you are full of vengence for your lost comrades, but somehow deep inside you, you know it's a matter of time. The shields of your "H-CANNON" cannot withstand more than 20 hits in a row, but you fight on dauntless, knowing that all the training you have ever undertaken has been to prepare you for NOW! - THIS MOMENT, if you can take enough of them with you then the UNIVERSE'S sister ship "GALAXY" may stand a chance. The thought suddenly occurs to you - no-one will ever know of your conflict! No! the "fire-shield ratio analyzer" it will stay intact!! after the battle the people will know of your deeds - a postumous promotion, speeches-statues who knows maybe you will go down in history as the hero you really are. Suddenly, with that thought, you take on the vicious Zarrogs with renewed ferver. THEY WILL PAY!!!

Machine code program - very FAST
High resolution graphics;
Great sound effects

ALL this for only $16.95 (Inc. Postage and packaging)

We're on the lookout for N.Z. programmers.

If you are interested in getting your Software distributed in N.Z. while making money into the bargain, then contact us -
We'll do the rest.

P.O. Box 7259, WELLESLEY ST, AUCKLAND

We accept bankcard and VISA.

and from the table the hexadecimal number is 1AC. It looks a little strange at first but it is easier ot say, write and remember. They do exist, but it's not normal to encounter numbers with fractional parts in systems other than the decimal, so what could be an embarrassingly difficult part of the conversion between systems rarely occurs. It is perfectly legitimate to convert from decimal to hexadecimal directly, following the rules for binary conversion but using powers of sixteen instead of powers of two.

A number system that was popular in the old days (about six years ago!) but hich is seldom seen now, is the Octal system, which is based on powers of eight. You can derive an octal number from binary by dividing the binary number into three digit groups rather than the four digit grouping we used for hexadecimal.

All the arithmetic processes can be applied to any number base system, it's perfectly permissable to add two hexadecimal numbers together for instance.

The numbers to be combined arithmetically should all have the same base - you shouldn't subtract a binary number from a decimal number! The rules for arthmetic are exactly the same whatever the base. For instance in hexadecimal:

$$A + 7 = 11$$

"A", which is 10 decimal, plus 7, is 17 decimal, which is 16 + 1, which converts to 11 hexadecimal. With experience, you can add and subtract hexadecimal numbers without converting them to decimal.

What use is all this? First of all, if someone asks you how many you can count up to on one hand, you'll be able to make it to thirty one rather that five by treating each finger as binary digit. More importantly to programmers, an understanding of the binary and hexadecimal number systems is necessary before you can make too much headway with machine code. And with machine code, you're REALLY programing.

UNIVERSITY BOOK SHOP

Specialists in

COMPUTER BOOKS

Over 1000 titles in stock

PHONE OR WRITE: VISA/BANKCARD

STUDENT UNION BUILDING
34 PRINCES ST AND 34 KITCHENER ST
AUCKLAND 1
TELEPHONE 771 869

ATARI

available now-

the computer you grow into
—not out of!

- 100's of programs
- 256 colours
- 4 voices
- Super friendly basic
- Advance peripherals
- In-built diagnostics

- ATARI 400 Computer 16K $395.00
- ATARI 600XL Computer 16K $595.00
- ATARI 800XL Computer 64K $895.00
- ATARI 1010 Program recorder $199.00
- ATARI Disc Drive $995.00
- 64K RAM Expansion for 600XL $350.00
- ATARI Trakball $119.00
- ATARI Letter quality Printer $795.00
- ATARI Colour Printer $595.00
- Touch tablet $199.00

WEST CITY COMPUTER CENTRE
ARCADE 357 GREAT NORTH RD HENDERSON
PHONE 836-1567

Mail and phone orders with Visa and Bankcard welcome.
OVER NIGHT DELIVERY ANYWHERE IN N.Z.

EXPLORING THE SEGA
THE VISUAL DISPLAY PROCESSOR.

This month we have a look at the Visual Display Processor (VDP). The VDP is mapped at two port locations, &HBE and &HBF. These ports are the means by which the central processor communicates with Video Ram and VDP chip.

VIDEO RAM. The Video Ram (VRAM) is located of port &HBE. The processor can write or read the VRAM via this port. The programmer must us VPOKE or VPEEK to access the VRAM, POKE and PEEK access the normal user memory section of the computer, which stores only the program and variables.

TEXT SCREEN. The Text screen is comprised of 40 characters per line, and 24 lines of text. This means that a total of 960 characters may be displayed on the screen at any one time. Each character is made of a grid or matrix of 6 by 8 dots (pixels). The display used is called a "Memory Mapped display". This means that each character displayed on the screen has a specific location in which it is stored. The text screen starts in VRAM at &H3C00 and extends all the way to &H3FC0. Looking at the first line of the text screen and the address's being used:

1st character = &H3C00 2nd = &H3C01 40th = &H3C27

These locations may poked with values between &H20 and &HFF (32 255 decimal). Try the following program which illustrates the moving of a character along the top line of the screen by using the VPOKE method.

```
10 SCREEN 1,1: CLS
20 CH=&HF5: REM spaceship
30 FOR X=&H3C00 TO &H3C27
40 VPOKE X,CH
50 BEEP: VPOKE X,32
60 NEXT: STOP
70 REM Line 50 erases the ship
80 REM by poking a blank.
```

This could be used to develop a game where objects are moved about the screen etc, as an exercise, try rewriting it without the VPOKE commands and then compare the size and execution speed of the alternative program to the one above.

STRUCTURE OF THE VDP.

The VDP chip comprises eight (8 bit) write only registers, a read only (8 bit) statues register, and an autoincrementing (14 bit) address register. A REGISTER is temporary storage device, which stores information for later use. The VDP uses these registers to find information reguarding whereabouts the display information is located in Video Ram.

Register 7: Register 7 holds the COLOR for the writing/background combination. (&H12 gives black on green, more about this soon).

THE STATUS REGISTER: The SR is used for the TIME$ command, and sprite collision detection. The VDP generates a pulse every 20 milliseconds, this pulse is used by the Z80 central processing unit (CPU) or micro-computer to update the value of TIME$. SPRITE COLLISION DETECTION has already been covered in a previous SEGA INPUT column. However for those of you that missed the issue, here is the program again.

```
 10 SCREEN 2,2: CLS
 20 PRINT "Sprite collision demo."
 30 FOR DE= 1 TO 1600: NEXT DE
 40 PATTERN$#1,"FFFFFFFFFFFFFFFF"
 50 PATTERN$#2,"FFFFFFFFFFFFFFFF"
 60 SPRITE 0,(120,20),1,14: C=1
 70 FOR X= 0 TO 255
 80 IF  (INP(&HBF) AND 32) = 32 THEN
    GOSUB 120
 90 SPRITE 1,(X,20),2,C
100 IF INKEY$="" THEN GOTO 100
110 NEXT X: STOP
120 CURSOR 20,10: PRINT CHR$(5)
130 CURSOR 20,10: PRINT "Collision"
140 BEEP: C=4: RETURN
```


COMPUTER BOOKS

EASY GUIDE TO YOUR MACINTOSH

Next best thing to having your own personal expert to coach you step by step. "One Minute Recipes" serve as quick reminder for all steps. Everything you need to know is here in jargon free style.

SYBEX $38.95

POWER UP-KIDS GUIDE TO COMMODORE 64

Probably the earliest followed the most attractive book yet for kids - Learn how to draw pictures and designs, play games, change colours and slopes, create "movies" and much more.

SYBEX $29.95

COMMODORE 64 BASIC PROGRAMS IN MINUTES

Versatile ready to enter programs enable you to perform 65 home and business tasks. No knowledge of Basic is needed. Recommended guide.

SYBEX $38.95

BBC MICRO IN EDUCATION

Author takes you through the complexities of BBC - strings arrays, editing, graphics, subroutines etc. Includes 40 programs. Great for assisting children all ages, programming and how to study for exams.

SHIVA $25.95

COMMODORE 64 GAMES

Collection of 21 exciting programs specially for 64. Accompanying notes enable you to devise your own version of Basic.

DUCKWORTH $27.95

AUSTRALIA & NEW ZEALAND BOOK CO
PRIVATE BAG,
TAKAPUNA, AUCKLAND 9.
(09) 444-5346

WRITE FOR OUR FREE NEWSLETTERS & CATALOGUES.

The part of the program which actually detects for a sprite collision is

80 IF (INP(&HBF) AND 32) =32 THEN etc

This checks to see if any two sprites on the screen overlap by a single pixel (dot on the screen). If the two sprites do, the value returned from port &HBF will be equal to 32, so 32 AND 32 is always 32, so the THEN statement in line 80 is executed. If the value from port &HBF was equal to 128, then 128 AND 32 is equal to 0 (if you don't believe me try PRINT 128 AND 32) so the program continues on with line 90.

UPDATING A VDP REGISTER:

Two bytes are required to update or write to a register.

Byte 1	is the required data
Byte 2	is the required register

There is a ROM routine at &H2C54 designed to do just this. Load register C with the register number (0 - 7), load register A with the data to be written, then call &H2C54. This routine will write the date to the specified register.

EXAMPLE: Change the colour information of the text screen by directly writing to VDP register 7 using a ROM call.

```
10 SCREEN 1,1:CLS
20 PRINT " Black on Green"
30 FOR X = &HA000 TO &HA007
40 READ A : POKE X,A : NEXT
50 FOR DE = 1 TO 300 : NEXT
60 CALL &HA000
70 PRINT "Green on Black"
80 GOTO 80
90 DATA &H3E,&H21,&H0E,&H07
100 DATA &HCD,&H54,&H2C,&HC9
```

On return to Basic, ie after pressing break, you notice that the screen reverts to the original colour combination, black or green. This is because the Basic language gets the colour information for the text screen from address &H9339 in reserved RAM. The same result can be achieved by typing POKE &H9339, &H21.

WRITING TO VRAM: This was covered in a previous article. Simply load the HL register with the screen address than call the ROM routine at address &H2C44. Once that is done, you can output the value to port &HBE.

Note that the HL register of the Z80 microprocessor is loaded with the text screen address of &H3C14 in line 80 (the data 14, 3C). This is actually the 20th character on the first line, equal to &H3C14.

READING FROM VRAM: Load the HL register with the value of the address in VRAM that you desire to read, then call the ROM routine at address &H2C32. The data can then be read by imputting the value from port &HBE.

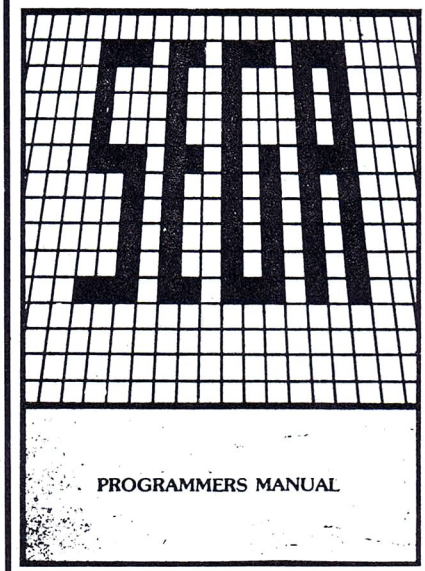
THE VDP REGISTER CONTENTS.

Bits	7	6	5	4	3	2	1	0
Register 0	0	0	0	0	0	0	M3	VDP
Register 1	16K	BLK	IE	M1	M2	0	SIZ	MAG

SPRITE ATTRIBUTE TABLE: At location &H3B00-- there are four bytes per sprite. These four bytes have the following characteristics. Sprite 0 occupies &H3B00 to &H3B03, Spirte 1 occupies &H3B04 to &H3B07 etc.

EC. Early clock bit. When a logic 1, the sprite is shifted 32 pisels to the left.
COLOR. 4 bits which control the colour of the sprite.

NOW AVAILABLE!



ONLY 24.95

SEGA PROGRAMMERS MANUAL By B. BROWN.

This manual is written with the more serious programmer in mind, and contains a wealth of information concerning sound graphics, and machine code information, sure to be of interest to the Sega enthuasiast.

Normal retail price will be $29.95. To obtain your copy for $24.95 cut out enclosed coupon and send to.

FREE POST NO. 671
Nomac Publishing Ltd,
P.O. Box 39-278
Auckland West

NAME:.....

ADDRESS:.....

.....

..... PH .....

NO STAMP REQUIRED

I enclose payment: ✓

☐ Visa ☐ Bankcard

Cardholder signature.....

Date card expires ....

Cheque ☐ Cheque No.....

Postal Order ☐ Postal note ☐

SPRITE PATTERN GENERATOR TABLE: At location &H1800 the eight by eight bit patterns of each sprite are stored. (ie, when you use PATTERN) Sprite 0 pattern is stored in locations &H1800 to &H1807, Sprite 1 in locations &H1808 to &H180F etc. Because the text patterns are also stored here, whenever the screen commands are used (ie SCREEN 1, 1), the contents of this VRAM area is saved in a buffer so that when the screen reverts back to normal, the original patterns are unchanged.

This is because the user will want either sprites or text patterns in these locations, but not both.

ERASING CHARACTERS ON THE GRAPHICS SCREEN: Try the following program:

```
10 SCREEN 2,2:CLS
20 FOR X=1000 TO 1050
30 CURSOR 150,0:PRINT " Score:";X
40 NEXT
50 END
```

After a couple of prints, you can't read the score at all. The way to overcome this is by using a print CHR$(5) command. This erases everything to the right of the current cursor position. Modify the program to that below:

```
10 SCREEN 2,2:CLS
20 FOR X=1000 TO 1050
30 CURSOR 150,0:PRINT CHR$(5)
40 CURSOR 150,0:PRINT " Score:";X
50 NEXT
60 END
```

The score is now readable for all values of X, instead of the previous shambles. The PRINT CHR$(5) in line 30 allows you to print in the same postion twice. Note however, that the PRINT CHR$(5) statement erases all information to the right of the cursor (except sprites). Its use must therefore be limited to close to the right hand edge, ie for displaying scores, etc, otherwise it sould erase part of your pictures or graphic displays.

A LITTLE PROGRAM TO CHANGE ALL PRINTS TO LPRINT: This program demonstrates how handy it is to know how the actual Basic command are stored in memory. From previous column, you have seen that the commands are stored as a single value (sometimes two values) in memory. The actual code for a PRINT statement is &H91, while a LPRINT statement is represented by &H92. This program searches through your program, and whenever it finds a PRINT statement, it replaces it with a LPRINT statement. The routine in lines 10 to 24 actually does this. The rest of the program is purely for demonstration.

```
10 AA=PEEK(&H8162):AB=PEEK(&H8163)
12 AC=(AB*256)+AA:AD=AC-65536
14 FOR X=&H9801 TO AD
16 IF PEEK(X)=&H91 THEN 20
18 NEXT:STOP
20 IF PEEK(X+1)=ASC("""") THEN
   POKE X+1,&H92
22 IF PEEK(X+2)=ASC("""") THEN
   POKE X+2,&H92
24 GOTO 16
30 SCREEN 2,2:CLS
40 PRINT "This is a test"
50 PRINT "Bye."
60 END
```

Lines 10 and 12 determine whereabouts the program ends in memory, while line 16 checks to see if the memory location contains a PRINT statement. If it does, the program branches to lines 20 24 which check to see if PRINT statement is followed by ", indicating that a text message does follow. If this test passes, is the program does find a ", then the PRINT statement is replaced by an LPRINT statement. All other lines of the program are tested, till finally the program stops in line 18. When you run the program, and it stops in line 18, LIST the program and you will see that all PRINT's have changed to LPRINT. The very same technique could be used to find variables and print on the screen as to what line numbers they occur in etc. Thats all for this month, Happy Hacking!.

TIMEGATE

Software

Entering New Dimensions in Software

N.Z.'s NEWEST software distribution company.

We are dedicated to bringing low priced N.Z. Produced Software and peripherals to the N.Z. public.

ASTRO DEFENCE

for the Sega SC3000

As the sole survivor of the stricken earth BATTLE-SHIP "UNIVERSE", you must try and destroy the vicious Zarrog fleet before they destroy you. All you have left is your trusty "HI-CANNON". Your heart is heavy, you are full of vengence for your lost comrades, but somehow deep inside you, you know it's a matter of time. The shields of your "H-CANNON" cannot withstand more than 20 hits in a row, but you fight on dauntless, knowing that all the training you have ever undertaken has been to prepare you for NOW! - THIS MOMENT, if you can take enough of them with you then the UNIVERSE'S sister ship "GALAXY" may stand a chance. The thought suddenly occurs to you - no-one will ever know of your conflict! No! the "fire-shield ratio analyzer" it will stay intact!! after the battle the people will know of your deeds - a postumous promotion, speeches-statues who knows maybe you will go down in history as the hero you really are. Suddenly, with that thought, you take on the vicious Zarrogs with renewed ferver. THEY WILL PAY!!!

Machine code program - very FAST
High resolution graphics;
Great sound effects

ALL this for only $16.95 (Inc. Postage and packaging)

We're on the lookout for N.Z. programmers.

If you are interested in getting your Software distributed in N.Z. while making money into the bargain, then contact us -
We'll do the rest.

P.O. Box 7259, WELLESLEY ST, AUCKLAND

We accept bankcard and VISA.

SOFTWARE INPUT

"SOFTWARE INPUT" file gives you the opportunity to have your programs, ideas or discoveries published. Please check that the programs are correct and please give a note explaining items such as graphics (the computer of course), the memory required and any part of the program which will be needed by fellow readers. We will pay between $ 2 and $30, depending on the size and quality of the program for each contribution published.

C. 64

BLOCK SAVE

This program will save to tape or Disc a part of R.A.M. If the save is to tape, it will be in the form of an 'absolute' file that will load only whence it was saved.

```
1 REM BLOCK SAVE
2 REM
3 :
10 PRINT"□":POKE53280,11:POKE53281,11:PRINTCHR$(158)
20 INPUT"DEVICE NUMBER";D
30 INPUT"■FILE NAME";F$:IFF$=""THEN30
40 POKE187,PEEK(71):POKE188,PEEK(72)
50 FA=PEEK(187)+256*PEEK(188)
60 POKE183,PEEK(FA)
70 POKE187,PEEK(FA+1):POKE188,PEEK(FA+2)
99 :
110 INPUT"START ADDRESS (HEX)";SA$
120 N$=SA$:GOSUB2000:SL=BL:SH=BH
199 :
200 INPUT"END ADDRESS (HEX)";EA$
210 N$=EA$:GOSUB2000:EL=BL:EH=BH
220 POKE251,SL:POKE252,SH
230 POKE186,D:POKE185,1
240 POKE780,251:POKE781,EL:POKE782,EH
250 SYS65496
260 END
299 :
2000 REM CONVERT HEX TO 2 DECIMAL BYTES
2010 :
2020 N=0
2030 FORI=1TOLEN(N$)
2040 :X=ASC(MID$(N$,1))-48
2050 :N=16*N+X+7*(X>9)
2060 NEXTI
2099 :
2100 BH=INT(N/256):BL=N-256*BH
2110 RETURN
```

VIC 20

AVOID THE NUCLEAR BOMBS

Tim Davey
Wellington.

1. Type in listing
2. 'Save' and 'Verify' it
3. Run as normal

Controls
H - left
J - right

10 points are scored for each bomb dodged

Object
To dodge the bombs for as long as possible without getting hit.

Hiscore
If you manage to beat the hiscore then you get to enter your name and your score becomes the high.

Pause
You may pause the game at anytime while playing by pushing 'U', to start again hit a key.
If you die hit a key to start again after your score is displayed.

```
5 POKE36869,255:POKE650,255:C=10:E=7953:Z=30720:SC=0:HI=500:N$="TIM.D.BEST":L$="
"
10 FORJ=0TO87
20 READA
30 POKE7168+J,A
40 NEXT
50 POKE36879,24
57 GOSUB4000:FORT=7424TO7431:POKET,0:NEXT
60 PRINT"□";:POKE36869,255:SC=0
70 POKE7974,0:POKE7996,1:POKE7975,2:POKE7997,3:POKE7976,4:POKE7998,5
71 POKE7974+Z,0:POKE7975+Z,0:POKE7976+Z,0
72 POKE7996+Z,0:POKE7997+Z,0:POKE7998+Z,0
80 R=INT(3*RND(1)+7688)
85 PRINT"■■■■■■■■■■■■■■■■■■■■■■■■■■■SCORE□";SC
87 PRINT"■■■■■■■■■HI:-";HI
90 POKEE,7:POKEE+Z,0
100 GETA$:POKEE,7:POKEE+30720,0:POKER,6:POKER+Z,0
105 IFA$="U"THENGOSUB6000
110 IFA$="H"THENG=-1:GOTO230
120 IFA$="J"THENG=1:GOTO230
130 POKER,32:POKER+Z,1:H=22:R=R+H
135 POKER,6:POKER+Z,32
140 IFR=ETHEN2000
145 IFR>7950THEN3000
150 FORT=1TOC:NEXTT
155 LETC=C-1
160 GOTO100
230 IFE=7954ANDA$="J"THEN100
235 IFE=7952ANDA$="H"THEN100
237 POKEE,32
240 E=E+G:IFE=RTHEN2000
245 IFE>7954THENE=7954
247 IFE<7952THENE=7952
250 POKEE,7:POKEE+Z,0
260 GOTO100
1000 DATA255,127,127,63,15,31,15,7,7,3,3,7,3,3,1,1,255,255,255,255,255,255,255,2
55
1010 DATA255,255,255,255,255,255,255,255,255,252,248,240,224,192,224,224,224,192
,224,240
1020 DATA192,224,192,128
1030 DATA90,126,60,60,60,60,24,24
1040 DATA24,24,60,90,153,36,36,102
```

```
1050 DATA129,66,0,24,24,0,66,129
1060 DATA16,48,127,255,127,48,16,0
1070 DATA8,12,254,255,254,12,8,0
2000 POKE36877,220
2010 FORH=15TO0STEP-1
2020 POKE36878,H
2030 FORM=1TO300:NEXT
2040 NEXTH
2050 POKE36877,0
2060 POKE36876,0:POKE36869,240
2070 PRINT"■";:PRINT"■■■■■■■■■■■BOOM!"
2080 PRINT"■■YOU GOT BLOWN TO BITS!"
2085 PRINT"■■SCORE";SC
2086 IFL$="Y"THENGOSUB5000
2087 PRINT"■■■HI";HI;"■BY "N$
2090 POKE198,0:WAIT198,1:POKE198,0
2100 GOTO60
3000 POKER,8:POKER+Z,0
3005 FORT=1TO50:NEXT:SC=SC+10:IFSC>HITHENHI=HI+10:L$="Y"
3010 POKER,32:GOTO80
4000 PRINT"■■■AVOID THE NUCLEAR"
4010 PRINT"■       BOMBS"
4020 PRINT"■■MOVE YOUR MAN ■G■ SO"
4030 PRINT"■HE DOESN'T GET HIT BY"
4040 PRINT"■THE FALLING BOMBS ■F"
4050 PRINT"■■YOU ARE ON A CLIFF ■■BD■■■■ACE";
4060 PRINT"■WHICH YOU CANNOT WALK"
4070 PRINT"■OFF."
4080 PRINT"■■YOU WILL HAVE A TERRI-BLE FATE IF YOU GET   BLOWN UP!"
4085 PRINT"■KEYS:H■IGJ■J■"
4090 PRINT"■■■■■■■■■■HIT A KEY"
4100 POKE198,0:WAIT198,1:POKE198,0
4110 RETURN
5000 PRINT"■■■■■A NEW HIGH!":POKE198,0
5010 PRINT"■■■■INPUT YOUR NAME"
5020 PRINT"■■■■■NAME"
5025 GOSUB7000
5030 HI=SC:L$="":RETURN
6000 PRINT"■■PAUSE■"
6005 FORT=1TO50:NEXT
6010 POKE198,0:WAIT198,1:POKE198,0
6020 PRINT"■■     ■"
6030 RETURN
7000 N$="":FORT=1TO10
7010 GETA$:IFA$=""THEN7010
7020 N$=N$+A$
7030 PRINT"■■■■■■■■■■■■■■■■■■■■";N$
7040 NEXT
7050 RETURN
```

16KZX81

Yahtzee

Julian Smith

WARKWORTH

This is my version of the dice game "Yahtzee" for the 16K ZX81. It can easily be adapted for the ZX Spectrum or the TRS80. When typing it in please note the following points:

1. All text printed at location 16,0; is 64 character spaces long. This ensures that each message completely covers the previous statement.
2. The dice have to be placed in a certain order for the scoring to work, hence subroutine 400.
3. I have used inkey$ rather than input to make sure people who know little about computers cannot stuff it up by typing incorrect things. This can be very easily altered.
4. Line 610 is the ZX81 equivalent of a Data statement. Alter this to suit your own machine.
5. Many subroutines can either be ommitted or altered to speed things up to suit the user's preference.

```
  3 POKE 16513,234
  5 GOSUB 100
 10 GOSUB 200
 15 GOSUB 300
 20 GOSUB 400
 25 GOSUB 500
 30 GOSUB 600
 35 GOTO 15
 40 GOTO 2100
 99 STOP
```

```
 100 PRINT AT 1,4;"▚▄▟▄▙▜▛
▜▛  "
 110 PRINT TAB 4;" ▞ ▀▀ ▙▗
▛▙  "
 120 PRINT TAB 4;"▀▀▀▀▀▀▀▀▀▀
▙▟  "
 130 PRINT AT 21,0;"PRESS ANY KE
Y TO PLAY"
 140 IF INKEY$="" THEN GOTO 140
 150 FOR F=0 TO 21
 160 SCROLL
```

```
 170 NEXT F
 180 LET HSC=0
 190 LET SC=0
 199 RETURN
 200 IF SC>HSC THEN LET HSC=SC
 210 LET SC=0
 220 DIM D(5)
 230 DIM S(13)
 240 LET TU=0
 299 RETURN
 300 PRINT AT 0,0;"HIGH SCORE ";
HSC;AT 0,20;"SCORE ";SC
 305 IF TU=13 THEN GOTO 40
 310 FOR F=1 TO 5
 320 LET D(F)=INT (RND*6)+1
 330 PRINT AT F*2,2;"DICE ";F;"
";CHR$ (CODE STR$ D(F)+128)
 340 NEXT F
 350 LET TH=1
 360 LET TU=TU+1
 399 RETURN
 400 PRINT AT 16,0;"DO YOU WANT
TO CHANGE THE ORDER       OF THE
 DICE ?(Y/N)          "
 405 LET U$=INKEY$
 410 IF U$="N" THEN RETURN
 420 IF U$<>"Y" THEN GOTO 405
 440 PRINT AT 16,0;"TYPE IN THE
NUMBERS OF THE DICE YOU    WANT
TO SWAP POSITIONS      "
 442 DIM X(2)
 444 FOR F=1 TO 2
 446 LIST U$=INKEY$
 448 IF U$>"5" OR U$<"1" THEN GO
TO 446
 450 LET X(F)=VAL U$
 452 PRINT AT 21,4*F;X(F)
 453 IF INKEY$<>"" THEN GOTO 453
 454 NEXT F
 460 LET X=D(X(1))
 464 LET D(X(1))=D(X(2))
 466 LET D(X(2))=X
 470 PRINT AT X(1)*2,9;CHR$ (COD
E STR$ D(X(1))+128);AT X(2)*2,9;
CHR$ (CODE STR$ D(X(2))+128)
 480 PRINT AT 21,4;"          "
 490 GOTO 400
 500 IF TH=3 THEN RETURN
 505 LET L=0
 510 PRINT AT 16,0;"  DO YOU WAN
T TO THROW ANY DICE
AAIN ? (Y/N)          "
 515 IF INKEY$<>"" THEN GOTO 515
 520 LET U$=INKEY$
 530 IF U$="N" THEN RETURN
 535 IF U$<>"Y" THEN GOTO 520
 540 PRINT AT 16,0;" TYPE IN THE
 NUMBER OF THE DICE       YOU WAN
T TO RE-THROW          "
 545 LET U$=INKEY$
 550 IF U$=STR$ L OR U$<"1" OR U
$>"5" THEN GOTO 545
 555 PRINT AT 21,4;U$
 558 LET L=VAL U$
 560 LET D(L)=INT (RND*6)+1
 564 PRINT AT 21,4;"  ";AT 16,0;
"    IS THAT ALL ? (Y/N)
                                "
 566 LET U$=INKEY$
 568 IF U$="N" THEN GOTO 540
 570 IF U$<>"Y" THEN GOTO 566
 575 LET TH=TH+1
 580 FOR F=1 TO 5
 585 PRINT AT F*2,9;CHR$ (CODE S
TR$ D(F)+128)
 590 NEXT F
 599 GOTO 20
 600 PRINT AT 2,0;
 610 LET L$="ACES,TWOS,THREES,FO
URS,FIVES,SIXES,THREE ALIKE,FOUR
 ALIKE,YAHTZEE,SM STAIGHT,LG SRA
IGHT,FULL HOUSE,CHANCE,"
 620 FOR F=1 TO 13
 630 IF S(F)=0 THEN PRINT TAB 16
F;TAB 18;") ";
 640 IF S(F)=0 AND L$(1)<>"," TH
EN PRINT L$(1);
 650 IF L$(1)="," THEN GOTO 680
 660 LET L$=L$(2 TO )
 670 GOTO 640
 680 LET L$=L$(2 TO )
 690 NEXT F
 700 PRINT AT 15,0;" TYPE IN YOU
R SELECTION OF THE       ABOVE "
"MENU"" (NUMBER ONLY)  "
 710 INPUT L
 730 IF L>13 OR L<1 OR L<>INT L
THEN GOTO 710
 740 IF S(L)<>0 THEN GOTO 710
 760 IF L<7 THEN GOTO 800
 770 IF L=13 THEN GOTO 1000
 775 IF L=7 OR L=8 THEN GOTO 900
 780 IF L=9 THEN GOTO 1100
 785 IF L=10 OR 11 THEN GOTO 120
0
 790 GOTO 1300
 800 FOR F=1 TO 5
 810 IF D(F)=L THEN LET S(L)=S(L
)+L
 820 NEXT F
 830 IF S(L)=0 THEN LET S(L)=-10
 840 GOTO 2000
 900 PRINT AT 16,0;"ENSURE THAT
YOUR ";L-4;" OF A KIND ARE ON TH
E LOWEST DICE NUMBERS    "
 910 GOSUB 9000
 930 GOSUB 400
 940 FOR F=1 TO L-4
 950 IF D(F)<>D(1) THEN LET S(L)
=-10
 960 NEXT F
 965 FOR F=1 TO 5
 970 IF S(L)<>-10 THEN LET S(L)=
S(L)+D(F)
 980 NEXT F
 990 GOTO 2000
1000 FOR F=1 TO 5
1010 LET S(L)=S(L)+D(F)
1020 NEXT F
1030 GOTO 2000
1100 FOR F=1 TO 5
1110 IF D(F)<>D(1) THEN GOTO 114
0
1120 NEXT F
1130 LET S(L)=60
1140 LET S(L)=S(L)-10
1150 GOTO 2000
1200 IF L=11 THEN GOTO 1250
1210 PRINT AT 16,0;"ENSURE THAT
THE DICE ARE IN YOUR         STRA
IGHT IS DICE 5          "
1225 GOSUB 9000
1240 GOSUB 400
1250 PRINT AT 16,0;"ENSURE THAT
THE STRAIGHT IS IN          O
RDER                  "
1252 GOSUB 9000
1255 PRINT AT 16,0;"AND THE LOWE
ST NUMBER IS ON          DICE
 1          "
1257 GOSUB 9000
1258 GOSUB 400
1260 FOR F=2 TO L-6
1265 IF D(F)<>D(F)+1 THEN GOTO 1
280
1270 NEXT F
1273 LET S(L)=40
1277 IF L=11 THEN LET S(L)=50
1280 LET S(L)=S(L)-10
1290 GOTO 2000
1300 PRINT AT 16,0;"MAKE SURE YO
UR PAIR (2) IS ON       DICE 1
AND DICE 2          "
1303 GOSUB 9000
1307 GOSUB 400
1310 IF D(1)=D(2) AND D(3)=D(4)
AND D(5)=D(4) THEN LET S(12)=35
1330 LET S(12)=S(12)-10
1340 GOTO 2000
2000 LET SC=0
2005 FOR F=1 TO 13
2010 LET SC=SC+S(F)
2020 PRINT AT F,16;"
     "
2030 NEXT F
2040 IF S(1)+S(2)+S(3)+S(4)+S(5)
+S(6)>=63 THEN LET SC=SC+35
2050 RETURN
2100 PRINT AT 16,0;" GAME OVER @
@ YOU WANT ANOTHER          GAME
 @ Y/N                "
2200 LET U$=INKEY$
2300 IF U$="N" THEN GOTO 50
2400 IF U$<>"Y" THEN GOTO 2200
2500 GOTO 10
9000 PRINT AT 18,0;"HIT A KEY"
9010 IF INKEY$="" THEN GOTO 9010
9020 PRINT AT 18,0;"                "
9030 IF INKEY$<>"" THEN GOTO 903
0
9040 RETURN
```

COMPUTER INPUT

SEGA SC3000

Duckshoot

T. Johnson

KAIKOHE

In this program you control a man using ↑, ←, → and spacebar (fire) to shoot at ducks flying overhead. Instructions are included in the program. If you find shooting directly upwards too easy, delete line 550. In the interests of speed "Duckshoot" moves the duck sprite by V poking into the video ram the ducks X co-ordinate (&H3B01). This is much faster than using the "Sprite" command, especially when changing only one co-ordinate.

```
10 GOSUB 1760
20 HSC=0:GOTO 940
30 SCREEN 2,2:CLS
40 SH=0
50 MAG 1
60 PATTERN S#0,"000000000058384F"
70 PATTERN S#4,"000000000018780F"
80 PATTERN S#1,"0300000000000000"
90 PATTERN S#5,"0300000000000000"
100 PATTERN S#2,"00000000000002FE"
110 PATTERN S#6,"000000307878FBFE"
120 PATTERN S#3,"F8F8787830000000"
130 PATTERN S#7,"F800000000000000"
140 PATTERN S#8,"0000180804060505"
150 PATTERN S#9,"0301010102060000"
160 PATTERN S#10,"008078F87878E4C0"
170 PATTERN S#11,"C0C0804020600000"
180 PATTERN S#12,"00011E1F1E1E2703"
190 PATTERN S#13,"0303010204060000"
200 PATTERN S#14,"0001810206040A0A0"
210 PATTERN S#15,"C080808040600000"
220 PATTERN S#16,"0000010107070301"
230 PATTERN S#17,"0303030302020200"
240 PATTERN S#18,"0020A0A0E0E0E0A0"
250 PATTERN S#19,"E0E0E0E040404000"
260 PATTERN S#20,"00000000000407F"
270 PATTERN S#21,"1F1F1E1E0C000000"
280 PATTERN S#22,"0000000001A1CF2"
290 PATTERN S#23,"C000000000000000"
300 PATTERN S#24,"0000000C1E1EDF7F"
310 PATTERN S#25,"1F00000000000000"
320 PATTERN S#26,"0000000000181EF0"
330 PATTERN S#27,"C000000000000000"
340 PATTERN S#28,"0000000000000001"
350 PATTERN S#29,"0100000000000000"
360 PATTERN S#30,"0000000000000080"
370 PATTERN S#31,"8000000000000000"
380 REM SET UP SCREEN
390 COLOR 15,4,(0,0)-(255,130),1
400 COLOR 15,12,(0,130)-(255,191),1
410 REM SET VARIABLES
420 PO=12
430 Z=INT(RND(1)*3)+2
440 H=INT(RND(1)*50)+20
450 D=INT(RND(1)*2)+1
460 FLAP=0:IN=1
470 REM SET BIRD
480 SPRITE 0,((ABS(255*(D=2))),H),0,1
490 SPRITE 1,(127,140),12,1
500 SPRITE 2,(127,140),28,0
510 REM MAN'S POSITION
520 A$=INKEY$:IF A$="" THEN GOTO 580
530 IF ASC(A$)=28 THEN PO=12
540 IF ASC(A$)=29 THEN PO=8
550 IF ASC(A$)=30 THEN PO=16
560 IF ASC(A$)=32 AND SH=0 AND COUNT<1
0 THEN COUNT=COUNT+1:GOSUB 1120
570 VPOKE &H3B06,PO
580 RETURN
590 REM MOVE BIRD
600 IF D=1 THEN 730
610 XB=VPEEK(&H3B01)
620 XB=XB-Z:IF XB<0 THEN VPOKE &H3B03,
0:GOTO 850
630 VPOKE &H3B01,XB
640 IF FLAP=2 THEN VPOKE &H3B02,4:FLAP
=FLAP-1:IN=-1:GOTO 690
650 IF FLAP>0 THEN 680
660 FLAP=FLAP+1:IN=1
670 VPOKE &H3B02,0
680 REM
690 FLAP=FLAP+IN
700 IF VPEEK(&H3B02)=0 THEN SOUND 5,2,
10
710 IF VPEEK(&H3B02)>0 THEN SOUND 5,2,
0
720 RETURN
730 XB=VPEEK(&H3B01)
740 XB=XB+Z:IF XB>254 THEN VPOKE &H3B0
3,0:GOTO 850
750 VPOKE &H3B01,XB
760 IF FLAP=2 THEN VPOKE &H3B02,24:FLA
P=FLAP-1:IN=-1:GOTO 810
770 IF FLAP>0 THEN 800
780 FLAP=FLAP+1:IN=1
790 VPOKE &H3B02,20
800 REM
810 FLAP=FLAP+IN
820 IF VPEEK(&H3B02)=24THEN SOUND 5,2,
0
```

```
830 IF VPEEK(&H3B02)=20THEN SOUND 5,2,
10
840 RETURN
850 H=INT(RND(1)*50)+20
860 SOUND 0
870 FORAA=1TOINT(RND(1)*67):BB=RND(1):
NEXT
880 D=INT(RND(1)*2)+1
890 Z=INT(RND(1)*3)+2
900 SPRITE 0,((ABS(255*(D=2))),H),0,1
910 FLAP=0:N=1
920 SH=0:VPOKE &H3B0B,0
930 RETURN
940 GOSUB 30
950 GOSUB 590
960 IF COUNT>9 AND SH=0 THEN GOTO 1030

970 IF SH>0THEN GOSUB 1160
980 IF INKEY$="D" THEN 1900
990 SOUND 1,,0
1000 IF SH=0THEN VPOKE&H3B0B,0
1010 GOSUB 510
1020 GOTO 950
1030 CURSOR 40,20:PRINT" YOUR SCORE :"
;SCR;" POINTS"
1040 SOUND 0
1050 IF SCR>HSC THEN HSC=SCR:GOTO 1610

1060 PRINT:PRINT"      The HIGH-SCORE i
s";HSC
1070 PRINT:PRINT"      Press any key to
 try again."
1080 IF INKEY$<>""THEN 1080
1090 IF INKEY$=""THEN 1090
1100 SCR=0:COUNT=0
1110 GOTO 940
1120 SOUND 4,2,15:FOR AA=15 TO 5 STEP
-5:FORBB=1TO2:NEXT:SOUND 4,2,AA:NEXT:S
OUND 0
1130 SH=127:SD=PO:UP=16
1140 XS=127:YS=130:VPOKE&H3B08,YS:VPOK
E &H3B09,XS:VPOKE &H3B0B,15
1150 SOUND 1,(191-YS)*20+110,13
1160 SOUND 1,(191-YS)*10+110,13
1170 IF SD=16 THEN 1290
1180 IF SD=12 THEN 1370
1190 XS=XS-4.3
1200 UP=UP-1
1210 YS=YS-UP
1220 IF XS<0 OR YS<0 THEN SH=0:RETURN
1230 VPOKE &H3B08,YS
1240 VPOKE &H3B09,XS
1250 IF YS+8>H AND YS-8<H THEN 1270
1260 RETURN
1270 IF XS+8>VPEEK(&H3B01) AND XS+8<VP
EEK(&H3B01)+16THEN 1470
1280 RETURN
1290 YS=YS-UP
1300 UP=UP-1.05
1310 IF YS+8>H AND YS-8<H THEN 1330
1320 GOTO 1340
1330 IF VPEEK(&H3B01)>XS-9AND VPEEK(&H
3B01)<XS+9THEN 1470
1340 IF YS>191 THEN SH=0:RETURN
1350 VPOKE &H3B08,YS
1360 RETURN
1370 XS=XS+4.3
1380 UP=UP-1
1390 YS=YS-UP
1400 IF YS+8>H AND YS-8<H THEN 1420
1410 GOTO 1430
1420 IF XS>VPEEK(&H3B01)-8 AND XS<VPEE
K(&H3B01)+8 THEN 1470
1430 IF XS>255 OR YS<0 THEN SH=0:RETUR
N
1440 VPOKE &H3B09,XS
1450 VPOKE &H3B08,YS
1460 RETURN
1470 VPOKE &H3B0B,0:VPOKE &H3B08,130:V
POKE&H3B09,127:SH=0
1480 CURSOR XS,YS
1490 SCR=SCR+100-H:PRINT100-H
1500 SOUND 4,2,15:FOR AA=15 TO 5 STEP
-5:FORBB=1TO2:NEXT:SOUND 4,2,AA:NEXT:S
OUND 0
1510 VPOKE &H3B02,4
1520 VPOKE &H3B0B,0
1530 FOR A=H TO 191 STEP 2
1540 SOUND 2,2100-A*10,15
1550 VPOKE &H3B00,A
1560 NEXT A
1570 SOUND 0
1580 FOR AA=XS TO XS+24:FOR BB=YS-6 TO
 YS+6:PRESET(AA,BB):NEXT BB:NEXT AA
1590 SOUND 0:HITS=HITS+1:COUNT=COUNT+1

1600 GOTO  850
1610 PRINT:PRINT"     That is the new H
IGH-SCORE."
1620 N=277:GOSUB 1730
1630 N=277:GOSUB 1730
1640 N=294:GOSUB 1730
1650 N=311:GOSUB 1730
1660 N=311:GOSUB 1730
1670 N=349:GOSUB 1730
1680 N=349:GOSUB 1730
1690 N=370:GOSUB 1730
1700 N=370:GOSUB 1730
1710 N=370:GOSUB 1730
1720 SOUND 0:GOTO 1070
```

```
1730 SOUND 1,N,15
1740 FOR AA=1TO40:NEXT
1750 RETURN
1760 CLS:CURSOR 7,0:PRINT"DUCK SHOOT B
y T.Johnson":CURSOR 5,10:PRINT"Do you
require instructions ";:INPUT A$
1770 IF LEFT$(A$,1)="N" THEN RETURN
1780 CLS:COLOR 15,1
1790 PRINT"                Instructions"
1800 PRINT"                             "
1810 PRINT:PRINT"  This is the game of
 DUCK SHOOT.        The object , surpri
singly , is to     shoot ducks."
1820 PRINT"  There is an unlimited sup
ply of       ducks but you only have TE
N bullets."
1830 PRINT"  This means you can play i
t safe and  only go for the lower ones
 or try      for the higher ducks with
             correspondingly higher poi
nts."
1840 PRINT:PRINT"  Use the arrow keys
to change the      shooter's position a
nd the space bar  to fire. Press D key
 if you do not    want to shoot at the
 duck (Gives new  duck)."
1850 PRINT:PRINT:PRINT"                GOO
D SHOOTING!!"
1860 PRINT:PRINT"        Press any key
to start."
1870 IF INKEY$<>""THEN1870
1880 IF INKEY$=""THEN1880
1890 RETURN
1900 IF D=1 THENVPOKE&H3B01,250
1910 IF D=2 THENVPOKE&H3B01,5
1920 GOTO 990
```

If you find shooting directly upwards too easy, delete 550

Line 1800 should read....

```
1800 PRINT"                    ______________"
```

But doesn't as the underlining character can't be printed by the printer.

SPECTRUM

TROOPER

C. Lawton
Paraparaumu.

TROOPER: Land the paratrooper on the pad using the keys 9 & 0

```
  10 GO SUB 1000: GO TO 7000
1000 FOR t=USR "a" TO USR "h"+7
1010 READ s: POKE t,s
1020 NEXT t
1030 DATA 255,255,195,255,195,19
5,195,195
1080 DATA 56,56,16,124,16,16,40,
68
1090 DATA 0,0,0,0,3,7,15,15
1100 DATA 0,0,0,0,192,224,240,24
0
1110 DATA 8,8,4,2,1,0,0,0
1120 DATA 0,0,0,0,129,66,36,24
1130 DATA 8,8,32,64,128,0,0,0
1140 DATA 0,24,60,66,129,66,60,2
4
1142 REM "A B CD EFG H"
1144 REM "▒ ▒ CD EFG H"
1150 RETURN
7000 LET g=2: LET sc=0
7010 BORDER 6: PAPER 7
7100 FOR w=1 TO 7: CLS
7200 FOR t=1 TO 30: PRINT AT 19,
t; INK 4;"H"
7210 NEXT t
7500 PLOT 248,16: DRAW 0,159: PL
OT 7,16: DRAW 0,159
8005 LET d=15: LET u=INT (RND*23
)+5
8100 FOR e=g TO 19
8120 LET d=d-(INKEY$="9")+(INKEY
$="0")
8129 PRINT AT e-3,d-1;"      "
8130 PRINT AT e-2,d-1; INK 1;" C
▒D "
8132     PRINT AT e-1,d-1; INK 5;
" EFG "
8135 PRINT AT e,d+1;"▒▒"
8142 PRINT AT 19,u;"▒"
8145 IF e=18 AND u=d+1 THEN GO T
O 8200
8150 IF d=0 OR d=29 THEN BEEP .5
,22: PRINT AT 20,3;"YOU HIT THE
SIDE ": GO TO 8250
8170 BEEP .002,20: NEXT e
8172 FOR t=1 TO 15
8175 PRINT AT 19,d; INK 2; FLASH
 1;"▒ ▒": BEEP .02,t
8176 NEXT t
8190 GO TO 8250
8200 PRINT AT 19,u;"▒": LET sc=s
c+1: PRINT AT 20,1;"GOOD LANDING
   PARA'S LANDED=";sc: BEEP .07,
18: BEEP .07,19: BEEP .3,20
8250 PAUSE 70
8260 LET g=g+1
8300 NEXT w
8400 CLS : PRINT '''"PARATROOPER
S LANDED="; PAPER 6;sc
8410 PRINT '"PARATROOPERS KILLED
="; PAPER 6;7-sc
8420 PRINT ''"ANY KEY , TO GO AG
AIN"
8430 PAUSE 0: GO TO 7000
```

REWARDS

Dear Sir,

I have spotted an error on page 29 of the May/June issue. Lines 40, 146 and 3146 incorporate a "GOSUB 8000", but there is no line 8000 anywhere in the program.

M. Penwill

In the July issue of "Computer Input" ZX Spectrum Pattern Program.
Line 145, 495, 600, 1260, 3070, 3080 uses GOTO 150 statement. But there is no LINE 150 in the program.

ED NOTE

On most computers a jump (GOTO or GOSUB) to a line that does not exist gives an error. However the Sinclair ZX81 and Spectrum computer do allow you to do this.

```
eg.  10 GOSUB 1000
     20 PRINT "FINISHED"
     30 END
     1001 PRINT "SUBRONTINE"
     1002 RETURN
```

This program does actually work on the above computers — strange eh!.

Dear Editor,

Having just bought my first home computer, I rushed home, keen and eager to try Nigel Irwin's Galaxians program on page 2 of the magazine which A.V.M. gave me for free.

I keyed it in, removed my one fingered typing blunders, and watched by two young video games addicts, observed yellow sprites banging and firing their way across the sreen in front of a starry night sky. Oh the power of home computers!.

While the space pilots were pressing buttons I had a closer look at the program, and have found 4 distinct queries or mistakes.

1. We tried the Z key, the X key and the N key and observed results, but the M key produced nothing. In line 150 RS is tested for "M", but never filled, so 0 = 0 + 5 is never executed — probably just as well, as 0 has no restrictions to keep it within the bounds of screen size. Line 150 is unneccessary, never executed, and therefore a program mistake.
2. Line 140 puts a random number into D, but D is not used in any other part of the program, so this line is also a program error.
3. Line 210 : T = P + 6 T is not used in the program between line 130 and the end, so this statement is also excess garbage.
4. In the loop which places the coloured stars randomly in the sky, lines 30 to 80, one statement is in the wrong position.

60 PSET (K, L),T places a star at position K, L, calculated in lines 40 & 50, with colour T, not calculated until 70. If line numbers 60 and 70 are exchanged, this will be correctly ordered.

Congratulations on your new magazine I am eagerly looking forward to more SEGA programs to try.

Jay Jackson

Dear Sir,

I have found a error in the harbour program written by John Perry for the sega (July issue). The problem arises when you've finished your first game and started your second. Once it has drawn yp the screen your plane crashes automatically. This is because the variables for damage haven't been changed from the last game. To fix this add on too the end of line 1700 "HP= O: DTH = O".

Also once you get onto the second round "next round" isn't erased from the screen. By deleting 'GOTO 1334' will fix this.

You can also prevent waiting 15 seconds for a second game by adding ":BLINE (0,161) - (255,19),,BF" at the end of line 1428 and deleting "GOTO 10" at the end of line 5690 and adding "BLINE (102,90) - (160,99),,BF: GOTO 1331".

Theres also an error in the tank program written by K. Dwen. After playing a few games of tank the program crashes on a 'Gosub nesting error'.

William Lau

Dear INPUT,

In your 16K ZX81 listing of "Moon Patrol" out of your May issue of Computer Input there is an error. When I run this run this program an error sign 2/580 appears after the printing of the screen, I have not been able to find the error but the program certainly doesn't work. Also some the strings were unreadable.

I also do not understand how to enter the machine code routines for the ZX81 which were printed in the April edition of your magazine.

Could you please send me more information about the machine code routines and the "Moon patrol" program. Thank you!.

Robert Rowan

Dear Sir,

While typing in the program "Pattern Program", which appeared in the July issue of "Computer Imput" for the ZX Spectrum, I found a mistake.

It appeared in lines 483 a 551. They read:
DRAW 120,3", a. They should read:
DRAW 120,32, a.

Michael McDowall

Error in July issue of "Computer Input" page 35 Russian Roulette program.
LINE 160 READS
160 PRINT: PRINT "How many wish to play (up to five)" : : INPUT A

The line should read
160 PRINT: PRINT "How many wish to play (up to five)." : INPUT A

Peter Young

Dear Computer Input,

I believe I have found a small mistake in the program 'Jackpot' for the Sega SC 3000 (July Issue). In line 500 it says "..CURSOR 60 150.." There should be a comma between 60 and 150.

Chris Robinson

Congratulations!
$5 on the way to you all!

COMPARE OUR PRICES!

PLUS BACKUP SERVICE AND GUARANTEE

OVERNIGHT DELIVERY N.Z. WIDE

PHONE OR SEND YOUR ORDER NOW!

YOUR CHOICE! **$895**

COMMODORE C64
OR 1541 DISK DRIVE
CN2 DATASETTE $125

Buy Spectrum 48K at $599
Get a Software 'Six Games Pack' Worth $300 for **FREE!**

THE QL IS HERE

COMMODORE SX64 $3325
FREE 801 PRINTER & SOFTWARE

INTERFACES $159 & $249
(Freely Available)

- **EASY FINANCE With 20% Deposit**
- **ALL CREDIT CARDS ACCEPTED (Except Sale Items) Include Credit Card Number and Expiry Date of Card.**
- **SEND CHEQUE, M.O., ETC., PLUS $10 P & P**
- **PHONE OR WRITE NOW! Mon.-Sat. 10 a.m.-6 p.m.**

manukau COMPUTERS (N.Z.) LTD.
PHONE AK 656-002
P.O. Box 26-074 AUCKLAND 3
CORNER MANUKAU & PAH RDS - EPSOM

COMPUTER GAMES FOR HIRE

Games available for weekly hire for the following computers.

★ ATARI 400/800 ★
★ APPLE ★
★ TRS 80/SYSTEM 80 ★
★ VIC 20★
★ BBC ★
★ C-64 ★

Send for catalogue and membership details to:

COMPUTER GAME
RENTALS
P.O. BOX 30947
Lower Hutt

Name _____

Address _____

_____

Type of Computer _____

RICHLEY Industries Ltd.

P.O. BOX 7259, WELLESLEY ST., AUCKLAND.

SOFTWARE UPDATE

The latest software for Computers

Commodore 64, Spectrum, Sega, VIC 20 and ZX81

FREE Membership

SPECIAL OFFER ***SPECIAL OFFER*** ***SPECIAL OFFER***

Members special "discount prices."

» write now for membership form, giving details of your computer «

Name.....

Address.....

.....

Software Club

BUYSELLSWAP

Free to all our readers (ONE ENTRY ONLY!)

I would like to get hold of some BBC games. I would swap them with listings of Fisherman Fred, Asteroid Chase, Holy Grail, School of Death, Breakout, Solitaire, Stuka, Connect four, Bertie, and more besides. I am especially interested in arcade and adventure games. If possible, could they be sent on either tapes or listings. Programs I would be really interested in are: The Hobbit (from Melbourne House), Zalaga (from Hardvark Software), Orion (from Software Projects), Pharoh's Tomb (from A & F Software) and The Valley (from ASP Software).

Please contact:
Duncan Wyley
5 Margaret St.
Tokoroa
Sth Waikato
or ph. 66-377 after 7 o'clock

FOR SALE
Gridrunner $20.00
Galactic panic $20.00
The vic 20 games book
Owen bishop $17.00
Getting started on your Vic 20
Tim Hartnell and Mark Ramshaw $7.00
Games for Vic 20 $7.00
COMPUTER BATTLEGAMES
COMPUTER SPACEGAMES $3.00
Introduction to computer programming
Understanding the micro
Usborne guide to computers
Ph. 842-378
Alan Young
After 6pm
WELLINGTON
All prices negotiable.

FOR SALE/SWAP: Sega Games on cassette. 'Type attack', 'Mars adventure', 'Watch me draw' 'Mars Patrol'. Also Music Cartirdge (worth $149) $80 or swap for other cartridges.

F. Heron
15 Amokura St,
ROTORUA
Ph. 83-431

Please could somebody help me with a SHIP/PLEASURE BOAT NAVAGATIONAL PROGRAM (Preferably Sega)

W.A. Hearn
C/o Satelite Earth
Station Warkworth

FOR SALE ZX81 — 16k ram, auto cassette control, internal power supply all enclosed in large case, full size keyboard, printer and paper, new cassette player,leads and manual plus large selection of mags. $400.00.

Mr P.R. Boyce
135 Dobson St,
ASHBURTON.
Ph 83664.

One flight simulation game for $20 or swap for another software game. This is for the 48k Spectrum that flight simulation works on not 16k.

Kane Wallace
3 Temotu Rd,
PUKERUA BAY

FOR SALE C 64 programs Repton (on disk) $40 Pakacuda (on tape) $20 Chess Grand Master (on tape) $25.

Phone Whakapara 396 or write
K.D. Memefy
RD 1
HUKERENUI

FOR SALE — ATARI 600 XL Computer, 1010 programme recorder, and seven games cartidges. All in as new condition. Cheap at $600 ono.

Write to
Gary Brennan
103 Great North Rd
WANGANUI

BBC OWNERS, Genuine reason for sale! Various Software packages for the BBC on disc ranging from games to business software. NZ value $2000.00. Any offers?

Write to
A.J. Phillips
44 George St
GERLDINE

FOR SALE Commodore VIC 20. Datasette, Joystick, Expansion Board, 3K Super-Expander, 8K Expansion cartridge and taped software. Many handbooks and literature. All excellent con.

For further details contact:
M.J. Meacheam
2/20 Barnett Street,
PUTARURU.
Ph. 7174

I am now the proud owner of Commodore 64, and thoroughly enjoy the magazine you are producing. Keep up the good work.

FOR SALE — Two cassette games
Krazy Kong (Unexpanded) — $10.
Defenda (+8K expansion) — $15

Contact:
Grant Drake
17 Holdaway Ave
Northcote
AUCKLAND 9
Phone: 489-207
(4pm - 8 pm, not Thursdays)

"48K Spectrum" owners who wish to swap software please write to this address:
1 Rotomahana Ave,
Remuera,
AUCKLAND 5
I have over 110 programs including many chart toppers!!.
D. MacKenzie

COMPUTER INPUT

Tell us what you'd like to see in COMPUTER INPUT Magazine.

BACK COPIES!

The following list shows the current situation for back issues for Computer Input magazine.

OCTOBER	'83	UNAVAILABLE
NOVEMBER	'83	UNAVAILABLE
DECEMBER	'83	"
FEBRUARY	'84	VERY LIMITED
MARCH	'84	VERY LIMITED
APRIL	'84	LIMITED
MAY/JUNE	'84	VERY LIMITED
JULY	'84	UNAVAILABLE
AUGUST	'84	AVAILABLE

Copies are available at $1.50 each from

BACK ISSUES
COMPUTER IMPUT MAGAZINE
PO. BOX 30002
TAKAPUNA NORTH
NO STAMP NEEDED

HARRIS Electronics

Specialists in Conversion of overseas computers to NZ televisions

* Efficient Personal TV Repair Service

* Stockists of COMMODORE computers, Disk Drives, Software, etc.

653 Manukau Rd.
Epsom, Auckland
opposite One Tree Hill Domain Entrance
P.O. Box 84-017 Auckland

Telephone 658-416

WIN A HOME COMPUTER

COMPUTER INPUT magazine each month brings you competitions, help in buying computers, regular columns on **Commodore 64, Spectrum, Colour Genie, Sega, JR 100, VIC 20 and ZX81** computers.

We review the latest Hardware, Peripherals and Software available in New Zealand and feature over 12 pages of Software Listings for you to load on most popular computers.

SUBSCRIBE TODAY ONLY $13

Visa/Bankcard/Cheque
Expiry Date.....

FREE POST NO. 671
Nomac Publishing Ltd,
PO. BOX 30002
TAKAPUNA NORTH

Name .....
Address .....

Visacard
Bankcard

Or Phone us AK: 496-943

C L U B S

"NZ MICRO"

Club has existed since 1977, and was formed to develop and foster interest in all aspects of the microcomputer.

Club activities include an annual exhibition, a computer bulletin board system and regular computer workshops in which members have an opportunity to investigate and solve any problems they may have with their microcomputers.

An annual subscription fee of $12.00 is levied, payable half yearly or annually. This fee also covers all members of a family. For school students the membership fee is $6.00 per year. A member is entitled to receive a copy of 'NZ MICRO', our bimonthly club magazine, and access to the club library which holds current copies of most computer magazines, and is entitled to purchasing discounts available through our club purchasing officer.

The club encourages the formation of user groups by members of the club who have specialist interest. Several such groups exist, and hold meetings on a monthly basis. Details of these groups are available from the club secretary, or from the club magazine.

Club meetings are held on the first Wednesday of each month starting at 7.30 pm. Generally a talk is given on some aspect of microcomputers, and there is an opportunity to meet and exchange ideas with other members. Workshops are held the following Saturday from 10.00 am to 5.00 pm. The address is 107 Hillsborough Rd, Mt Roskill.

IBM Personal Computer User Group

The PC User Group Convenor,
Terry Bowden,
65 Vauxhall Rd, Devonport,
Ph: 452-639 (AH), 778-910 (Bus).

SPECTRAVIDEO - WELLINGTON

Club secretary is Don Stanley. Ph 896-379, address is c/- P.O.Box 7057 or c/- P.O. Bos 2197 in Wellington, or c/- Epidemiology Unit, Wellington Hospital.

Club treasurer is Colin Chin, P.O. Box 2197 Wellington.

SEGA - TOKOROA

SEGA USERS GROUP
TOKORUA
c/o GEOFF 1 PIO PIO PL
PH 67-105

CHRISTCHURSH COLOUR GENIE USERS GROUP
27 CAUDRON RD
CHRISTCHURCH 4
PH. 881-456

SOUTH CANTERBURY COMPUTER USERS GROUP
P.O. BOX 73
TIMARU.

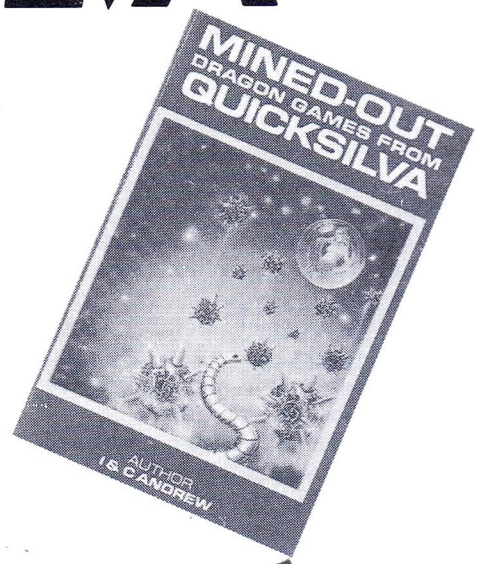
MSX/ SPECRAVIDEO COMPUTER CLUB.
P.O. BOX 22620
OTAHUHU

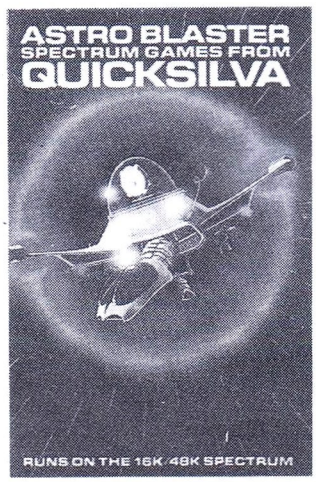
Contact:- Brain 444-3123 or
Doug 818-8881 Between
7.30 and 9.00 pm

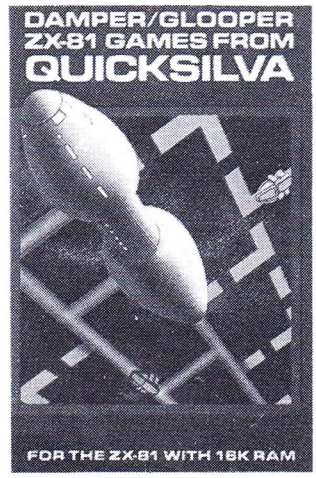
If your club does not appear here then please drop us a line to:-

CLUB PAGE
COMPUTER INPUT
P.O. BOX 39-278
AUCKLAND WEST

QUICKSILVA







ALL $24.95

Alpine Computing Ltd.

P.O. Box 33-865 TAKAPUNA

Mail Order SOFTWARE

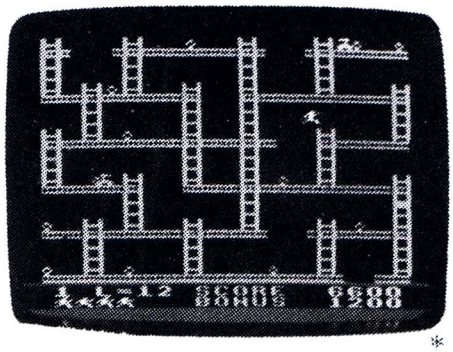
RICHLEY Industries Ltd

P.O. BOX 7259, WELLESLEY ST., AUCKLAND.

JUMPMAN

The ALIENATORS have infiltrated JUPITER headquarters and planted bombs throughout its thirty levels. Only by scaling the many ladders, girders and perilous ropes that provide access to the hidden interiors and mystery mazes of Headquarters, can you reach every bomb. As JUMPMAN, you must fight off the Alienators' bullets, robots, dragons, birdmen, flying saucers and other demonic destroyers. Even if you escape the clutches of these villainous fiends, beware of crumbling girders and vanishing escape routes.

Should you avoid the Alientator, climb to the top and try to work your way down, or try to hurdle him and defuse the bombs closest to you before they go off? The choice is yours. But be careful, you may mistime your jump and find yourself dangling from a ledge with your seven lives a mere memory.



ONLY $55.00

CASSETTE only 20 left

RICHLEY Ind. Ltd

How to order

Simply fill in the relevant sections on the order form Note that there is no postage or packing to pay on purchases. Please allow 28 days for delivery.

SPECIAL OFFER

Members special discount prices.

*I enclose a cheque/postal order

*Please charge to my Visa/Bankcard Expiry Date.....
*Delete/complete as applicable

Signature

Mr/Mrs/Miss

Address

(Please print)

WHATEVER YOUR TASTE...

WHAT GOOD IS THE LATEST TECHNOLOGY IF YOU CAN'T AFFORD IT?

Congo Bongo

Champion Tennis

Monaco GP

Music

BUT NOW, AT ONLY

$399

YOU CAN.

Because the Sega SC 3000 is a computer, not just a video games machine, its other diverse uses include being an invaluable educational tool. A means of creative expression. Even an indispensible financial organiser.

Imagine how much more readily children will study their school subjects with the help of the SC 3000. Or how inspired any enthusiastic artist will be by the musical and 16 colour, graphic cartridges available.

And your Sega SC 3000 can grow with your family's changing needs. Joystick, printer and cassette deck are just some of its many low-cost expansion capabilities.

Seeing is believing, so don't buy a home computer without seeing the Sega SC 3000 first. You'll be convinced that you need look no further.

The best technology at the best price. That's the Sega promise. So, if you want to know what state-of-the-art really means, familiarize yourself with the new standards of performance set by Sega.

The latest Sega SC 3000 will keep the family entertained for hours with its vast selection of arcade games. Enjoy the challenge of these thrilling games, recreated on your own TV screen with colourful, high-definition, quality graphics.

The streamlined keyboard ensures the easiest operating ever for those itchy trigger fingers. And if all the famous arcade games aren't hard enough, you can even programme your own.

GRANDSTAND

SEGA®

HOME COMPUTERS.

SPECIFICATIONS
— 32 independent sprites
— 48K expandable memory
— 16K video ram
— screen text 38 x 24

THE BRAINS OF THE FAMILY.

SUBSCRIBERS PAGE

10% DISCOUNT FOR SUBSCRIBERS

Your choice of the "FREE GAME" with all orders $100 and over (and multiples thereof).

Special Discount for Subscribers

As you are probably aware subscribers are offered a 10% discount off any mail order item. Also if you are having trouble purchasing any hardware or software contact us and we will get what you need (+ 10% discount), for this service to you. Subscribers will recieve a subscription number in the post.

When you send your order to us make sure you quote your sub number or if you have not recieved your number send in your name and address and if possible when you became a subscriber.

FREE GAMES

With orders $100 and over.

"SPOT THE OBJECT!"

This has been rather hard for you as we have recieved no entries that have been correct. So this time we'll give you a few clues.

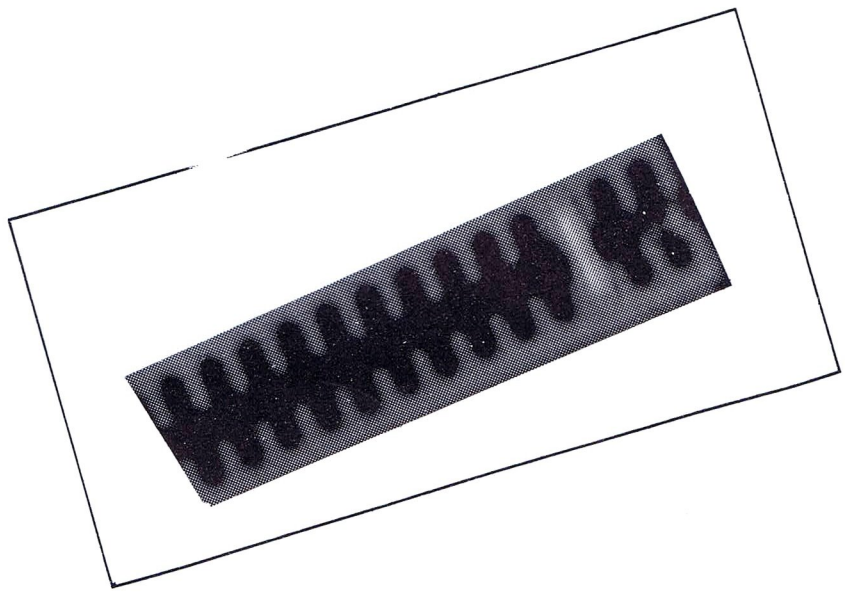
1. used for the ZX81
2. its not part of the computer itself.

Thats just about given it away. Here it is again:
All you have to do is idenfity what it is and send you answer into

Subscribers Competition
FREE POST 671
P.O. BOX 30 002
TAKAPUNA NORTH

We will keep this competition open until a winner has claimed the prize which is a Computer Input Tee Shirt.

So send in your chest size as well.



PROGRAM OF THE YEAR

Of the programs published for the past 7 months we have been selecting the program of the month, for the Program of the year Competion.

Each program will be judged on graphics, sound, setting out level of difficulty etc. (The computer used will be taken into account).

The prize will be a DICK SMITH 'CAT' for christmas.

The **"program of the month"** this month goes to Richard Haggart of Auckland for his program **Labyrinth** on the Spectrum Computer.

The "program of the year" entries so far are:

Peter McCarrol - Lower Hutt - Nov 1983
Pat Poland - TE AKAU - Dec 1983
Paul Bonnington - Palmerston North - Feb 1984
David Parrott - Rotorua - March 1984
Derek Richards - Papakura - April 1984
David Palmer - Rotorua - May 1984
John Perry - Auckland - June/July 1984
Richard Haggart - Auckland - August 1984

NEXT MONTH

Next month is our Anniversary issue! Yes, we are now 1 year old! We overview the ATARI 600XL, is it what it's cracked up to be!

We also carry on our regular features - on the Sega, Z80 machine code and color genie plus articles for the C64, VR100, the Cat, VZ200 and spectravideo. We feature two great games - 'Magic Mansion' for the 16K ZX81 by David Gilbert and 'LUNAR' for the Sega by William Lau.

This is going to be our best one yet! Don't miss it!

ADVERTISERS INDEX

ALPINE COMPUTING LTD	46
A.N.Z. BOOKS	31
COMMODORE COMPUTER (NZ) LTD	1
COMPUTER GAMES RENTALS	42
DAVID REID	IFC
DICK SMITH ELECTRONICS LTD	12
EINSTEIN SCIENTIFIC LTD	28
EXCELSIOR SUPPLY COMPANY LTD	24
GRANDSTAND LEISURE (NZ) LTD	OBC
HARRIS ELECTRONICS	44
HI-TECH PROGRAMMING	16
MANUKAU COMPUTERS	42
MICRO SOFTWARECLUB	16
NEBULA SOFTWARE	29
N.Z TYPEWRITERS	16
RICKLEY INDUSTRIES LTD	IBC 2 42
SATELITE SOFTWARE	13 27
THE COMPUTER TERMINAL	8
TIMEGATE SOFTWARE	33
UNIVERSITY BOOK SHOP	30
WEST CITY COMPUTER CENTRE	30