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Sharp 700 Series
Software Reviews
Commodore 64
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Listings
Competitions
Mail Order Software
Details inside
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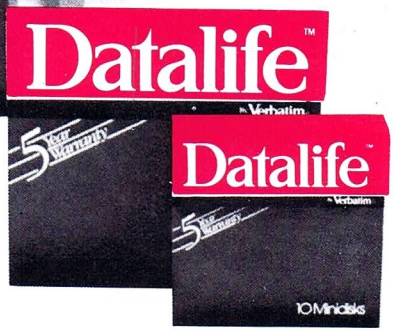

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ARTICLES

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).

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COMPUTER INPUT

NEW ZEALAND'S HOME COMPUTING MAGAZINE

"SEE YOU AT THE SHOW"

That's our catch cry this month. On June 16th, the Microcomputer Club of NZ is having its annual Computer Show in Auckland at the Showgrounds. COMPUTER INPUT will be there as well as supplies of hardware, peripherals and software. As well as displaying our illustrious magazine, we will also be selling T-shirts, products from our mail order and best of all we will be running competitions with great prizes of new software for the computer of you choice, PLUS free subscriptions to lucky winners.

We will also be launching our new magazine

PROGRAM INPUT

printed in the same quality format as this publication.

We are having difficulty giving away the VZ200 in our competition on SPOT THE DELIBERATE ERROR. Perhaps we are being too tricky!! I'll give you a clue — It's not in the program listings, the Mail Order or, heaven forbid, the Editorial. If we have a winner in time for the show, we can have the winner brought to the show for a big presentation.

SOFTWARE REVIEW

This month's software review is on Commodore 64 software. So many good new games are being marketed that we have made them a feature this time. Next month, BBC, SPectrum and the new Acorn Electron software.

HARDWARE REVIEW

We look at the new Sharp MZ721, a new entry into 64K RAM race, with built-in data cassette and optional printer. it will be interesting to see how it shapes up along side the more established brands.

So, once again, read on, good luck with the competition and SEE YOU AT THE SHOW. I'll be the one wearing the COMPUTER INPUT T-shirt. (I hope it's not too cold!).

ED.

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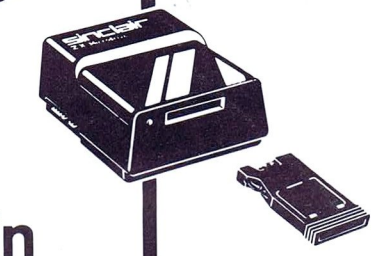

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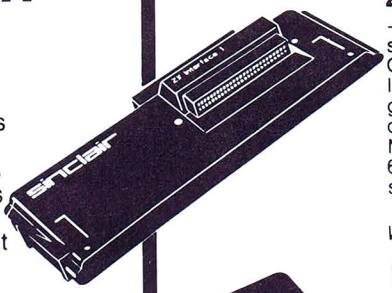

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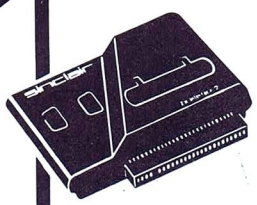

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QL SOFTWARE SUITE ANNOUNCED

Each Sinclair QL is supplied complete with a powerful immediately useful and integrated software system with applications programs and full supporting documentation.

Equally valuable in the home or office the suite contains *QL Abacus* for spreadsheet analysis, *Archive* for database management, *Easel* for graphics and *Quill* for wordprocessing.

Written by, and licensed from, Psion the fully-interactive packages are based on the concepts of 'Inform and Decide', 'Do and See' and 'What You See is What You Get' (WYSIWYG).

Psion's managing director, David Potter, said that "the fundamental quality of the software – which has taken 18 months to develop – is its useability. Each program is more powerful and functional than the existing products for desk-top computers costing up to £5000.

Yet it is designed to be used with no prior training or computer knowledge. The software understands the user rather than the user having to understand the software.

All four programs incorporate state-of-the-art developments in each subject area, share a common style and have been designed, above all, for ease-of-use. With direct entry available to the most regularly required features every owner can be operational at a basic but useful level within a few moments.

Thereafter as his experience grows he can move through each program's pyramidal structure progressively taking control of more sophisticated functions.

Eliminating the delays of batch-processing, most results are displayed immediately, in real-time, and in the same format as they will be printed.

Throughout operation full information is displayed on current status and command availability. HELP is always available – even during input – and, after consultation, will return the user to exactly the same place in the original work.

As an invaluable aid to say, report writing or planning development, data can be transferred from program to program within the suite using IMPORT and EXPORT commands, and modified at the destination point before return.

An important and innovative new service to users is the Sinclair QL Users Bureau (QLUB) which will automatically supply software updates free to members. In addition Psion will provide written response to technical queries on software. QLUB will also mail six free newsletters each year containing technical tips, applications suggestions and latest news on Sinclair QL hardware, software and peripherals. Membership is £35 per year.

SINCLAIR RESEARCH LIMITED – BACKGROUND INFORMATION

Sinclair Research was founded by its chairman, Sir Clive Sinclair in July 1979, to conceive, develop and market new consumer electronics products.

In four years the company has established itself as a world-leader in the personal computer market with total sales in excess of 2,300,000 units and monthly production of over 100,000 units. Recently it entered a second major market area by launching its flat-screen pocket TV.

Sinclair Research is 85% owned by Sir Clive and a further 10% is held by a group of institutional investors who in February 1983 subscribed £13.6 million gross by private placement – capitalising the company at £135.9 million.

Company turnover doubled to £54.53 (£27.17) million in the year to March 1983 while profits before taxation and exceptional item were £14.03 (£8.55) million.

Sinclair Research concentrates itself on R & D and marketing and subcontrcts all production. Current Sinclair Research projects include a new range of personal computers, computer peripherals, flat-screen TV developments and consumer applications of solid state technology.

Based in Cambridge, Sinclair Research has branch offices in London and Boston USA, and additional research laboratories in Winchester and St Ives, Cambs.

Eric's Answers

Dear Eric,

Could you please give me some information concerning printers for my VIC20. I would like one in the future for school work, word processing, letters, graphical art, recording events and data, etc. I don't know much about printers, so some advice on a relatively cheap one to suit my needs would be appreciated. Also could you give me some advice on word processor-type software available for the VIC20?

Daniel Travers
WAIHI BEACH

Daniel,

1 Small Dot Matric printers are available for the VIC20 from about $750 upwards. Some require special interfaces, unfortunately, which would make them dear. Perhaps someone could tell us how to interface a ZX printer???? and judging by your nougts and crosses program in our February issue, I can see why you need one. Also with reference to the C-64 typewriter program on Page 30 of our March issue, this program by John Algar could simply be converted to the VIC by changing the pokes (which only control the colour of the border and screen) and checking the TAB and SPC commands with those of the VIC-20.
2 We are creating a NEW column on Basic which will help readers less informed on Basic programing.
3 What a good idea. I will have to put the pressure on our advertisers for an update on their available products, in this country and of course the current prices.

ERIC

Dear Eric,

Do you know of any company or agency which sells or is going to stock the "Mattel" Aquarius computer?

David J. Eke
DARGAVILLE

David,

It is my understanding that the Mattel Aquarius is to be handled by Fountain Marketing Ltd. As far back as December last year, I had discussions with regards to reviewing the Aquarius in our illustrious mag.

ED.

Dear Eric,

Since some of my programs seem to develop to monumental proportions, I would like to know if there is any simple method of checking how much memory has been used or how much memory is left?

Mrs P. A. Hopkins
PAEKAKARIKI

Mrs Hopkins,

THANK YOU. The only way I know of checking remaining memory is to ??? ??????????????????????????????????? ??????????????????????????????????? ??????????????????????????????????? ??????????????????????, but perhaps once again an astute reader could help.

ED.

Dear Eric,

In order to speed up programs written in Basic on the SEGA, is it possible to disable the keyboard scan and TIME$ update interrupts, thereby reducing programing time? Is there any way of saving data on cassette other than loading it as data statements in a program, i.e. is it possible to maintain updateable data files? I am, of course, again referring to Basic programing rather than machine coded routines.

Stuart McLachlan
NAPIER

Stuart,

Sega Basic is slow and I would tend to try Machine Code as an easier way of speeding things up. I have put your question to Brian and he will give you a more appropriate answer next issue.

ED.

Dear Eric,

Having recently purchased a SEGA SC-3000 home computer, I re-read your review in the November '83 edition of this fine magazine. At one point in the review, it is written that the operating manual is "extremely comprehensive," whereas, to me, being a relative newcomer to the computer world, I found a lot of omissions. Words like "erase," "not" and "XOR" were not explained enough for my liking and the word "sound" has left me totally confused since I don't really know what it can do and how to get certain sounds.

I would also like to know if the SEGA is backed with software books as well as all other home computers are, and if so, where I can get these books from.

Does the SEGA work of normal Z80 machine code, or does it need a special set of instructions.

I'm not doubting the computer itself, I have found it to be very good, but parts of the manual and the lack of back-up material leaves a lot to be desired.

Coul you please fill me in on these details?

Rodney Fraser
WAINUIOMATA

Rodney,

All will be revealed in our Sega column by Brian, as manual converted from Japanese to English don't always make sense. Also, very shortly we will be publishing a Programers Guide to the Sega. So keep reading COMPUTER INPUT.

ED.

Dear Eric,

I have found a mistake in the Spectrum 48K Space Chase program. It is written for an issue 3 Spectrum which, due to Rom/Ula upgrades by Sinclair is slightly different in some aspects. The most apparent difference is that the "In" command is different on the issues 1 and 2 to the issue 3. If you can't get the program to opperate correctly, here is a conversion list for In results:

ISSUE 3	ISSUES 1&2
191	255
190	254
189	253

and so on.

So this is a mistake that makes the program un-runable on the earlier issue Spectrums.

D. Mackenzie
REMUER

ED. Not quite a Reward, but worth a mention!

Dear Eric,

Could you please tell me if the Dragon 32 microcomputer will be available in NZ, and if so, how much would it cost, and where would it be available from?

I think the Dragon is an excellent micro and I am looking forward to its arrival in NZ.

Chris Caldwell
WANGANUI

Chris,

Software for this machine is available from Alpine Software, and I understand that the Dragon 32 is available from John Gilberts Electronics in Auckland.

ED.

Dear Eric,

A word or three to **our** letters column.

Have any of you ZX81 users come across circuit diagrams for interfacing this great machine?

I require diagrams for I/O ports, RS232 or Centronics interface, programable joysticks, etc. All replies to:

P. R. Boyce
ASHBURTON

Ta very much Ed. Give yourself a big pat on the back from me, for a great mag. (Say HI to the rest of the crew.)

Pete Boyce

Pete,

As far as I can tell, interfacers for the ZX81 to do the tasks that you require would cost more than twice the original cost of the ZX81 with 16K RAM. Everything seems geared towards the Spectrum with Interface 1 and 2 plus microdrives, etc., but, perhaps, a reader could prove me wrong and help you out. Keep those letters coming folks.

ED.

Eric

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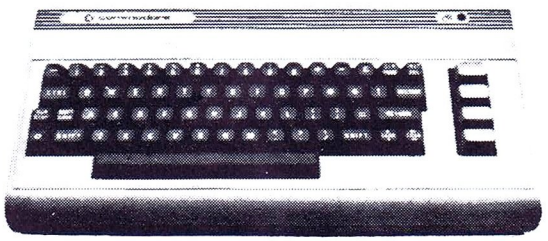

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hardware review

SHARP

MZ721 HOME COMPUTER

by Martin and Faye Hall

The Sharp MZ-700 series is one of the newest series of personal computers to reach the home computer market. The series consists of three models, each model uses the Z-80A (3.5 MHz) microprocessor and has a 64K byte RAM. The MZ-711 is the cheapest of the 3 models and can be considered the basic computer unit. It can be connected to your own data cassette recorder and television set or colour monitor.

The next model in the series, the MZ-721 (review model) has the added feature of a built-in cassette data recorder.

The third model, MZ-731, has both a built-in cassette data recorder and plotter printer (colour). The additional data recorder and plotter printer fit into the basic computer unit with a minimum of fuss making for a very tidy system. The series has been designed in a modular fashion so that later enhancement of the basic computing unit with peripherals is very simple. The Owners' Manual which accompanies the computer shows very clearly how the additional modules may be added.

Overall, to look at, the complete system is very neat, tidy and compact. One unit houses the computer, the data recorder and the plotter printer. There is no messy jungle of cables and cords. The system comes with two leads, the power lead which plugs into a standard 230V socket, and an RF lead to the television set. (Additional leads are required if you are using your own cassette data recorder.) A disappointing feature was that the RF lead supplied was only one metre long. After the computer was connected, to the television, we were sitting only half a metre from the screen and we found this distance impractical if we were playing games, and also very hard on our eyes if we looked at the screen too long. We would suggest that a longer RF lead be obtained.

'Clean' Computer

The Sharp MZ-700 series are "clean computers", to quote the Owners' Manual. This means that when the power is first turned on, the computer's memory is completely blank. At this point, no commands should be entered into the computer as none will be understood, and no programs should be loaded into the computer as you will be unable to run them. (NOTE: Only Machine Code programs can be loaded into the computer whilst the computer is "clean" as these do not require a language interpreter.)

To make the computer operational, a language must be loaded. A basic language cassette tape is included with the purchase of the computer. The contents of this tape must be loaded into the computer each time the power for the computer is switched on or the RESET button at the rear of the computer is pressed. The BASIC interpreter takes 3½ minutes to load from tape and uses a sizeable portion of the 64K bytes of total memory available. After loading the maximum available storage space for the user is reduced to 36K bytes. This operation may seem tiresome, but has been included so that languages other than BASIC can be easily loaded into the computer. We suggest that you look after your BASIC language tape well, as continually replacing it could get expensive.

Owners' Manual

The Owners' manual provided with the system is very good and carefully explains all the concepts of computing for a beginner. It has a handy index of BASIC commands so that more experienced users of the BASIC language can quickly get a reference for command syntax. The manual does lack a comprehensive index, though. It was noted that the manual only deals with BASIC commands, we were not too sure about what information would be available if another language was to be used. The Basic Error Message List was a little hard to find in the manual, but it did provide adequate explanations to help you debug a program if you happen to get an error when running it. The error detecting procedures within the computer were found to be quite sophisticated. A chapter in the Owners' Manual has been dedicated to the hardware of the MZ-700 series. This chapter features diagrams of memory configurations and maps, and also all the circuit diagrams associated with each part of the computer.

Keyboard

The keyboard is set out in the standard QWERTY format, with each key having four functions. The computer can be operated in two modes, alphanumeric mode and graphic mode. In each mode, the SHIFT key is used to obtain the second function of a key. The GRAPH key is used to put the computer in graphics mode. So that the user can see which mode the computer is in, the cursor shows up differently in each mode.

To the right of the alphanumeric keys are a group of four keys which control cursor movement. These keys do not need to be pushed at the same time as another key (this is often the case in other computers) and perform the same function no matter what mode the computer is in.

The INSERT and DELETE keys have also been separated from the main keypad to make editing of programs easier. When the SHIFT is pressed in conjunction with the above two keys the CLEAR screen and HOME functions are obtained (HOME sets the cursor to the top left hand position of the screen.)

Above the main keypad are the five user definable keys. These keys can be set by the user to register 10 frequently-used commands. The 10 commands are accessible by pressing the function key or the SHIFT and function key together. Sets of sticky labels are supplied with the computer so that you can label the function keys with your commands. The function keys are initially set when the BASIC interpreter is loaded to be: RUN, LIST, AUTO, RENUM, COLOR, CHR$, DEF KEY, CONT, SAVE, LOAD. The DEF KEY statement is used to change the function on the key.

The 'CTRL' control key is used with other character keys to obtain special functions such as carriage return, set upper case, set lower case, insert, etc.

The 'BREAK' key when pressed during the running of a program will stop the program running but when it is released will allow the program to continue run-

ning. When the SHIFT and BREAK are pressed together the program running is interrupted and will no longer run when the keys are released.

When the spacebar is pressed, a space is entered regardless of the computer mode. The spacebar can also be used to pause a program that is being listed. The program listing will not scroll until the spacebar is released.

Editing Features

The editing features available on this computer are very comprehensive. Many of the aids used in editing have already been mentioned in the keyboard discussion. A few of the special editing features included are: automatic line numbering (AUTO command), deleting of specific lines or a group of lines in a program (DELETE command), renumbering the whole program (RENUM command), and a command to merge two files, i.e. a program which is read from cassette into memory is added onto the end of a program already in memory (MERGE command). Another special feature of the NZ-700 series is that all of the commands, instructions and statements (eg Print, if—then, Music) can be abbreviated to at the most two letters and a full stop. This saves a bit of time when a long program has to be entered into the computer.

Sound

The Sharp MZ-700 has its own built-in sound generator with an external volume control. The system has a 3 octave note range and this includes all the sharps and flats inbetween. There are 9 different note durations available and the tempo of your composition can be held using the TEMPO statement. Programing music is very simple — all you have to do is put the notes and their duration that you wish to hear into a string and then play them using the MUSIC statement.

Graphics

Graphic techniques available on the MZ-700 are very good and give the user a lot of freedom to design, display and plot the images created. Two very useful statements available in graphics mode are the LINE statements, which when executed draws lines between specified screen coordinated and the CIRCLE command, which draws a circle of specified radius at a specified position on the screen.

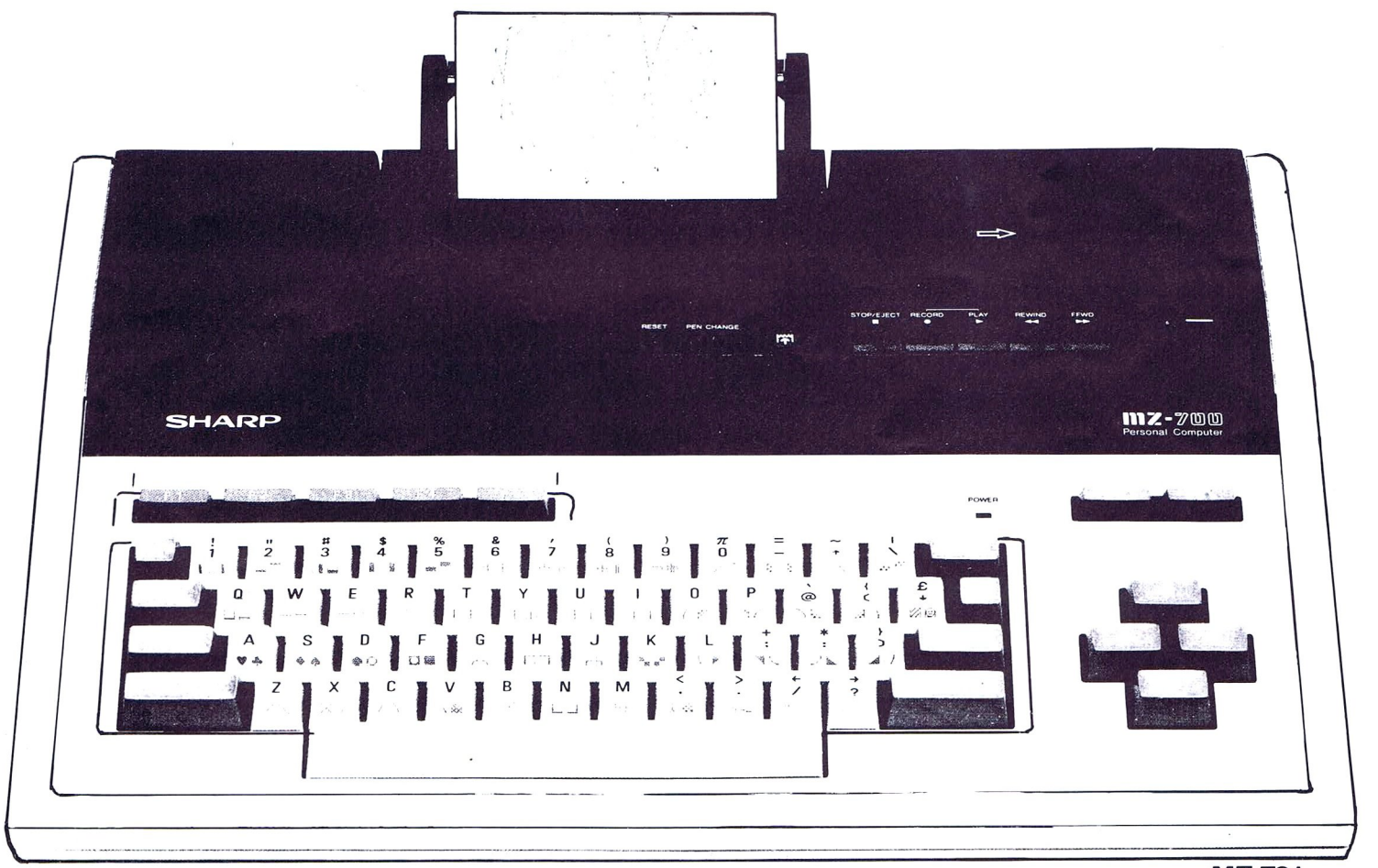
There are eight different colours available for both background and foreground colours. They are: Black, Blue, Red, Purple, Green, Light Blue, Yellow, and White. The COLOR statement is used to change the colour. A very useful parameter in this statement is the ability to change to colour of a specific point on the screen whilst maintaining the screen colour around it. In the graphics mode, the display is 80 by 50 pixels whilst in the text (alpha) mode it is 40 characters by 25 lines.

Software Availability

At present there are some 40 software packages available for the MZ-700 series. The range is from games and educational software to aids for the small business, which include order tracking programs, and budgeting programs.

Summary

The Sharp MZ-700 series of computers are very compact, yet extremely versatile. They have been designed to cater for a wide range of applications. Their overall design has been made with the user in mind, making learning easy for the beginner, whilst not boring the more experienced user. The special editing and graphical features make this system very comprehensive and good competition for more expensive computers. Priced at $995 for the basic computer unit with the built-in data recorder (MZ-721) this computer is well worth a look. With future enhancements of twin disc drives and joysticks, this computer system can only be more appealing.



MZ-731

Specifications MZ-700 Series

CPU	Z-80A
ROM	Monitor 4K-byte Character generator: 2K-byte
RAM	Program: 64K-byte V-RAM: 4K-byte
Keys	ASCII keyboard Cursor control key Definable function key INS, DEL keys
Display	Screen construction: 40 characters x 25 lines Graphics: 80 x 50 dots (8 colours) Home TV (PAL system) or special monitor TV is used. ● Built-in RF modulator for the use of home colour TV ● RGB terminal ● Composite terminal
Interface	Built-in printer interface and cassette interface
Speaker (Built-in)	Maximum output power: 500 mW
Clock function	Built in
Power source	AC: local voltage, 50/60 Hz
Power consumption	Approx. 20W
Temperature	Operating: 0°-35°C (32°-95°F) Storage: −20°-60°C (−4°-140°F)
Humidity	Service humidity: 85% or less (RM)
Dimensions	MZ-731: 440(W) x 305(D) x 102(H)mm MZ-721: 440(W) x 305 (D) x 86 (H)mm MZ-711: 440(W) x 305 (D) x 86 (H)mm
Weight	MZ-731: 4.6kg MZ-721: 4.0kg MZ-711: 3.6kg

Data Recorder (MZ-1T01)

Tape	Standard audio cassette tape
Data transfer (Sharp PW M system)	1200 bit/sec.

Colour Plotter Printer (MZ-1P01)

Colour	Black, Blue, Red and Green
Printing digits	80, 40 or 26 per line

SECRET MESSAGE FOR COLOUR GENIE

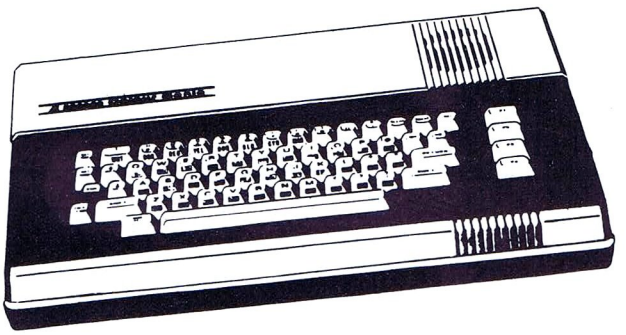
BY GEOFF JENKINS, WAIHI

One command that intrigued me on the Colour Genie was the VARPTR. After playing around with it for an hour or two I came up with this little program that allows a simple program to be included at the end of a BASIC program which you cannot DELETE, EDIT or LIST without some difficulty.

The secret of the program, is to use illegal line numbers. The AUTO line numbering allows lines up to and including line 65527 to be used. Lines 65528 and 65529 can be used manually, but use of 65530 to 65535 the theoretical limit, results in an SN error. These are illegal line numbers. Although not obvious to the average computerist, BASIC does not care about line numbering unless a line number is specified in a direct (LIST, RUN, EDIT, etc.) or a program (GOTO, GOSUB, etc.) command. It will plod through each line in turn until it is told otherwise. A simple program with no branches can have all line numbers the same (Note 1) or even in reverse order (Note 2). BASIC will not branch to an illegal line number, nor will it find a line number "hidden" by a higher line number used before it. When it gets to a line number greater than the line required, it aborts its search

So where does VARPTR come in? By placing a DATA line just below the block of program to be moved and using a READ statement, VARPTR (names) returns the address of three bytes of information concerning names. The first byte contains the length of string and the second and third bytes contain the starting address the string is stored at in the memory – in Lo Hi order. This is a very convenient and quick way to find this address which is actually the memory location of the DATA string in the program. It is right to assume that the program block is located between this address and top-of-memory. (32768 in 32K Genie).

Lines are stored in the following format by BASIC. Line number Lo byte, line number Hi byte, two byte link address, program line in ASCII and BASIC tokens, 00 byte. By using line numbers above 65280, the line number Hi byte will be 255 and since the link addresses only go to 32K, the only other way for a 255 to be in the memory is to use the last graphics character on page 122 of the manual – one to avoid. Between the program block and top-of-memory in an area of unused RAM of unknown random content so to avoid running into this area I have chosen to count off the lines as they are altered. (There are other ways).



All that is left to do is find these Hi bytes and POKE a new Lo byte of 251 to 255 at the address below them. This byte can be the same for every line as explained earlier but no calls can be made to this illegal line number from within or outside the secret program.

To call it from legal line numbers use a GOTO or GOSUB to a dummy line with a legal number at say 65500. Use a REM line.

The secret program can contain INPUT statements and can branch to any legal line number in the regular BASIC program it is used with. It could contain DATA statements for games like Hangman, a copyright message or the decoding program for other DATA used by a program. Use your immagination!

Finally, the quick person may have noticed that line 65530 (Lo byte 250) has been excluded in this discussion. This line is illegal but can be listed. It can't be DELETED directly but if it casuses an SN error when BASIC runs into it, the resulting EDIT mode can be used to alter or delete it. If it is a normal BASIC line or has a REM or END statment at the start it will be "safe" alone with any other lines of the same line number that follow.

Listing 1 – An example of the use of line 65530.

```
65530 END:      * * * * * * * * *
65530 :         * -PROGRAM  BY- *
65530 :         * GEOFF JENKINS *
65530 :         * WAIHI  JAN 84 *
65530 :         * * * * * * * * *
```

Notice the use of a colon to set BASIC to insert leading spaces in the lines.

Listing 2

```
1000 INPUT "NUMBER OF LINES TO MOVE ";N
1010 READ A$: V=VARPTR(A$)
1020 S=PEEK(V+1)+256*(PEEK(V+2))
1030 FOR A=S TO 32768
1040 IF PEEK(A)=255 THEN POKEA-1,252:N=N-1
1050 IF N>0 THEN NEXT ELSE END

64000 DATA A$
65285 CLS
65290 FOR A=1 TO 10
65295 PRINT@325,"THIS IS A SECRET MESSAGE"
65300 FOR T=1 TO 200 : NEXT
65305 CLS
65310 FOR T=1 TO 200 : NEXT
65315 NEXT : GOTO 100
```

Listing 3

```
10 GOTO 65500
100 PRINT "HOW WAS THAT!"
110 END
65500 REM
```

GENIE INPUT

To use the program in Listing 2
1 Enter secret program above line 65280
2 Test the program before moving it
3 Enter a DATA line at 65280 or lower
4 Enter the "move" program somewhere convenient
5 RUN the "move" program
6 DELETE 1000-64000
7 Enter Listing 3 and RUN it.

Note 1: In line 1040, POKEA-1, 0
Note 2: In line 1040, POKE A-1, N

Finally, further Genie Input

New owners of Colour Genie's are probably having trouble finding their way round the EG2000 BASIC Manual. I have prepared a contents and index page which fits inside the back cover and will supply these in return for your name and address and $1. Geoff Jenkins, 10 Smith Street, Waihi.

Colour Genie Scrapbook

Here are a few miscellaneous tips on the Colour Genie.

1 Holding down the shift key or having shift lock on, and pressing @, will stop a program listing or stop a program running. This is useful when you want to freeze a program to see what is happening. Pressing any other key will start it going again.
2 Holding down the repeat key while a program is running or while doing a listing will slow down the process.
3 If you are using the line editor to change a program line, you can put backspace characters into a line by pressing C then left arrow. This is either wonderful because you can put them into a comment on the end of a line to hide what was there before, or a curse, because you do it accidentally and the line looks OK, but you get a syntax error and you can't tell what is wrong. Also try pressing C then the function keys for some characters that you might not have seen before.
4 Try redefining programable graphics characters while you are displaying the character on the screen. This is a good way of introducing movement to your programable graphics characters. Also try switching character sets (using the CHAR instruction) while you are displaying graphics characters.
5 You can get some very strange effects with the OUT command. Try OUT 255,x where x is a number between 0 and 255. This command is used to send a value to an output port. Port number 255 controls many of the screen functions as well as the RS-232 and cassette interfaces. The effects that you get when you do this are caused by this control of the screen functions.

If you have any problems whatsover or any technical enquiries about the Colour Genie then we will be happy to hear from you. Send all enquiries to:

Genie Input,
Freepost 671,
P.O. Box 39-278,
Auckland West.

and remember — no stamps needed!!

VIC 20 INPUT

Here is a tip for VIC-20 owners which actually allows you to control the speed of your program. It comes in handy in games, etc. when different skill levels are required. It can also be used to speed up old forgotten programs to make them more enjoyable to play, etc.

To gain this added speed (or to slow down a program) simply POKE the location 37879 with a number between 0 and 255.

RANGE: 0-128 slow to average speed
128-255 fast to very fast

When music is to be played, however, the computer must be returned to its normal speed or the music won't sound like music. This is achieved by:

POKE 37879,78

and after the music has played we POKE 37879 back with the required speed.

Another thing to note is the speed of the cursor. If we speed up the program to its fullest extent by poking 37879 with 255, the cursor will slow right down. If we poke 37879,1 the program will slow right down but the cursor will speed up. (To return cursor to normal speed type RUN/STOP and RESTORE.)

Although changing the speed of the program has its advantages, e.g. making a game harder as the player's skill improves we must also remember that by changing the speed of the VIC the time clock is no longer real time so you must decide whether you want speed or a "time-keeper."

M. Vickers
AUCKLAND

Enclosed is a short routine for the unexpanded VIC-20 to bring back a newed program.

First the newed program must have a REM at the very beginning of the program. Then once you new it, you can get it back by POKE4097,7:POKE4098,16 and you should have your program back.

```
10 rem
20 print"test"
NEW
POKE4097,7:POKE4098,16
```

John Osborne
AUCKLAND

SEGA INPUT

The SEGA Cassette Routines

78EF Load Filename.
7982 Load program bytes.
The following program illustrates the loading of the program using machine code, and instead of writing the bytes to memory, writes them to the video screen.

7A59 Save Filename
7AB9 Save sync bytes
7AD2 Save bytes to tape
Other locations used for the cassette routines.

82A3 10 locations hold the filename being saved (16 character).
82A2 Filename found flag, if zero then load the next program, else skip it.
83A3 Holds the filename of the program being loaded.
3A03 Small delay.
3A0F Write sync bytes to tape.
3A12
7B07 Write byte to tape.

Making Programs Auto Run After Loading

This is easier than it sounds. The trick is to poke a small machine code routine into memory, this routine loads the program, then calls &H6C37 which runs the program. A basic program to do this is as follows:

More About Writing Text Using Machine Code

In a previous article it was shown that loading the HL register to point to the text string, etc, then calling &H2400. A better method is:

LD HL, Text string address
CALL &H4A6F
RET

This will print all of the text string to the screen at the current cursor position, and return upon finding &H0D at the end of the text string.

Altering the Cursor Position Using Machine Code

The computer writes to video RAM using an auto-incrementing address register located within the VDP chip. This register is set up using two bytes, and then when data is sent to the register it writes it to video RAM, and increments the address ready for the next byte. The address is sent to the VDP chip (port &HBF) while data is written or read from port &HBE. A Basic program to illustrate this follows:

This program is as stated;

A000 Disable interrupts
A001 Call 2C51; Read status register.
A004 Ld HL with the address you want.
A007 Call 2C44; Output address to register.
A00A Ld A with byte to be written.
A00C Call 2C3D; Write byte to address.
A00F Return.

HL values in the range 0000 to 17FF is the graphics screen, while values of 3C00 to 3FBF is the text screen. It must be noted, however, that interrupts must be disabled, and the status register must be read before you write to the VDP, else the VDP can think that you are writing data and not an address into a register with the VDP.

WRITING BYTES TO THE VIDEO

```
5 SCREEN 1,1:CLS:PRINT"LOADING"
10 FOR X= &HA000 TO &HA022
20 READ A: POKE X,A: NEXT X
30 CALL &HA000 : STOP
40 DATA &HF3,&HCD,&H00,&H3A,&HCD,&H06
50 DATA &H3A,&HFE,&H17,&H20,&HF5,&H2A
60 DATA &H60,&H81,&H06,&H00,&HCD,&H0A
70 DATA &H7A,&HD3,&HBE,&H3E,&H3F,&HC4
80 DATA &H48,&H24,&H23,&H1B,&H7A,&HB3
90 DATA &H20,&HF0,&HC3,&HA9,&H79
```

BASIC LOADER AND AUTO-RUN

```
10 SCREEN 1,1:CLS
20 FOR X = &HF000 TO &HF005
30 READ A: POKE X,A: NEXT X
40 POKE &H82A2,0: PRINT "Press PLAY to
 load program"
50 CALL &HF000: STOP
60 DATA &HCD,&HD5,&H78,&HCD,&H37,&H6C
```

ALTERING CURSOR USING ML

```
10 SCREEN 1,1:CLS
15 FOR X=&HA000 TO &HA00F
20 READ A: POKE X,A: NEXT X
30 FOR Y=&H30 TO &H80: POKE &HA00B,Y
40 CALL &HA000: FOR DE=1 TO 50: NEXT
45 NEXT Y
50 GOTO 50
60 DATA &HF3,&HCD,&H51,&H2C,&H21,&H10
70 DATA &H3C,&HCD,&H44,&H2C,&H3E,&H38
80 DATA &HCD,&H3D,&H2C,&HC9
```

ALTERING CURSOR POS PROG 2

```
10 SCREEN 1,1:CLS:Y=&H30
20 FOR X=&HA000 TO &HA00F
30 READ A: POKE X,A: NEXT X
40 FOR ST=&H10 TO &HDE
50 POKE &HA005,ST
60 Y=Y+1: POKE &HA00B,Y
70 CALL &HA000
80 NEXT ST
90 CURSOR 10,10:STOP
100 DATA &HF3,&HCD,&H51,&H2C,&H21,&H10
110 DATA &H3C,&HCD,&H44,&H2C,&H3E,&H38
120 DATA &HCD,&H3D,&H2C,&HC9
```

Same program but updates the address and writes to next location, etc.
NOTE: All printing is done by machine code located at &HA000.

A Table of Useful ROM/RAM Addresses

10C0-17BF	Character table for VDP.
17C0-19FF	Basic keywords. (1FAE,F6)
1A20-1A82	Jump tables.
1CB1-	FRE routine.
1FAC-	Keyword/token fetch.
2310 (1A29)	Get next character.
2400-245F	Jump tables.
2B52 (2400)	Print char in A,B times.
2B80-2B03	Jump tables.
2C2A (2BCE)	READ DATA VRAM. IN A, BE RET.
2C32 (2BCB)	OUTPUT ADDRESS TO VDPREG Set up register for reading.
2C3D (2BC8)	WRITE DATA VRAM. Out (BE),A RET
2C44 (2BC5)	OUTPUT ADDRESS TO BDPREG. Set up register for writing.
2C51 (2BC2)	READ STATUS REG. IN A, (BF) RET.
359B (2B89)	&H Decode
3604 (2B86)	Hex conversion routine.
39D0-3A12	Jump tables.
3A15 (3A12)	Write byte to tape.
3A4D (3A0F)	Write sync bytes to tape.
3AC3 (3A03)	Delay using BC.
3FA0-411F	Keyboard characters arranged in rows.
4120-4258	Basic keyboard symbols.
4A6F-	Print text string pointed to by HL.
6800 (6847)	Reset.
6803 (6978)	Restart 38H.
6806 (6E48)	NMI routine.
6AB5-	PRINT FRE routine.
6C37-	RUN routine.
73B7-73E4	Print ERROR messages.
73E8-7676	Basic ERROR messages.
779F?	VERIFY routine.
77BB?	VERIFY routine.
77F7	SKIP routine.
7822	FOUND routine.
7850	VERIFY END routine.
788F-789E	VERIFY ERROR routine.
78EF-	Load Filename.
78D5-	LOAD START rotine.
792B-	LOAD SKIP routine.
7956-	LOAD FOUND routine.
7982-	Load program.
79AA-	LOADING END routine.
79E9-	TAPE READ ERROR routine.
7A40-	SAVE START routine.
7A59-	Write Filename.
7AED-	SAVE END routine.
7B07-	Write byte to tape.
8160-8161	Start basic pointer.
8162-8163	End basic pointer.
8164-8165	String storage pointer.
8166-8167	Top of string storage difference between next is free space.
8168-8169	Top of memory pointer.
82A2	Prog found flag, 0=found.
92A3 (+16)	Filename being loaded.
83A3 (+16)	Filename being saved.
9336	Screen control byte. (6DF1, 72B8)
9339	Colour text screen byte.
933A	Colour graph screen byte. (7C9D, 7CA3)
9411	Top range of CURSOR.
9412	Bottom range of CURSOR.
9484	CURS control,0,2=graph.
9485	CURS control,0,1=l/case.
9486	CURS control,0,1=no beep. (69E8)
948E	TIME$ seconds.
948F	TIME$ minutes.
9490	TIME$ hours.

STOP PRESS !

ATARI 800XL $895
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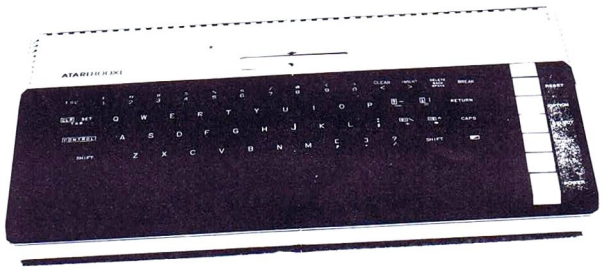
ATARI 1027 PRINTER $795



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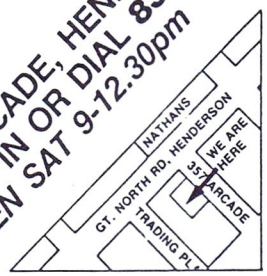

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Getting Started with Graphics

Patricia Hopkins

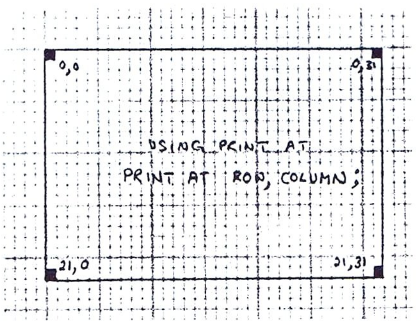
Having experimented for some time with low-resolution monochrome graphics capabilities of my Sinclair ZX81, I have come to the conclusion that some very effective graphics statements are possible.

All programs, whether education, business, domestic, or games, are enhanced by the use of good graphics and a well-thought out layout.

I like to start my programs with an eye-catching title. I feel this is particularly important when working with young children. A title that attracts attention will focus the concentration on the program that follows.

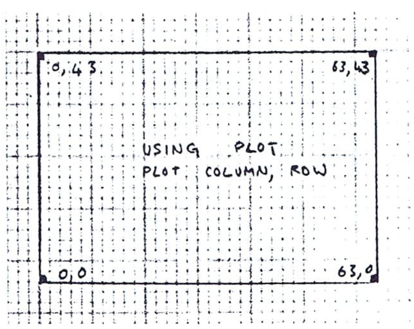
It is a simple matter to draw a screen layout on a sheet of graph paper. First mark out the exact number of pixels on the screen; mine is 64*44. Also mark centre points on each side of and the centre of the screen.

Now decide what design lettering is to be used and rough it out in pencil. When you are satisfied with the design fill in the chosen area with ink and rub out surplus pencil work.



If you are using "PRINT" positions lightly rule in every second line in a different colour and number the "PRINT" positions starting from the top left hand corner 0,0.

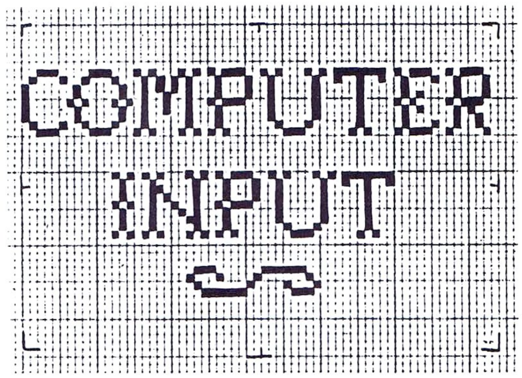
If you are using "PLOT" positions number the positions from the bottom left hand corner 0,0.



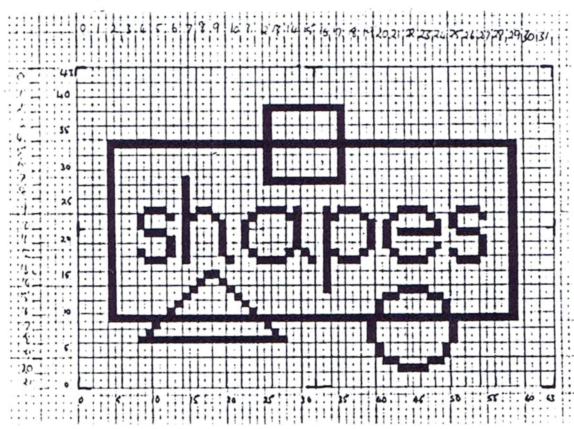
There are several programing techniques that can be used to transfer the design from paper to screen. Possibly the easiest to use is the "ARRAY". The ZX81 has superb array handling capabilities. Straightforward designs such as "CITY" or "COMPUTER INPUT" can be typed in as a single array or divided and typed in as two arrays. This may be quicker as things get a bit slow towards the end of a long array. The flashing Christmas Tree in the December issue of Computer Input was two alternating arrays that I found extremely effective.

The "SHAPES" title I handled differently as each shape is drawn separately on the screen using "PLOT" and "PRINT AT" statements.

I have enjoyed working on these programs very much and have learnt a great deal from them.




```
3010 FOR Y=4 TO 58
3020 PLOT Y,33
3030 PLOT Y,9
3040 NEXT Y
3050 FOR X=33 TO 9 STEP -1
3060 PLOT 4,X
3070 PLOT 58,X
3080 NEXT X
3090 FOR Z=25 TO 35
3100 PLOT Z,38
3110 PLOT Z,28
3120 NEXT Z
3130 FOR T=38 TO 28 STEP -1
3140 PLOT 25,T
3150 PLOT 35,T
3160 NEXT T
3170 FOR U=9 TO 26
3180 PLOT U,6
3190 NEXT U
3200 PRINT AT 18,4;"■"
3210 PRINT AT 18,13;"■"
3220 PRINT AT 17,5;"■"
3230 PRINT AT 17,12;"■"
3240 PRINT AT 16,6;"■"
3250 PRINT AT 16,11;"■"
3260 PRINT AT 15,7;"■"
3270 PRINT AT 15,10;"■"
3280 PRINT AT 14,8;"■"
3290 PRINT AT 14,9;"■"
3300 LET J=3
3310 FOR I=0 TO J*12
3320 PLOT 45+J*2*SIN (I/(J*6)*PI
),7+J*2*COS (I/(J*6)*PI)
3330 NEXT I
3340 PRINT AT 7,7;"■"
3350 PRINT AT 8,7;"■"
3360 PRINT AT 9,4;"■■ ■■ ■■ ■ ■"
3370 PRINT AT 10,4;"■ ■■ ■ ■ ■"
3380 PRINT AT 11,4;"■■■ ■ ■ ■"
3390 PRINT AT 12,4;"■ ■■ ■ ■ ■"
3400 PRINT AT 13,4;"■■ ■ ■ ■■ ■"
3410 PRINT AT 14,16;"■"
3420 PRINT AT 15,16;"■"
3430 FOR I=1 TO 50
3440 NEXT I
3450 CLS
3500 RETURN
```



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.

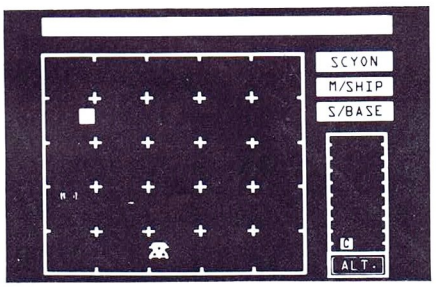
* **Hopeless**
** **Sub-Standard**
*** **What we would expect**
**** **Very Good**
***** **Exceptional**

PROGRAM OF THE MONTH

STAR BATTLE
by Timeworks: C-64 Disc

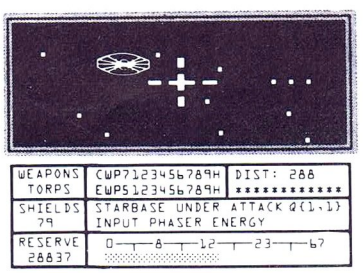
"Strategic Deep Space Combat adventure to save Earth."

It makes you wonder if we will see old age, doesn't it. This game was an advanced form of a game I had played years ago on the ZX81 called Star Trek. This game would be enjoyed by people who enjoy plotting strategy, navigation and using an attack computer to control weapons and the ship as well as just shoot 'em up and knock 'em down game skills.



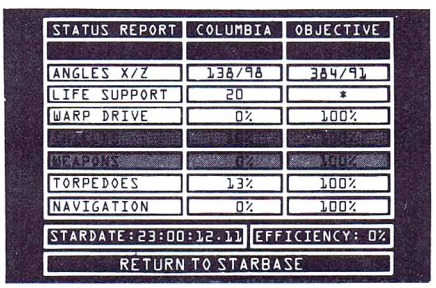
The moving graphics give a good 3-D effect. Game completion time suggests at least 1-3 hours.

The game involves the use of a joystick plus the use of 10 keys on the keyboard of the C-64. An overlay card with keyboard instructions is included in the price.

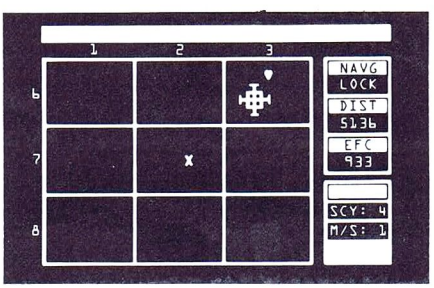


Your ship is able to move around 64 quadrants in a 3-D galaxy with the screen display that of you looking out of the pilot seat into space.

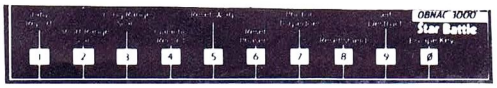
As shown in the inserts, full instrumentation is displayed on the screen, with different screens showing navigation, short-range scans, long-range scans, status reports, galactic record and the attack computer controls. Also a comprehensive 16-page game manual is supplied to help players with their game with easy-to-follow instructions (written in America).



The object is to seek out enemy ships and destroy them. Just like the TV show Star Trek, you set your deflector shields, set your warp speed, set your phase energy levels, prime your torpedoes, plot your navigational course and activate the warp drive to reach your objective. After engaging the enemy Scyons, a damage report is given and you can set a course to land on a Base Star for repairs.



Visual	★★★★
Sound	★★★
Program	★★★★
Difficulty	★★★★
Overall	★★★★



ZX81 16K

3D DEFENDER

3D Defender is an excellent game for the ZX81. Written totally in machine code, the speed is incredible. The 3D effects are flawless, there is a good on-screen introduction and a high score facility.

The game starts off with the player sitting in the cockpit of a Defender craft. As you rise, the landscape moves and if you climb high enough, it disappears off the bottom of the screen. You start with 10 shield points and lose one every time you are shot or collide with an enemy ship. There is a radar at the top of the screen (very helpful), an altitude indicator and a proximity warning indicator (which I find totally useless!). The enemy start attacking one by one. If you fail to shoot the ship as it flies past you, it will land and you lose 50 points. If you manage to hit it you see a spectacular explosion and gain 250 points. Every now and then a bunch of meteors comes flying through and all you can do is dodge them.

Overall this is a very good game, but I do have one bad thing to say about it. Once you have become reasonably good at the program, it takes quite a long time before the game starts getting harder.

I think it is an excellent buy at $16.50.

VISUAL	★★★★★
PROGRAM	★★★★★
DIFFICULTY	★★★
OVERALL	★★★★

David Gilbert
RANGIORA NTH

C-64

WAVY NAVY
by Sirius: Disc

"A raging battle on the high seas, featuring amusing graphics, sound effects and maritime music. Kamikaze fighters, helicopters an Exocet missiles assail you while huge rolling waves force you to continuously change position."

With that kind of build up I could hardly wait for the program to load. Wavy Navy is a new game on the Space Invaders theme. You are in command of a boat which you control by joystick across the screen up and over huge rolling waves. The sky is full of planes and helicopters which you must destroy by firing missiles up at them Every so often, a helicopter peals off and attacks with a burst of machine gun fire (HINT: Shoot the helicopters ASAP).

After a successful run, bonus points are issued and a rating given to the player for each round completed. There are 10 levels of screens, each one getting harder, with ratings from Galley Slave to President. My best was deckhand on level 4.

Visual	★★★★
Sound	★★★
Program	★★★
Difficulty	★★★★
Overall	★★★

CANDY BANDIT
by T&F Software USA: Cassette

This is a good one for the kids, as the following plot suggests:

"So your sweet tooth has gotten out of hand? Well, this time the sherrif is after you and he's no sweetheart. There he is now! Quick! Grab all the candy in sight and dive for the doorway! Don't look now, the doors are rotating... better be good at getting out of sticky situations, 'cause if you hit the wall you're stuck with it! ... etc."

The screen display has 5 horizontal lines across, the same distance apart, with a gap in each which is constantly moving back and forwards. In each sector is displayed toffee apples, lollypops, etc. and you control a little muncher that gobbles them up, moving from section to section through the gaps. Another muncher with a cowboy hat on is the sherrif, and, you guessed it, he's after your mucher!

Visual	★★★
Sound	★★★
Program	★★★
Difficulty	★★★
Overall	★★★

SPECTRUM

TRAX

This is one of the new games from Quicksilva that have finally reached New Zealand. Those of you who are familiar with Gridrunner will be right at home with the basics of the game. The screen is divided up into a grid of squares green in colour with you the "fly" and the computer as the two "spiders." The object is to complete the grid square by square until the screen is complete before the spiders get you. Lots of skill with the keyboard required or else joysticks with Interface 2.

Visual	★★★
Sound	★★★
Program	★★★
Difficulty	★★★
Overall	★★★

3D STRATEGY

The game has full instructions listed on the screen before the rest of the program is run. This is a big help for players who aren't sure as to what's happening. The game instructions intrigued me when they stated that this program would "defeat the most highly-intelligent of humans in a sheer battle of wits." "If your ego can stand the shock of being bested by a small micro in a completely fair challenge." The rules are essentially those of Noughts and Crosses but played in 3 dimensions on a 4 x 4 x 4 cube. To win you must get 4 of your symbols in a straight line (horizontal, verticle or diagonal). With four levels of skill even the most patient, expert, Nought and Crosses player gets beaten. So, let's hear about some high scores.

Visual	★★★
Sound	★★★
Program	★★★★★
Difficulty	★★★★
Overall	★★★★

FRENZY

The basic of this game is a screen showing an outer parameter of red fencing plus individual obstacles internally at random places 1-4 squares long. You have a number of men trying to eliminate you and to retaliate you manoeuvre your man around the squares and obstructions on the screen to put him in a position to shoot at and destroy the groups of men closing in. Once again, having a number of lives helps as skillful hand control is required to be super successful at this game.

Visual	★★★
Sound	★★★
Program	★★★★
Difficulty	★★★
Overall	★★★

ASTRO BLASTER

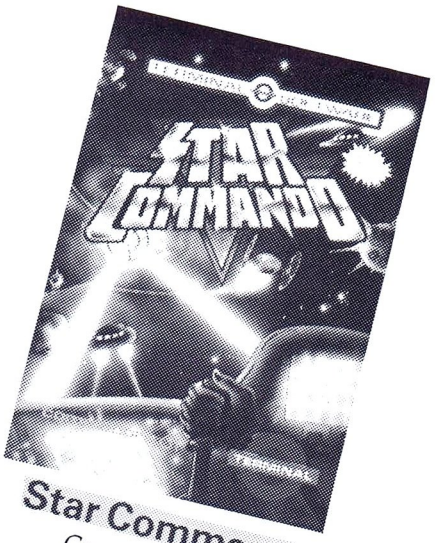
I expected Meteors or Asteroids with the title of Astro Blaster. But instead what appears is a screen with a space ship at the base which fires lasers or missiles up the screen at Space Invader-type meanies with flapping wings which work their way down the screen in great numbers, dropping bombs trying to eliminate you. You have five lives to assist you in avoiding being hit. Lovers of Space Invaders will enjoy this advanced format and pit their skills against the computer. You need to be handy with your keyboard dexterity to master this exciting game.

Visual	★★★★
Sound	★★★
Program	★★★
Difficulty	★★★★
Overall	★★★★

TERMINAL SOFTWARE

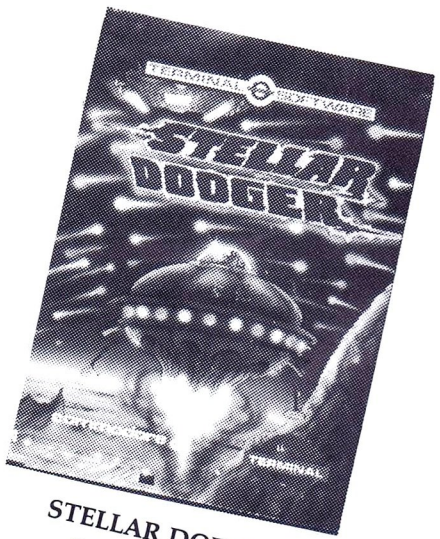
Plumb Crazy
Commodore 64

SUPER DOG FIGHT
Commodore 64



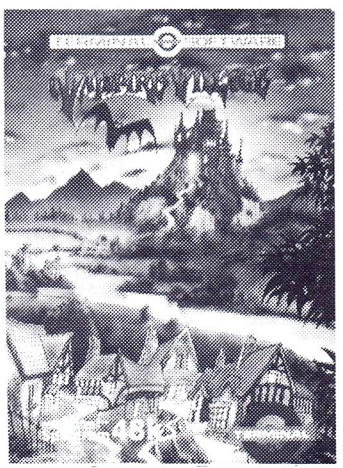
Star Command
Commodore 64

CITY
Spectrum 48K



STELLAR DODGER
Commodore 64

SPACE ISLAND
Spectrum 48K



VAMPIRE VILLAGE
Spectrum 48K

ALL $24.95

Alpine Computing Ltd.

P.O. Box 33-865 TAKAPUNA

MAIL ORDER SOFTWARE

COMPUTER INPUT

SPECTRUM

MAZEMAN (Spectrum 16K + 48K) $29.95. Use your skill to collect as many squares as you can but beware the hungry Hobgoblins. They chase relentlessly and you have only three lines. Grasp the magic Abersword and you have approx 10 seconds to counter attack and earn bonus points. Can you do it.

ADVENTURE (484 Spectrum) $34.95. Can you solve the secret of the caves. The original adventure game that will keep you busy for hours. PSST. Drop the black rod when you see the bird.

THE KNIGHTS QUEST (48K Spectrum) $34.95. You are a Knight of Camelot, set on finding the lost treasures of Merlin. On your way you will discover a princess held by the Wicked Wizard of Trill, battle Scorpions, elves, eagles. The list is almost endless! A full blooded adventure using split-screen graphics and text.

ABERSOFT — THE WIZARDS WARRIORS (48K Spectrum) $34.95. Control your warrior using your chosen method selected from the many options included in the program. Pit your wits against the denizens of the wizards crypt. But beware for they become even more difficult to evade. Can you withstand them in the final battle of the Abyss with nowhere to hide? Kill the Magic Eagle or Wizard for maximum points.

SPECTIPEDE (16K Spectrum) $19.95. See how long you can keep the Spectipede at bay as they descend upon you. You'll have the help of poison mushrooms and your gun which both kill the Spectipede. But look out for the spider — he will try to jump on you. For 1 or 2 players. Oeprates with most leading Joysticks or the keyboard.

PI-BALLED (48K Spectrum) $24.95. There you are, wandering the desert, contemplating wobbly spherical objects and minding your own business at the mystical pyramid of Pi, when your stumble across Burt, being badly bothered by the Ball Brothers, Bobby and Billy. Naturally, your first though is to help poor Burt, but you didn't reckon with Sid Snake and the Pixel Princes Col and Jas. Neither did you reckon with becoming addicted to this amazing arcade style game. Neither did you reckon with possibly the worst Reggae music ever committed, on the flipside of this cassette.

GOLF (16K Spectrum) $19.95. Similar to ZX81 Golf, but utilizing the Spectrum colour graphics and sound. For 1 or 2 players.

STYX (ZX Spectrum) $24.95. An arcade-style game where you have to battle your way across the River Styx towards Hades. The game is in three phases and armed with your laser gun you must move your way through the spider-filled maze and dive into eRiver Styx. The river holds a few surprises when you come up against deadly pirahna who don't seem too keen to let you past. Having dragged yourself out on the far beach, you find yourself fighting your way through the spirits of the dead, towards an encounter with the dark one himself.

PIMANIA (48K Spectrum) $34.95. The longest-running, cult-following, best-selling adventure quest ever. With the famous £6000 ($NZ12,000) Golden Sundail of Pi still to be won. If you have not heards its praises then we think you may be new to the computer business. With a free disco single on the flipside by Clair Sinclive and the PiMen.

MANIC MINER (48K ZX Spectrum) $24.95. Miner Willy, while prospecting, stumbles on an ancient long-forgotten mine shaft built by a superior civilisation. After centuries of peace the civilisation was torn apart by war, but nobody told the robots to stop working. So, can you guide Miner Willy through the 20 underground caverns to the surface, avoiding nasties like the Wacky Amoebatrons, Eugenes Lair, Mutant Telephones and Malevolant Toilets and sinking earth? Unbelievable graphics.

GNASHER (16K Spectrum) $19.95. The ultimate maze game. Eat the dots but look out for the ghosts. They could eat you! If you eat an energy pill you can eat the ghost. Full colour graphics and sound. Operates with most leading Joysticks or the keyboard.

STAR TREK (48K Spectrum) $24.95. See if you can rid the galaxy of the evil Klingons, save the Federation from the trecherous Romulans, race to protect your star-bases from attack. Are you star-ship commander material?

GO TO JAIL (48K Spectrum) $24.95. The definitive computer version of the best known board game in the world. For up to 5 players including the Spectrum. Save game facility, moving board display, we dare you to play against your computer. But, beware, it may well beat you.

ZX81

CHESS 1-4 (ZX81) $29.95. Now play up to 10 different levels of chess on your ZX81 castling and En Passant captures all included. Plus printer output for either permanent record of all moves or copy of graphics board.

ADVENTURE TAPE 1 — Full Adventures for the 16K ZX81 $29.95. Greedy Gulch — Discover the lost treasure mines in a deserted town.
Pharaoh's Tomb — try to discover the long dead Pharoah's treasures.
Magic Mountain — Recover the ancient Scrolls of Wisdom.

INVADERS (ZX81) $24.95. The old favourite space invaders — what else can we say but go get 'em.

MAIL ORDER

NOWATNIK PUZZLE AND OTHER DIVERSIONS $29.95. For either the ZX81 or 16K Spectrum. This is a program ideally suited to the T.V. display. A mind boggling challenge for puzzle enthusiasts, millions of different permutations.

BBC

CASSETTE 1 — STAR TREK. A superb version with 8 x 8 Galaxy Klingons, Phasers, Torpedoes, etc. — CANDY FLOOS. A tremendous new game in which you run a candy floss stall on Blackpool's Golden Mile. But watch the weather and the donkeys! **Only $34.95 MODEL A MODEL B**

CASSETTE 2 — Contains an exciting collection of games with music and graphics to keep the family amused for hours: HANGMAN, KRYPTOGRAM, DICE, BEETLE, GRAND NATIONAL and MUSIC. **Only $24.95 MODEL A MODEL B**

CASSETTE 3
MUTANT INVADERS. A brilliant new game. You can destroy the mutants before they land and try to destroy you with their radioactivity. BREAKOUT: A terrific version of the arcade game. **Only $34.95 MODEL A MODEL B**

CASSETTE 4 — BEEP-BEEP. Excellent version of the popular 'Simon' game. Very much enjoyed by children. **Only $24.95 For MODEL B (or + 32K)**

CASSETTE 5 — Contains BEEB-MUNCH. Our version of the record breaking PACMAN arcade game. Stunning hi-resolution colour graphics. **Only $34.95 For MODEL B (or + 32K)**

CASSETTE 6 — Contains SUPER HANGMAN. The special feature of this version is the hi-resolution animated man. Categories from educational to just plain fun! **Only $24.95 For MODEL B (or + 32K)**

CASSETTE 7 — Contains 3D MAZE. Pit your wits againts the computers logic in this highly realistic graphical game. **Only $24.95 For MODEL B (or + 32K)**

CASSETTE 12 — FLAGS. A superb educational program. The flags of the world are drawn in hi-resolution colour graphics. The program then tests your knowledge of flags and georgaphy. Have fun while learning. **Only $24.95 For MODEL B (or + 32K)**

CASSETTE 13 — HYPERDRIVE — A new, very addictive machine code arcade game. Guide your laser tanks around the network of passages destroying the drone Aliens — but beware, evil OTTO lies in wait! **Only $24.95 For MODEL B (or + 32K)**

CASSETTE 9 — Contains Model B Invaders. A superb feature adaptation of the arcade 'Space Invaders' game in machine code and hi-resolution colour graphics. **Only $34.95 For MODEL B (or + 32K)**

CASSETTE 11 — ATLANTIS. The superb fast action arcade game written in machine code to illustrate to the full the machines fantastic colour graphics and capabilities. This game includes all the usual ATLANTIS/SCRAMBLE features. **Only $34.95 For MODEL B (or + 32K)**

CASSETTE 14 — STREATOBOMBER — Arcade game. Can you keep the enemy fleet at bay, destroy the rogue Star Ship before it destroys your home planet? Superb graphics. **Only $34.95 For MODEL B (or + 32K)**

CASSETTE 15 — LEAP FROG — At last the fabulous Frogger game reaches the BBC Micro. Superbly written full colour machine code. The best version. **Only $34.95 For MODEL B (or + 32K)**

CASSETTE 16 — PONTOON & PATIENCE — Excellent rendition of the two very popular card games. **$34.95 For MODEL B (or + 32K)**

CASSETTE 17 — 5-A-SIDE SOCCA — At last!! The 2 player m/c game you have all been asking for. Uses joysticks or keyboard. Really exciting. **$34.95 For MODEL B (or + 32K)**

VIC20

SHARK ATTACK. Can you avoid the sharks and the octopi while you trail your atomic net? Very addictive game. Requirements — 3K expansion. **$19.95**

MARTIAN RAIDER. Fly across the enemy landscape, bombing as you go, but watch out for missiles! 3K expansion. **$19.95**

VIXEL No. 3. 3 Programs on one tape. In WARP you fly a space craft down an ever narrowing tunnel. FIFTEEN is a version of the classic puzzle (usually sold as a plastic toy). RAIL. Easy when there's only one train, but as you keep succeeding so the number of trains to be controlled keeps growing. Requirements — joystick for WARP & FIFTEEN — minimum of 3K memory expansion for RAIL.

REBEL DEFENDER. The imperial forces have just invaded your base planet, the water world of Aakwa. They have brought with them their most awesome weapon, the imperial stalker. Requirements — 8K expansion, paddles. **$24.95**

ULTIMATE TANK. The year is 1999. Earth is being overrun by mutant spiders and giant space eyes. Each battle zone is patrolled by 1 or 2 nuclear tanks. Their mission is to search out and destroy. Requirements — 8K expansion, joystick. **$24.95**

CHIMP CHASE. The object of chimp chase is to guide a small yellow chimp through the zoo in order to open all the cages. Good colour and sound effects. Requirements — Unexpanded VIC, joystick optional. **$24.95**

COSMIC CRYSTALS. As commander of a Cosmic Space Station it is your mission to defend a sector of the force field vault where the 'Cosmic Crystals' are kept. Requirements — Unexpanded VIC, paddles. **$24.95**

BLASTEROIDS. As the captain of a fleet of 3 space cruisers, your mission is to eliminate an asteroid field. Good colour and sound; 3 skill levels. Requirements — Unexpanded VIC, joystick optional. **$24.95**

CRIBBAGE. The age-old card game for 2 players — sorry! I meant for one player and his computer! Requirements — 16K expansion. **$24.95**

MARTIAN RAIDER. Similar to skramble. Your mission is to fly across the Martain landscape destroying their cities, but it's not easy! Enemy missiles and UFO's are out to get you. Your fuel range can be extended by hitting enemy fuel dumps. Requirements — Unexpanded VIC, joystick optional. **$19.95**

CITY BOMBER. Flatten the buildings with bombs so that you can land your plane safely. Very addictive. Requirements — Unexpanded VIC. **$19.95**

MIS CHECKBOOK. Keep track of your cashbook; results filed on tape. Running cheque balances, dates, search by criteria, analyses, etc. Requirements — Unexpanded VIC. **$19.95**

MULTISOUND SYNTHESIZER. The electronic music synthesizer, for the VIC. **$19.95**

MICROHEX ASSEMBLER/ EDITOR. Microhex is 6502 Assembler /editor which allows you to produce a machine code listing using the 6502 Mnemonic Instruction set. Requirements — Minimum 3K expansion. **$24.95**

VIC AMORTISATION. This'll help you to be a bit better informed about the next loan you want! Requirements — Unexpanded VIC. **$24.95**

VIC TRIP & PARTY PLANNERS. 2 programs which will help you to accurately plan what the costs are likely to be for your next trip or party. Requirements — Unexpanded VIC **$24.95**

MAIL-IT 20. A very easy to use mailing list/label program for the VIC. Re-

quirements — minimum 8K expansion — datasette and/or 15401541 disk drive — — VIC or RS 232 printer. **$24.95**

STOCK MASTER 20. Stock Master is an inventory control program. Requirements — 8K expansion — datasette or 1540/1541 disk drive — 1525/26 printer (optional). **$24.95**

C64

REPTON — Diskette Only $84.50. Repton is a 'Defender' type game, but more complicated and sophisticated than any you'll have seen. The lower part of the screen gives you a cockpit view of the battle area, a nice blend of defender and flight simulation. Simply amazing. What more can we say!

FAST EDDIE — Diskette Only $84.50. Just send Fast Eddie around the screen using a joystick, climb up and down ladders and grab point-scoring objects. Easy. Well it would be if it wasn't for these nasty little critters that keep racing at fast Eddie. This game is more challenging and difficult to master than most.

SQUISH 'EM — Diskette Only $84.50. You're in a partly constructed building, and you must climb to the top to retrieve various objects by climbing up pipes from floor to floor. See Software Review.

JAWBREAKER — Diskette Only $73.00. If you like the propsect of being let loose in a candy store then you'll love this game. If not then you'll still probably love this game! The most hilarious moment occurs when a toothbrush races out to brush your teeth! (So perhaps it even qualifies as educational!!!) Beautiful musical effects, making the most out of the 64's sound capabilities.

TEMPLE OF APSHAI — Disk or Cassette $89.00. Enter the "Temple of Apshai," the first in our DUNJONQUEST series, the computer game that offers you the chance to perform heroic deeds in a labyrinth filled with treasures, traps and monsters. Animated colour graphics portray the "Temple" and all its contents — magic, monsters, doomed cities and damsels in distress. Do battle in real time, with over 20 types of monsters, each represented by a unique graphic shape. Special sound effects intensify your quest, with arrows flying, wings beating and footsteps approaching in the dark.

Curse of Ra — Upper Reaches of Apshai. Expansion modules for Temple of Apshai, which provide further thrill: NOTE: these are not complete games in themselves — you must have Temple of Apshai to use them. Available on diskette or cassette. **Price (each) $58.00**

MONOPOLY. The great board game on computer for 2 players. This is a long well written program that should provide hours of fun. Excellent colour graphics and sound. The board is displayed on screen. **$19.95**

OTHELLO/REVERSI. It is a game of skill, played on an 8 x 8 square board. The object is for a player to occupy more spaces on the board than his opponent. **$19.95**

COLLISON. A fast paced game requiring a joystick and lots of time, as it's rather addictive. Choice of whether you play the computer or two players, each with a joystick, play each other. **$19.95**

MATCHMAKER. This is an enhanced variant of the card game 'pairs'. Each player (several can play) chooses two cards which the computer turns face up to display if they are the same then that player scores points. **$19.95**

DELTA RACE. A version of the popular moon-landing type games with excellent high resolution graphics and sound effects. Once you've landed successfully, you must negotiate your way through an underground silo. Joystick required. **$19.95**

TRONIC CYCLE. You are the driver of a high speed cycle which you must manouvre within a predetermined grid, avoid randomly placed obstacles. Action sound effects, multiple skill levels, joystick or keyboard control. **$24.95**

BREAKEVEN. Examine the relationship between fixed costs, variable costs, prices and discounts, on a specific project or product and to establish the resulting profit, loss and breakeven point. **$24.95**

MAIL-IT 64. Mail-It 64 is an easy to use mailing list/label program designed for the 64 Requirements — Datasette and/or 1541 disk drive — VIC or RS232 printer. **$24.95**

STOCKMASTER 64. Stockmaster 64 is an inventory control program. Tape or diskette. Printer optional. **$24.95**

SUPER SPRITE. Sprites are an amazing feature of the Commodore 64. Super Sprite makes this so much easier, by allowing you to draw and edit sprites on a large screen the data can the be saved on cassette or diskette. Price — **Tape $24.95: Diskette $34.95**

TRIP & PARTY PLANNERS 64. 2 programs which will help you to accurately plan what costs are likely to be for your next trip or party. **$24.95**

JUMPMAN. $89.00
Disk or Cassette.

FROGGER.
$84.50 Disk Only.

SWORD OF FARGOAL. Adventure at the highest level. Sound, graphics, hours of fun. **$74.00.**
Disk or cassette.

BEACH-HEAD
The ultimate "War" game. A peaceful island is being held by a ruthless dictator and his military troops. As Chief Commander of land and sea forces in the Pacific, you must obtain a quick naval victory and then invade the island with land forces. If your troops succeed in penetrating the island defense systems, the most difficult challange still remains; capturing the enemy fortress of KUHN-LIN.

GENESIS
In GENESIS, you're transformed into the deadly king scorpion fighting to protect your domain. The fatally venemous spiders continue crawling from the earth's core as they attempt to destroy you. The spiders gnaw away at the tunnel, as you blast them with your deadly venom. Balanced cautiously on the edge of your domain, you must avoid falling into the deadly pit. The battle intensifies as the spiders eat away at the walls of the tunnel, and you become more limited in movement. Your only hope is the special brick which allows you to rebuild. Grab it if you can.

CROSSFIRE
They have landed and are taking over the city. Steadily they make their way across town, destroying everything in their paths. The town has been evacuated, and your regiment has retreated, leaving you alone in the city at the mercy of the aliens. The aliens have you surrounded, and laser shots fly from all directions. Your movements are confined but you haven't given up. If you are to live, you'll have to concentrate on where the shots are coming from and where you're going because if you don't you'll get caught in the CROSSFIRE.

BLUE MAX
You are Blue Max of the R.A.F. in command of a biplane Fighter/bomber. Your mission is to pulverize the enemy's airfields and bridges and to destroy as many enemy fighters as possible. From out of the sun, enemy planes dive and attack, machine guns chattering. From the ground, huge guns boom their deadly welcome. You smile grimly to yourself as another bird trails a smoking plume to the ground. Bombs away and God save the King!

O' RILEY'S MINE
Prospectors and miners have made fortunes overnight deep within the enchanting Mother Lode country of California. Their wild tales of buried treasure still excite a world dazzled by

easy money. One such miner is a mad Irishman named Timothy O'Riley. He is in search of coal, oil, gold, rubies and diamonds. You'll guide him through the mysterious depths of the earth as he attempts to dig up hidden riches. But watch out! Deathly dangers and unknown creatures lurk there also. He's disturbed their peace building his mine shaft and now they want revenge. And since they haven't had a miner to eat in many years, they're more than just hungry! Being wise and cunning, O' Riley's prepared, for he's brought dynamite along. He must set his explosions at exactly the right time, though, or risk drowning in a rushing subterranean river.

ALL RETAL AT $79.95 UNLESS OTHERWISE STATED.

POOYAN Retail $79.95

Bring all the excitement and fun of POOYAN into your home! Experience the colourful hi-res graphics, fast action, and arcade-style play on your own computer. It's a game of quick reflexes and fast thinking as you battle a pack of vicious, hungry wolves in order to protect your helpless piglets roaming the forest. Your weapon at hand is a bow-and-arrow. And in your dispair you toss chunks of meat at your enemy hoping to lure him out of battle while you catch your breath! The wolves don't give up easily and you won't either! Once you play this game you can't put it away! Clinging to air-filled balloons, the wolves travel up and down the forest valley as you glide up and down in your tram car. As they hurl objects at you, you must fight them foff with your arrows and meat. Pop their balloons and look out below!

FINAL FLIGHT Retail $65.00

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COMPUTER BOOKS

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by John Herriott $19.95 TAB

The VIC-20 is an amazingly powerful computing machine capable of all kinds of exciting home and business applications. The author's engaging style makes it more interesting than the average programming manual. You'll quickly discover that the author believes in introducing advanced features making you wade through tons of background material.

WHAT CAN I DO WITH MY TIMEX 1000, TIMEX 1500 or ZX81?
Valentine $23.95 Wiley

56 complete programs ready to run on your TS1000, TS1500, ZX81 complete programs including 35 programs that run on the 1K or 2K versions! Sophisticated games, fortune telling and gambling, file programs payroll deductions, graphics, a "checkbook," and many many others.

MORE THAN 32 BASIC PROGRAMS FOR VIC-20
Rugg-Feldman $47.95 dilithium

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This practical, up-to-the minute sourcebook comes to the rescue of every small businessman who's thinking of acquiring a computer system of any type; look at the advantages and the perils of converting business recordkeeping to computerization; realistic advice to make such decisions as how much computing power is needed; what the system should cost; choose the right computer hardware and software components, do you need an outside consultant to help in planning your system.

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by Kascmer $17.95 SYBEX

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An essential book for any user of the latest home computer from Commodore Business Machines. A refresher course in Basic programming through Machine Code, then considering in great detail sprites graphics and sound.

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Lassellen Ramsay $21.95 SYBEX

Designed to give you hands-on experience with your computer — style clear and non-technical. Learn to: set the date and time on your PC, use basic commands, menu selections, and handle, store, and protect diskettes properly name, list, copy, rename, and delete files use application programs

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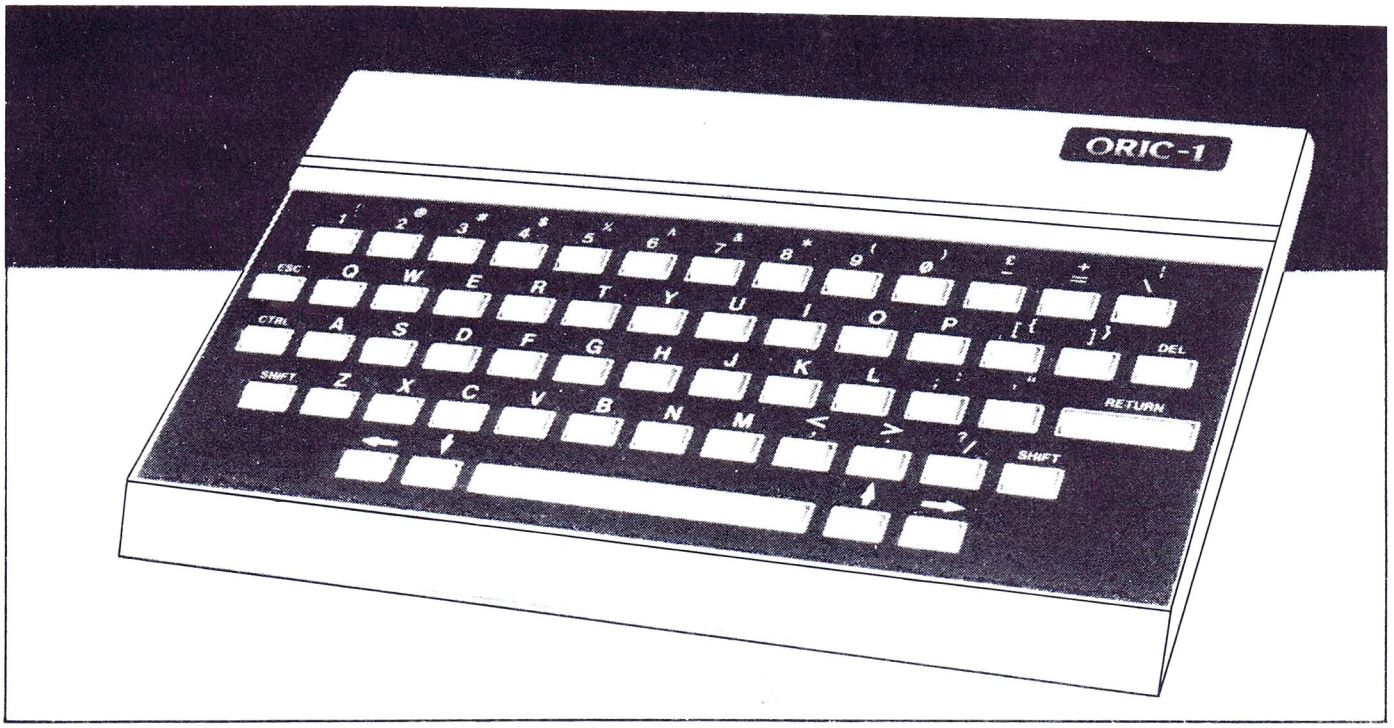

GAMES PACK 48K — $58.75. The brilliant value for money mult-games pack has no less than seven exciting games. Unlike most programs, you can eventually become tired of playing the same old thing — not so with the multi-games pack. When you have played one through, you can move on to another. The programs vary from fast reaction arcade games to real brain teasers. They are: Laser Station, Obstruction, Mazatronic, Maths Test, Milliblox, Demolition, Noughts and Crosses.

HARRIER ATTACK — $48.95. You pilot a Harrier Jump Jet and your mission is to destroy a heavily defended inner island installation. You will have to travel at over 700 MPH so as to maximise your fuel use. En route, you will encounter ship-to-air missiles, heavy ground fire and difficult-to-defend attacks from Mirage Jets complete with heat-seeking missiles. If you can successfully defend yourself with your own guns and bombs, you will reach your target. Fly down and commence your bombing run. The more you destroy the more points you get. Then, if you are still alove and have not run out of fuel, you can then land on another carrier at the other side of the island. (Whew).

We guarantee that you won't get through this game for at least fifteen times even on Level 1. 5 skill levels. All sound effects.

INVADERS — $58.75. This classic arcade game, which has built up a cult following amongst game fanatics, is reproduced here for the ORIC Micro. This full feature machine code game includes smooth action walking invaders and options for choice of missile speed, bomb speed, invader speed, invisible invaders and overall game difficulty.

STARFIGHTER — $48.95. Really stirring stuff.

Welcome to the game Starfighter. You have just volunteered to captain one of the Federation's most powerful intergalactic starships on a mission to clear the Andromedan galaxy of alien intruders. Before entering this galaxy you'll have to destroy the aliens which have infiltrated past the starfleet's outlying fighters, and are now jamming the star-gate to Andromeda. To complete your mission you must wipe out all the aliens in the nine sectors of this galaxy, and then bring your ship safely through the last star-gate back to the war-free zone. You will be protected by powerful but limited energy shields, and will have both long-range photon-torpedoes and short-range three dimensional phasors with which to engage the enemy.

THE QUEST OF THE HOLY GRAIL — $48.95. The aim of this high-adventure game is to find the Holy Grail which has been hidden in the Castle Precarious. For you, it will prove a test of skill, logic, intelligence and luck.

In yor quest you will encounter a whole host of monsters but luckily you will also find weapons and armour to fight with. Your strength starts at 250 but you can increase this by buying strength units from traders with jewels and gold which you will win on your journey. A trader can also sell you wound ointment to help you recover from encounters with the monsters in battle and at the end, the Holy Grail awaits.

XENON 1 — $58.75. You are a fleet commander. Your mission is to journey to the planet Rodon and protect it from the Zorgon Battle Star. En route you will encounter the warlike Aars who test your skills with their hypnotic rotating battle formation. They have the ability to clone on destruction. If you survive this battle you travel through deep space avoiding meteorite showers, then skilfully refuel to arrive at the planet Rodon and protect it from airborne attacks of the Paratrons. Finally, the ultimate accolade: try to destroy the Zorgon Battle Star.

This game has been reviewed overseas and given 5 out of 5 for quality and speed.

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 $10 and $30, depending on the size and quality of the program for each contribution published.

SPECTRUM

Pucman

Donald MacKenzie

AUCKLAND

Here is my version of the popular arcade game Pacman. I have seen many in other magazines, but none that make full use of Spectrum's sound and graphics capabilities. This is what I have set out to do. The game features 5 different fruits — an apple, cherries, an orange, a pretzel and a banana, which are put up in order. I have also made it possible to catch the ghost (a feature lacking in most of the Pacman games), but you had better be close to the ghost when you eat him as you have only a limited time in which to eat him! The ghost is intelligent and fast, except it is possible to trap him and thus render him immobile if he comes across a corner in the right way. Don't worry! This is not a mistake — it is a chance for you to get a go at the dots. It is quite hard to trap him, but not impossible, and well worth while when he is. There is only one ghost and the maze is Atari-ish in style. The program is long and uses nearly all of the Spectrum's memory. The listing is long so type it in carefully and if it doesn't go in successfully at first, check and then re-check, as it will be worth it in the end. I am 14 and got my Spectrum for Christmas and have been on it about 2-3 hours a day since then. Before this time, I had had no computer experience at all.

```
  1 RESTORE
  10 REM Pucman
  20 GO SUB 9000: LET hi=0
  30 GO SUB 7000
  35 GO SUB 5000
  40 GO SUB 8000
  80 PRINT INK 6;AT v,h;"■"
  90 LET a$=INKEY$
 100 LET p$=("■" AND a$="o")+("■
" AND a$="p")+("■" AND a$="a")+(
"■" AND a$="z")
 110 LET h=h+(INKEY$="p" AND ATT
R (v,h+1)<>5)-(INKEY$="o" AND AT
TR (v,h-1)<>5)
 120 LET v=v+(INKEY$="z" AND ATT
R (v+1,h)<>5)-(INKEY$="a" AND AT
TR (v-1,h)<>5)
 125 IF ATTR (v,h)=64+frucol THE
N BEEP .05,20: LET sc=sc+50*fru:
 LET fru=fru+1
 130 IF ATTR (v,h)=2 THEN GO TO
1000
 135 IF ATTR (v,h)=131 THEN GO S
UB 3000
 140 IF ATTR (v,h)=4 THEN LET sc
=sc+1: BEEP .005,6: LET dot=dot+
1
 145 PRINT INK 7;AT 18,7;sc
 146 IF dot=tot THEN LET fru=fru
+1: GO SUB 8000: LET dot=0
 150 PRINT AT v1,h1; INK 0;" ":
LET v1=v: LET h1=h
 160 PRINT AT v,h; INK 6;p$
 180 LET gh=gh+(gh<h AND ATTR (g
v,gh+1)<>5)-(gh>h AND ATTR (gv,g
h-1)<>5)
 185 IF gh=gh1 THEN LET gv=gv+(g
v<v AND ATTR (gv+1,gh)<>5)-(gv>v
 AND ATTR (gv-1,gh)<>5)
 188 IF ATTR (gv,gh)=0 THEN PRIN
T AT gv1,gh1; INK 0;" ": GO TO 1
90
 189 IF ATTR (gv,gh)=64+frucol T
HEN PRINT AT gv,gh; INK frucol;
BRIGHT 1;CHR$ (fru+154): LET gh=
gh+(gh<=h)-(gh>h)
 190 PRINT AT gv1,gh1; INK 4;"."
 193 IF ATTR (gv,gh)=6 THEN GO T
O 1000
 195 LET gh1=gh: LET gv1=gv
 197 IF gh=h AND gv=v THEN GO TO
 1000
 200 PRINT AT gv,gh; INK 2;"■"
 500 GO TO 80
 990 STOP
1000 LET v=v1: LET h=h1
1005 INK 6
1010 BEEP .1,10
1020 PRINT AT v,h;"■"
1030 BEEP .1,9
1040 PRINT AT v,h;"■"
1050 BEEP .1,8
1060 PRINT AT v,h;"■"
1070 BEEP .1,7
1080 PRINT AT v,h;"■"
1090 BEEP .1,6
1100 PRINT AT v,h;"■"
1110 BEEP .1,5
1120 PRINT AT v,h;"■"
1130 BEEP .1,4
1140 PRINT AT v,h;"■"
1150 BEEP .1,3
1160 PRINT AT v,h;"■"
1170 BEEP .1,2
1180 PRINT AT v,h;" "
1190 BEEP .1,1
1195 PRINT AT gv,gh; INK 0;" ":
PRINT AT v,h; INK 0;" "
1200 LET v=13: LET h=15: LET i=
i-1: LET gv=5: LET gh=15
1210 LET v1=v: LET h1=h
1220 FOR f=0 TO 31: PRINT PAPER
1;AT 10,f;" ": NEXT f
1250 GO SUB 8260: GO TO 50
3000 PRINT AT v1,h1;" "
3010 PRINT INK 6;AT v,h;p$: LET
v1=v: LET h1=h
3020 PRINT AT gv,gh; INK 7;"■"
3030 BEEP .1,6: BEEP .1,10: BEEP
 .2,15: BEEP .1,4: BEEP .3,16
3040 FOR f=1 TO 10
3080 PRINT INK 6;AT v,h;"■"
3090 LET a$=INKEY$
3100 LET p$=("■" AND a$="o")+("■
" AND a$="p")+("■" AND a$="a")+(
"■" AND a$="z")
3110 LET h=h+(INKEY$="p" AND ATT
R (v,h+1)<>5)-(INKEY$="o" AND AT
TR (v,h-1)<>5)
3120 LET v=v+(INKEY$="z" AND ATT
R (v+1,h)<>5)-(INKEY$="a" AND AT
TR (v-1,h)<>5)
3125 IF ATTR (v,h)=64+frucol THE
N BEEP .05,20: LET sc=sc+50*fru
3130 IF ATTR (v,h)=7 THEN GO TO
3300
3140 IF ATTR (v,h)=4 THEN LET sc
=sc+1: LET dot=dot+1
3145 PRINT INK 7;AT 18,7;sc
```

```
3146 IF dot=tot THEN LET fru=fru
+1: GO SUB 8000: LET dot=0
3150 PRINT AT v1,h1; INK 0;" ":
LET v1=v: LET h1=h
3160 PRINT AT v,h; INK 6;p$
3170 BEEP .03,20: BEEP .04,10
3180 LET gh=gh+(INT (RND*2)+1 AN
D ATTR (gv,gh+1)<>5)-(INT (RND*2
)+1 AND ATTR (gv,gh-1)<>5)
3185 LET gv=gv+(INT (RND*2)+1 AN
D ATTR (gv+1,gh)<>5)-(INT (RND*2
)+1 AND ATTR (gv-1,gh)<>5)
3188 IF ATTR (gv,gh)=0 THEN PRIN
T AT gv1,gh1; INK 0;" ": GO TO 3
193
3189 IF ATTR (gv,gh)=64+frucol T
HEN PRINT AT gv,gh; INK frucol;
BRIGHT 1;CHR$ (fru+154): LET gh=
gh+(gh<=h)-(gh>h)
3190 PRINT AT gv1,gh1; INK 4;"•"
3193 IF ATTR (gv,gh)=6 THEN GO T
O 3300
3195 LET gh1=gh: LET gv1=gv
3200 PRINT AT gv,gh; INK 7;"▒"
3210 NEXT f
3220 LET sc=sc+5: LET dot=dot+1
3225 PRINT AT gv,gh; INK 2;"▒"
3227 FOR g=1 TO 8: NEXT g
3230 RETURN
3300 PRINT AT gv1,gh1; INK 0;" "
3310 PRINT AT gv,gh; INK 7;"⁘"
3320 FOR f=0 TO 5: BEEP .003,-f:
 BEEP .003,f: NEXT f
3330 PRINT AT gv,gh; INK 0;" "
3340 LET gv=5: LET gh=15: LET gv
1=gv: LET gh1=gh
3350 RETURN
5000 INK 6: PAPER 0: BORDER 1: C
LS : PRINT AT 0,0;"■■■■ ■ ■ ■■■
";AT 1,0;"■ ■ ■ ■■";AT 2,0;"■
■■ ■ ■ ■";AT 3,0;"■■■■ ■■
■"
5005 PRINT AT 2,14;"■■"
5010 PRINT AT 0,17;"■ ■■ ■■ ■
 ■";AT 1,17;"■■■■ ■■ ■■■";A
T 2,17;"■ ■ ■ ■■■ ■ ■■";AT 3,17
;"■ ■ ■ ■ ■ ■"
5020 PRINT INK 5;AT 5,0;"▒▒▒▒▒▒▒
▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
5030 BRIGHT 1: PRINT INK 4;AT 7,
2;"▒ "; INK 2;AT 9,2;"▒ "; INK 6
;AT 11,2;"▒ "; INK 7;AT 13,2;"▒
"; INK 6;AT 15,2;"▒ "
5040 BRIGHT 0: PRINT INK 4;AT 17
,2;"•"
5090 PRINT AT 21,2; INK 3; FLASH
 1;"▒"; FLASH 0; INK 5;" 5"
5170 INK 5: PRINT AT 7,4;"50";AT
 9,4;"100";AT 11,4;"150";AT 13,4
;"200";AT 15,4;"250";AT 17,4;"1"
;AT 19,4;"100";AT 19,2; INK 7;"▒
"
5180 PRINT INK 6;AT 9,22;"▒";AT
11,22;"▒";AT 13,22;"▒";AT 15,22;
"▒"; INK 5;AT 9,24;"a";AT 11,24;
"p";AT 13,24;"z";AT 15,24;"o"
5190 PAUSE 0
5200 RETURN
6000 PRINT AT 9,10;"Another go?"
6010 LET a$=INKEY$
6020 IF a$="y" THEN GO TO 30
6030 IF a$="n" THEN STOP
6040 GO TO 6010
7000 LET sc=0
7010 LET v=13: LET h=15: LET v1=
v: LET h1=h
7020 LET li=3: LET dot=0: LET to
t=275
7030 LET gv=5: LET gh=15
7050 LET gv1=gv: LET gh1=gh
7060 LET fru=1
7500 RETURN
8140 FOR f=17 TO 21: FOR g=0 TO
31: PRINT PAPER 1;AT f,g;" ";: N
EXT g: NEXT f
8150 BORDER 1: PAPER 0: INK 5: F
OR f=1 TO 14 STEP 4: PRINT AT f,
0;"■ ■
 ■": NEXT f
8160 FOR f=2 TO 15 STEP 4: PRINT
 AT f,0;"■ ■■■ ■ ■ ■ ■■■■ ■ ■
■ ■ ■■■ ■": NEXT f
8170 FOR f=3 TO 16 STEP 4: PRINT
 AT f,0;"■ ■
 ■ ■": NEXT f
8180 FOR f=4 TO 12 STEP 4: PRINT
 AT f,0;"■■■ ■■■ ■■■■ ■■■■■ ■■■
■ ■■■ ■■■": NEXT f
8190 FOR f=1 TO 17 STEP 16: PRIN
T AT f-1,0;"■■■■■■■■■■■■■■■■■
■■■■■■■■■■■■■■■": NEXT f
8210 INK 4: FOR f=1 TO 14 STEP 4
: PRINT AT f,1;"•••••••••••";AT f
,12;"••••••••";AT f,21;"••••••••
••": NEXT f
8220 FOR f=2 TO 15 STEP 4: PRINT
 AT f,1;"•";AT f,5;"•";AT f,7;"•
";AT f,10;"•";AT f,12;"•";AT f,1
9;"•";AT f,21;"•";AT f,24;"•";AT
 f,26;"•";AT f,30;"•": NEXT f
8230 FOR f=3 TO 16 STEP 4: PRINT
 AT f,1;"•••••";AT f,7;"••••••••
••••••••••••";AT f,26;"•••••": NEX
T f
8240 FOR f=4 TO 12 STEP 4: PRINT
 AT f,3;"•";AT f,7;"•";AT f,12;"
•";AT f,19;"•";AT f,24;"•";AT f,
28;"•": NEXT f
8250 PRINT INK 5;AT 7,13;"■     ■
"
8255 PAPER 0: INK 3: PRINT FLASH
 1;AT 2,1;"▒";AT 2,30;"▒";AT 14,
1;"▒";AT 14,30;"▒"
8260 PRINT INK 7;AT 18,1;"Score
";sc
8270 PRINT INK 7;AT 18,22;"Lives
": FOR f=1 TO li: PRINT AT 18,2
7+f; INK 6;"▒": NEXT f
8273 IF sc>hi THEN LET hi=sc
8275 PRINT INK 7;AT 19,12;"Hi ";
hi
8280 IF li=0 THEN PRINT AT 18,28
;0: GO TO 6000
8500 IF fru>5 THEN LET fru=1
8501 IF fru=1 THEN GO TO 8510
8502 IF fru=2 THEN GO TO 8520
8503 IF fru=3 THEN GO TO 8530
8504 IF fru=4 THEN GO TO 8540
8505 IF fru=5 THEN GO TO 8550
8510 LET frucol=4: PRINT AT 9,15
; BRIGHT 1; INK frucol;"▒": RETU
RN
8520 LET frucol=2: PRINT AT 9,15
; BRIGHT 1; INK frucol;"▒": RETU
RN
8530 LET frucol=6: PRINT AT 9,15
; BRIGHT 1; INK frucol;"▒": RETU
RN
8540 LET frucol=7: PRINT AT 9,15
; BRIGHT 1; INK frucol;"▒": RETU
RN
8550 LET frucol=6: PRINT AT 9,15
; BRIGHT 1; INK frucol;"▒": RETU
RN
8990 RETURN
9000 FOR a=USR "a" TO USR "s"+7
9010 READ user: POKE a,user
9020 NEXT a: RETURN
9025 DATA 60,126,255,255,255,255
,126,60
9030 DATA 0,66,195,231,255,255,1
26,60
9040 DATA 60,126,248,240,240,248
,126,60
9050 DATA 60,126,255,255,231,195
,66,0
9060 DATA 60,126,31,15,15,31,126
,60
9070 DATA 36,102,231,231,255,255
,126,60
9080 DATA 0,0,129,195,255,255,12
6,60
9090 DATA 0,0,0,0,255,255,126,60
9100 DATA 0,0,0,0,60,126,126,60
9110 DATA 0,0,0,24,24,0,0,0
9120 DATA 129,66,0,0,0,0,66,129
9130 DATA 12,24,62,127,127,127,1
27,62
9140 DATA 3,2,6,10,50,118,46,4
9150 DATA 60,126,251,253,255,255
,126,60
9160 DATA 0,102,153,153,153,90,1
```

```
65,231
9170 DATA 6,2,6,14,30,60,248,112
9180 DATA 0,0,0,0,60,60,24,24
9190 DATA 60,102,255,165,165,255
,102,60
9200 DATA 28,62,42,107,127,127,1
09,73
9210 DATA 24,60,126,219,219,255,
219,145
9300 REM
```


SEGA

Astro Laser

David Palmer

ROTORUA

My hi-score is 44,511.

The object of the game is to shoot down different letters and numerals as they fly across the screen, while at the same time, familiarising the keyboard. To shoot the character, just press the key that corresponds to that character.

The playing level, which you select at the start, determines how fast the characters move across the screen, and also how many points you get for each hit. The number of points for each hit is also dependant on how quickly it is hit, the fast the more points.

To start with, you have five lives — each life being equal to ten hits. So after every ten hits, a life is lost. A life is also lost when a character goes right across the screen without being hit. Also after every ten hits, or a missed character, the game steps up a level.

The game is designed so it is impossible to start in a slow round and get a high score. The way to get a high score is to start in as high a round as you can handle.

THINGS TO WATCH OUT FOR:

Delete all spaces between words and statements so as to keep the speed up.

In lines 310, 330, 350, 400, 1250 you put graphics characters inside the quotation marks.

In line 1280, there are 14 graphics symbols, a space, then words "letters and numbers".

Be careful when typing in the data or else the whole screen will be painted green and the game ruined.

When asked if you want instructions or not, input either one or two then press CR.

```
10 REM ASTRO#2
20 REM BY DAVID PALMER:31/3/84
30 CLS
40 SCREEN 2,2:COLOR11,1,(0,0)-(255,191
),1
50 Z$="ASTRO LASER"
60 LINE (20,110)-(215,113),12,BF
70 LINE (20,87)-(215,90),12,BF
80 V=23
90 FOR Z=1 TO LEN(Z$)
100 COLOR11,1
110 S$=MID$(Z$,Z,1)
120 FOR X=240 TO V STEP -20
130 SOUND1,X+90,15
140 CURSORX,96:PRINTCHR$(17);S$
150 CURSORX,96:PRINT CHR$(8)
160 NEXT X
170 CURSOR V,96:PRINT CHR$(17);S$
180 V=V+15
190 NEXT Z
200 SOUND 0
210 FOR Z=23 TO 203 STEP 15
220 LINE (125,191)-(Z+7,101),8
230 BLINE (125,191)-(Z+7,101)
240 CURSORZ,96:PRINT CHR$(8)
250 SOUND1,Z+90,15
260 NEXT Z
270 SOUND0
280 RESTORE1400
290 SCREEN 1,1:CLS:COLOR1,7
300 CURSOR 5,10:PRINT"DO YOU WANT:-"
310 CURSOR 5,11:PRINT"(GRAPHICS,SHIFT+
G)*13"
320 CURSOR 5,13:PRINT"1. INSTRUCTIONS O
N HOW TO PLAY."
330 CURSOR 5,16:PRINT"(GRAPHICS,SHIFT+
N)*2"
340 CURSOR5,16:PRINT"2. TO START GAME."
350 CURSOR 5,17:PRINT "(GRAPHICS,SHIFT
+N)*2"
360 INPUT F
370 IF F=1 THEN GOSUB 1230
380 SCREEN 1,1:CLS
390 CURSOR 5,10:PRINT "INPUT LEVEL:1 T
O 10"
400 CURSOR 5,11:PRINT "(GRAPHICS,SHIFT
+B)*19"
410 INPUT F
420 SCREEN 2,2:CLS:COLOR15,1,(0,0)-(25
5,191),1
430 S=0
440 PATTERN S#0,"010507FF7F3F077F"
450 PATTERN S#2,"0040C0FEFCF8C0FC"
460 PATTERN S#4,"004020101D0F270F"
470 PATTERN S#5,"FF0F070F1D182040"
480 PATTERN S#6,"8081929CBCF8F0F8"
490 PATTERN S#7,"FFF8F0F8DC8C8281"
500 PATTERN S#8,"0008241C7F1C2A08"
510 PATTERN S#12,"0103070F1F3F7F7F"
520 PATTERN S#16,"7F7F3F1F0F070301"
530 MAG 1
540 LINE(1,1)-(255,3),5,BF
```

```
550 LINE (255,3)-(253,190),5,BF
560 LINE (253,190)-(1,188),5,BF
570 LINE (1,188)-(3,1),5,BF
580 LINE (10,22)-(245,25),8,BF
590 GOSUB 1400
600 CIRCLE (30,35),5,11,1,0,1,BF
610 CIRCLE (200,50),10,11,1,0,1,BF
620 BCIRCLE(190,50),17,11,1,.75,.25,BF

630 CIRCLE (100,70),3,8,1,0,1,BF
640 SPRITE 0,(118,165),0,11
650 SPRITE 12,(245,85),12,5
660 SPRITE 16,(245,105),16,5
670 K=F+15
680 FOR A=1TO70
690 B=INT(RND(1)*138)+6:C=INT(RND(1)*2
40)+8:PSET(C,B),11:NEXT A
700 CURSOR 10,10:PRINTCHR$(17);"YOUR S
CORE IS:0000"
710 D=INT(RND(1)*42)+48:A$=CHR$(D):L=L
+1
720 FOR E=245 TO 10 STEP - F:CURSOR E,
96:PRINT CHR$(16);A$:SOUND1,E*11,15:B$
=INKEY$
730 CURSOR E,96:PRINT CHR$(8):IF B$=A$
 THEN 780
740 NEXT E
750 F=F+3
760 IF K<F THEN 1020
770 GOTO 710
780 IF K<F THEN 1020
790 LINE (124,165)-(E,96),8
800 LINE (126,165)-(E,96),8
810 BLINE  (124,165)-(E,96)
820 BLINE (126,125)-(E,96)
830 COLOR 9,1
840 CURSOR E,96:PRINT CHR$(16);"*"
850 SPRITE 8,(E,96),8,9
860 FOR Q=1TO 30:NEXT Q
870 CURSOR E,96:PRINT CHR$(17);"*"
880 SPRITE 4,(E-7,89),4,9
890 FOR Q=1 TO 40:NEXT Q
900 CURSOR E,96:PRINTCHR$(8)
910 SPRITE 8,(E,96),8,0:SPRITE 4,(E-7,
89),4,0
920 SOUND 4,1,15
930 FOR T=1 TO 20:NEXT T
940 SOUND 4,2,0
950 COLOR 11,1
960 FOR Z=175  TO 235 STEP 12:SOUND 1,
INT(RND(1)*300)+110,15
970 CURSOR Z,10:PRINT CHR$(8)
980 NEXT Z
990 S=S+INT(E*F/4):CURSOR 175,10:PRINT
 CHR$(17);S
1000 IF L>10 THEN F=F+2:L=0
1010 GOTO 710
1020 X$="GAME OVER!"
1030 I=40
1040 SOUND 0
1050 COLOR 9,1
1060 FOR G=1 TO LEN(X$)
1070 Y$=MID$(X$,G,1)
1080 LINE(125,96)-(I+6,132),9
1090 BLINE(125,96)-(I+6,132),9
1100 I=I+14
1110 FOR Z =15 TO 1 STEP -2
1120 SOUND 1,320,Z:SOUND 0:SOUND1,330,
Z
1130 NEXT Z
1140 CURSOR I,133:PRINT CHR$(17);Y$
1150 LINE (I-8,146)-(I+15,146),9,BF
1160 SOUND 0
1170 NEXT G
1180 FOR AD=15 TO 1 STEP -1
1190 A=INT(RND(1)*200)
1200 SOUND 1,310,AD:SOUND 1,360,AD:SOU
ND 1,410,AD
1220 GOTO 270
1230 SCREEN 1,1:CLS
1240 CURSOR 9,1:PRINT "*INSTUCTIONS*"
1250 CURSOR 9,2:PRINT "(GRAPHICS,SHIFT
+B)*14)"
1260 CURSOR 0,4:PRINT "OBJECT OF GAME
:-"
1270 CURSOR 16,4:PRINT "TO SHOOT DOWN
INVADING"
1280 CURSOR 0,5:PRINT "(GRAPHICS,SHIFT
+B)*14) LETTERS AND NUMBERS."
1290 CURSOR 0,7:PRINT "THIS IS DONE BY
 PRESSING THE KEY OF"
1300 CURSOR 0,9:PRINT "THE LETTER OR N
UMBER OF THE CHARACTER"
1310 CURSOR 0,11:PRINT "FLYING ACROSS
THE SCREEN "
1320 CURSOR 2,13:PRINT "WHEN ASKED TO
INPUT PLAYING LEVEL"
1330 CURSOR 0,15:PRINT "IT IS AS FOLLO
WS :-"
1340 CURSOR 0,17:PRINT "THE HIGHER THE
 LEVEL THE FASTER THE"
1350 CURSOR 0,19:PRINT "CHARACTERS MOV
E ACROSS THE SCREEN "
1360 CURSOR 2,22:PRINT "PRESS ANY KEY
TO START."
1370 A$=INKEY$
1380 IF A$="" THEN 1370
1390 RETURN
1400 DATA 12,166,25,159,25,159,35,174,
35,174,42,168,42,168, 49,177
```

```
162,211,162,222,143,222,143,230,169
1460 DATA 230,169,243,152,243,152,247,
159,247,159,247,185,8,140,12,166
1470 DATA 8,140,8,185,8,185,247,185,24
7,185,247,185
1480 FOR I=1 TO 30:READ X1,Y1,X2,Y2:LI
NE(X1,Y1)-(X2,Y2),12:NEXT I
1490 PAINT(9,184),12
1500 RETURN
```

```
1410 DATA 49,177,60,156,60,156,69,179,
69,179,74,164
1420 DATA 74,164,85,177,85,177,93,164,
93,164,104,179,104,179,107,173
1430 DATA 107,173,145,173,145,173,148,
177,148,177,161,159,161,159,165,162
1440 DATA 165,162,172,150,172,150,183,
174,183,174,191,166,191,166,194,168
1450 DATA 194,168,200,149,200,149,211,
```

JR100V

NIM

M. K. Moffatt

GLENFIELD

The program will run on practically any machine as the program is straight BASIC. Instructions are in the program.

```
5 REM NIM BY MURRAY MOFFATT
10 CLS
20 LET M=17
25 PRINT "DO YOU WANT INSTRUCTIONS (Y/N)"
30 INPUT Q$
40 IF Q$="N" THEN 90
50 PRINT
60 PRINT "IMAGINE THERE ARE 17 MATCHES"
70 PRINT "AND YOU CAN CHOOSE 1,2 OR 3 AT"
75 PRINT "EACH GO. THE OBJECT IS NOT TO"
80 PRINT "BE LEFT TAKING THE LAST MATCH"
90 LET K=0
95 PRINT
100 LET K=K+1
110 IF K=5 THEN 180
120 PRINT "HOW MANY MATCHES DO YOU WANT"
125 PRINT "THIS IS ATTEMPT";K
130 INPUT J
135 LET M=M-J
140 LET C=4-J
150 PRINT "OK I CHOOSE";C
155 LET M=M-C
160 PRINT "THERE ARE";M;" MATCHES LEFT"
170 GOTO 100
180 PRINT "YOU LOSE"
190 END
```

SPECTRUM

Line Re-number

James Palmer

DUNEDIN

Line Re-number was written on a 48K Spectrum, but I see no reason why it shouldn't work on the 16K model. Great care must be taken when entering the program, as even an extra space would stop it working properly. Goto's and Gosub's are not changed.
To use type 'Goto 9000.'

```
9010 INPUT "Starting Line Number
 ";y
9020 INPUT "Incrementation ";x
9030 LET a=PEEK 23635+256*PEEK 2
3636
9040 LET b=PEEK 23627+256*PEEK 2
3628 - LET b=b-353
9045 IF a=b THEN STOP
9050 POKE a,INT (y/256): POKE a+
1,y-256*INT (y/256)
9060 LET a=a+2: LET c=PEEK (a)+2
56*PEEK (a+1)
9065 LET a=a+2
9070 LET a=a+c: LET y=y+x: IF a<
b THEN GO TO 9050
9080 PRINT "Renumber Complete"
```

VIC 20

(UNEX)
GHOST MAZE
P. HANSEN

This game is a maze that you are put in if in a random place you can only see right in front of you the maze walls are . you are . The object of the game is to get to spots marked in as less moves as you can, but watch out for the ghosts marked if you get too close to them you will get zapped off to another place in the maze. The game is a bit hard to get used to because you move forward with x turn right (90°) with m and left (90°) with n. Even though you move, you don't really move – the maze moves around you. You can have fun putting more sound in changing colours and graphic characters so here is the program:

```
5 POKE 36879,28
10 DIM E(70)
20 DIM V$(4,3)
30 DIM F(3)
40 W$=""
50 W$=W$+"0000000000"
60 W$=W$+"0111100110"
70 W$=W$+"0010011100"
80 W$=W$+"0011010110"
90 W$=W$+"0110100100"
100 W$=W$+"0011111100"
110 W$=W$+"0000009000"
120 FORI=1TO70
130 E(I)=VAL(MID$(W$,I,1))
140 NEXTI
150 S=-1
160 G=0
170 X=INT(RND(1)*50)+10
180 IFE(X)<>1THEN GOTO170
190 GOSUB860
200 D=INT(RND(1)*4)+1
210 IFX=G+10ORX=G-10THEN GOTO170
220 IFX=G+1ORX=G-1THEN GOTO170
230 H=H+1
240 IFH=5THEN GOSUB860
250 GOSUB390
260 GETA$
270 IFA$=""THEN GOTO260
280 IFA$="M"THEND=D+1
290 IFA$="N"THEND=D-1
300 IFD=5THEND=1
310 IFD=0THEND=4
320 IFA$<>"X"THEN GOTO210
330 IFD=1ANDE(X-10)<>0THENX=X-10
340 IFD=3ANDE(X+10)<>0THENX=X+10
350 IFD=2ANDE(X+1)<>0THENX=X+1
360 IFD=4ANDE(X-1)<>0THENX=X-1
370 IFE(X)=9THENGOTO930
380 GOTO210
390 FORI=1TO4
400 T=I-1
410 ONDGOTO420,460,500,540
420 F(1)=X-10*T+1
430 F(2)=X-10*T
440 F(3)=X-10*T-1
450 GOTO570
460 F(1)=X+10+T
470 F(2)=X+T
480 F(3)=X-10+T
490 GOTO570
500 F(1)=X+10*T-1
510 F(2)=X+10*T
520 F(3)=X+10*T+1
530 GOTO570
540 F(1)=X-T-10
550 F(2)=X-T
560 F(3)=X-T+10
570 FORJ=1TO3
580 IFF(J)<10RF(J)>69THENGOTO840
590 IFE(F(J))=0THENV$(I,J)="▒"
600 IFE(F(J))=1THENV$(I,J)=" "
610 IFE(F(J))=9THENV$(I,J)="*"
620 IFE(F(J))=2THENV$(I,J)="↑"
630 NEXTJ
640 NEXTI
650 V$(1,2)="↑"
660 PRINT"J"
670 PRINT
680 PRINT"****GHOST MAZE****"
690 PRINT
700 PRINT"FORWARD X"
710 PRINT"TURN RIGHT M"
720 PRINT"TURN LEFT N"
730 FORI=1TO5
740 PRINT
750 NEXTI
760 FORI=4TO1STEP-1
770 P$=" "
780 FORJ=3TO1STEP-1
790 P$=P$+V$(I,J)
800 NEXTJ
810 PRINTTAB(7);P$
820 NEXTI
830 RETURN
840 V$(I,J)="▒"
850 GOTO630
860 E(G)=1
870 G=INT(RND(1)*50)+10
880 IFE(G)<>1THENGOTO870
890 E(G)=2
900 H=0
910 S=S+1
920 RETURN
930 PRINT"YOU'VE ESCAPED"
931 POKE36878,15
932 FORL=1TO100
933 POKE36876,INT(RND(1)*128)+128
934 FORM=1TO10
935 NEXTM:NEXTL
936 POKE36878,0
937 POKE36876,0
940 PRINT"IN";S*5+H"MOVES"
```

ZX81 16K

Moon Patrol

SHAYNE BURBERY
GLEN EDEN
AUCKLAND 7

PROGRAM MAP

Line(s)	Routine		
1	Machine Code	6500 to 6590	Title
2 to 240	Variables	7000 to 7180	Set up screen
570 to 800	Stage 1	7500 to 7600	Jump
820 to 1110	Stage 2	8000 to 8010	Shoot
2010 to 2270	Stage 3	8500 to 8600	Bonus
4500 to 5030	Crash spaceship	9000 to 9230	Game Over
5500 to 5990	Special bonus	9500 to 9990	Instructions
6000 to 6300	You crash		

All grey characters are Graphics shifted H.

KEYS USED

1 to 5 Jump	6 to 0 Shoot
Q to T Back	Y to P Forward

```
   1 REM E£RND"L [illegible] FAST SGN Y[illegible]77
<" 3  GOSUB [illegible]<X4 POKE TAN
   2 LET C=PEEK 16396+256*PEEK 1
6397
  10 LET J=1000
  20 LET E$="[illegible]"
  30 LET L=3
  40 LET K=0
  50 LET B=1
  60 DIM A$(2,4)
  70 DIM B$(4,4)
  80 DIM C$(2,3)
  90 DIM D$(2,2)
 100 DIM F$(4,3)
 110 LET A$(1)="[illegible]"
 120 LET A$(2)="[illegible]"
 130 LET B$(1)="[illegible]"
 140 LET B$(2)="[illegible]"
 150 LET B$(3)="[illegible]"
 160 LET B$(4)="[illegible]"
 170 LET C$(1)="[illegible]"
 180 LET C$(2)="[illegible]"
 190 LET D$(1)="[illegible]"
 200 LET D$(2)="[illegible]"
 210 LET F$(1)="[illegible]"
 220 LET F$(2)="[illegible]"
 230 LET F$(3)="[illegible]"
 240 LET F$(4)="[illegible]"
 400 GOSUB 6500
 410 GOSUB 9500
 500 GOSUB 7000
 510 LET Z=1
 550 FOR F=1 TO 200
 560 IF F>1 THEN GOTO 580
 570 GOSUB 5000
 580 PRINT AT X,Y;"[illegible]";AT 18,2
6;A$(Z) AND F/7=INT (F/7) AND RN
D>M/10;AT 17,26;B$(INT (RND*2+1)
) AND F/10=INT (F/10) AND RND>M/
10;TAB USR 16514;AT 1,1+F/10;"[illegible]"
 590 PRINT AT G-1,H-1;"[illegible]";AT
 G,H;K$
 600 LET G=G+1
 610 LET H=H+1
 620 IF G=17 THEN GOSUB 4500
 630 LET D=PEEK 16421
 635 IF D=255 THEN GOTO 700
 636 PRINT AT X,Y;"[illegible]"
 640 LET Y=Y+(D=223 AND Y<10)-(D
=251 AND Y>3)
 650 IF D=247 THEN GOSUB 7500
 660 IF D=239 THEN GOSUB 8000
 700 IF PEEK (C+X*33+Y+4)<>128 T
HEN GOTO 6000
 710 IF PEEK (C+X*33+Y+37)<>136
THEN GOTO 6000
 720 LET K=K+2
 800 NEXT F
 810 GOSUB 8500
 820 GOSUB 7000
 830 LET M=M-2
1000 FOR F=1 TO 200
1005 PRINT AT 1,1+F/10;"[illegible]"
1010 PRINT AT X,Y;"[illegible]";AT 17,2
8;D$(INT (RND*2+1)) AND F/6=INT
(F/6) AND RND>M/10;TAB USR 16514
1020 LET D=PEEK 16421
1030 IF D=255 THEN GOTO 1090
1040 PRINT AT X,Y;"[illegible]"
1050 LET Y=Y+(D=223 AND Y<10)-(D
=251 AND Y>3)
1060 IF D=247 THEN GOSUB 7500
1090 IF PEEK (C+X*33+Y+4)<>128 T
HEN GOTO 6000
1100 LET K=K+3
1105 PRINT AT 17,26;"[illegible]" AND RN
D>.99
1110 NEXT F
2000 GOSUB 8500
2010 GOSUB 7000
2015 LET M=M+2
2020 FOR F=1 TO 200
2025 PRINT AT 1,1+F/10;"[illegible]"
2030 IF F>1 THEN GOTO 2050
2040 GOSUB 5000
2050 PRINT AT X,Y;"[illegible]";AT 17,2
6;B$(INT (RND*4+1)) AND F/14=INT
 F/14 AND RND>M/10;AT 18,26;A$(I
NT (RND*2+1)) AND F/8=INT (F/8)
AND RND>M/10;TAB USR 16514
2060 LET D=PEEK 16421
2070 IF D=255 THEN GOTO 2200
2080 PRINT AT X,Y;"[illegible]"
2090 IF D=247 THEN GOSUB 7500
2100 IF D=239 THEN GOSUB 8000
2110 LET Y=Y+(D=223 AND Y<10)-(D
=251 AND Y>3)
2200 IF PEEK (C+X*33+Y+4)<>128 T
HEN GOTO 6000
2210 IF PEEK (C+X*33+Y+37)<>136
THEN GOTO 6000
2220 LET G=G+1
2230 LET H=H+1
2240 PRINT AT G-1,H-1;"[illegible]";AT
 G,H;K$
2250 IF G=17 THEN GOSUB 4500
2260 LET K=K+4
2270 NEXT F
3000 GOSUB 5500
3010 GOTO 500
4500 PRINT AT G-1,H-1;"[illegible]";AT
 G+1,H;C$(INT (RND*2+1))
5000 LET G=3
5010 LET H=INT (RND*10+5)
5020 LET K$=F$(INT (RND*4+1))
5030 RETURN
5500 FOR I=0 TO 21
5510 PRINT AT I,0;"[illegible]"
5520 NEXT I
5530 PRINT AT 1,4;"[illegible]";B;"[illegible]";AT 3,4;"[illegible]";L;AT
5,4;"[illegible]";K;AT 7,4;"[illegible]";J;AT 9,4;"[illegible]";E$;AT 11,4;"[illegible]";2000*B;AT 13,4;"[illegible]";AT 15,4;"[illegible]"
5540 LET L=L+1
5545 LET B=B+1
5550 PRINT AT 3,4;"[illegible]";L
5560 FOR E=1 TO 10*B
5570 LET K=K+200
5580 PRINT AT 5,4;"[illegible]";K
5590 NEXT E
5600 LET M=M-1
5610 FOR E=1 TO 20
5620 NEXT E
```

```
5990 RETURN
6005 LET T=-1
6006 LET U=X
6007 LET V=Y
6008 GOSUB 6200
6010 FOR F=0 TO 19
6030 PRINT AT X,Y+F;"O";AT X,Y+F
;
6040 LET X=X+T
6050 IF X<=12 THEN LET T=1
6060 IF X>=17 THEN LET T=-1
6070 LET X=X+T
6075 PRINT "▒"
6076 PRINT AT X,RND*9+V-3;CHR$ I
NT (RND*7)
6077 PRINT AT X-1,V-2+RND*9;CHR$
 INT (RND*8)
6080 NEXT F
6100 LET L=L-1
6110 IF L=0 THEN GOTO 9000
6111 FOR E=1 TO 15
6112 NEXT E
6120 CLS
6130 IF B=1 OR (B-1)/3=INT ((B-1
)/3) THEN GOTO 500
6135 IF B=2 OR (B-2)/3=INT ((B-2
)/3) THEN GOTO 620
6140 GOTO 2010
6200 PRINT AT X,Y-2;"▒    ▒▒ ▒";
AT X-1,Y-3;"▒▒  ..▒▒  ▒";AT X-2,Y-3
;"▒▒  ▒▒  ▒";AT X-3,Y-3;"▒▒▒▒ ▒▒"
6300 RETURN
6490 RETURN
6500 CLS
6505 PRINT AT 5,0;"PATROL MOON"
6515 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒";TAB 6;"BY S.B.BURB
ERY"
6517 FOR E=1 TO 100
6520 NEXT E
6590 RETURN
7000 CLS
7010 FOR I=0 TO 17
7020 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
7030 NEXT I
7040 FOR I=18 TO 21
7050 PRINT "▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
7060 NEXT I
7070 PRINT AT 0,0;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
7080 FOR I=1 TO 5
7090 PRINT AT I,0;"▒";AT I,31;"▒
"
7100 NEXT I
7110 PRINT AT 6,0;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
7120 PRINT AT 1,1;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒DISTANCE"
7130 PRINT AT 3,1;"HI SCORE";J;
AT 4,1;"BY";E$;AT 3,20;"▒▒▒▒"
;L;AT 4,20;"COURSE";B
7140 PRINT AT 18,0;"▒OO=▒▒";AT 1
7,0;"▒▒▒"
7150 LET X=17
7160 LET Y=6
7170 PRINT AT X,Y;"▒▒▒";AT 19,5
;"COURSE";B;"▒▒"
7180 RETURN
7500 RAND USR 16514
7505 RAND USR 16514
7510 PRINT AT X-1,Y;"▒▒▒";TAB US
R 16514;AT X-1,Y;"▒▒▒";TAB USR 1
6514;AT X-2,Y;"▒▒▒";TAB USR 1651
4;AT X-2,Y;"▒▒▒";AT X-1,Y;"▒▒▒";
TAB USR 16514;AT X-1,Y;"▒▒▒";TAB
 USR 16514 AND Y>6
7520 FOR E=0 TO 3
7530 IF PEEK (C+X*33+Y+1+E)<>128
 THEN GOTO 6000
7540 NEXT E
7545 RAND USR 16514
7550 FOR E=0 TO 1
7560 IF PEEK (C+X*33+Y+34+E)<>13
6 THEN GOTO 6000
7570 NEXT E
7600 RETURN
8000 PRINT AT X,Y;"▒▒ ▒▒▒▒";AT
 X,Y+3;"▒▒▒▒"
8010 RETURN
8500 FOR E=1 TO 100
8510 PRINT AT 10,5;"▒▒▒▒▒"
8520 NEXT E
8530 FOR I=0 TO 21
8540 PRINT AT I,0;"▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
8550 NEXT I
8560 PRINT AT 1,4;"COURSE";B;"▒
COMPLETED";AT 3,4;"▒▒▒▒▒";L;AT
 5,4;"SCORE";K;AT 7,4;"BONUS";
1000*B
8565 PRINT AT 9,4;"HI SCORE";J;
AT 11,4;"BY";E$;AT 15,4;"▒▒▒▒▒
▒NEXT COURSE"
8570 FOR E=1 TO 5*B
8575 LET K=K+200
8576 PRINT AT 5,4;"SCORE";K
8580 NEXT E
8590 FOR E=1 TO 20
8592 NEXT E
8595 LET B=B+1
8597 CLS
8600 RETURN
9000 PRINT AT 10,4;"GAME OVER";A
T 12,4;"SCORE";K
9001 IF K>J THEN LET J=K
9002 IF K=J THEN PRINT AT 15,4;"
▒▒▒▒▒▒▒▒▒▒"
9003 IF K=J THEN INPUT E$
9004 IF LEN E$>10 THEN GOTO 9003
9005 PRINT AT 20,4;"ANOTHER GAME
?"
9006 PRINT AT 15,4;"▒▒▒▒▒▒▒▒▒▒▒▒"
9015 IF INKEY$="Y" THEN GOTO 920
0
9020 IF INKEY$="N" THEN GOTO 30
9030 GOTO 9010
9200 LET X=0
9210 LET L=3
9220 LET B=1
9230 GOTO 500
9500 CLS
9510 PRINT ,,"         MOON PATROL
"
9515 PRINT "KEYS",,"1 TO 5=JUMP"
,"6 TO 0=SHOOT","Q TO T=LEFT","Y
 TO P=RIGHT"
9520 PRINT ,,"     JUMP OVER THE
CRATERS AND   THE MINES WHILE SH
OOTING ROCKS. THE CLOSER TO THE
RIGHT YOU GO   THE GREATER DISTAN
CE YOU CAN     JUMP.WATCH OUT FOR
 THE ALIEN     SPACE SHIPS."
9600 PRINT ,,,,,,,"▒▒▒▒▒▒▒▒▒▒▒▒▒▒
▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒▒"
9610 IF INKEY$<"1" OR INKEY$>"6"
 THEN GOTO 9610
9700 LET M=VAL INKEY$
9800 LET M=M+2
9990 RETURN
```

VIC20

Find and Merge

Grant Drake
NORTHCOTE

This program is both a "Find" and "Merge" program — the "Find" routine will locate any variable, letter or word in a program — e.g. if searching for statement GOTO 10, it will also find (if there is one) GOTO 100, since it contains GOTO 10 in its line. Further instructions are in the program, as well as for the "merge" routine. This routine is very simple, and "stacks" the programs on top of each other. Both routines will stay in the computer until it is reset by SYS64824 or SYS64802 or it is switched off.

```
1 POKE36879,125:PRINT"'FIND' UTILITY":PRINT"------- -------"
2 PRINT"THIS PROGRAM IS USED TO FIND ANY VARIABLES WORDS OR STATEMENTS"
3 PRINT"IN A PROGRAM LISTING.
4 PRINT"ALL YOU HAVE TO DO   IS CREATE A LINE THAT IS THE FIRST IN A      PR
OGRAM -";
5 PRINT" LIKE THIS"
6 PRINT"LINE NO.  VAR/WOR/STA"
7 PRINT"PRESS ANY KEY";
8 POKE198,0:WAIT198,1
9 PRINT"'FIND' UTILITY":PRINT"------- -------"
10 PRINT"EG. 1 SC  OR  1 HULLO"
11 PRINT"AND THEN TYPE"
12 PRINT"SYS 673
13 PRINT"A LIST OF NUMBERS    WILL APPEAR WHICH ARE THE LINE NUMBERS THAT 
YOUR ";
14 PRINT"(VAR/WOR/STA) IS IN.THE LINE YOU MADE  CAN THEN BE DELETED."
15 PRINT"PRESS ANY KEY";
16 POKE198,0:WAIT198,1
17 PRINT"'MERGE' UTILITY":PRINT"------- -------"
18 PRINT"THIS IS USED TO MERGETWO BASIC PROGRAMS    TOGETHER.HOWEVER,THERE
";
19 PRINT"ARE CERTAIN LIMITS:":PRINT"1 THE PROGRAM MUST     BE TOTALLY BASIC.
"
20 PRINT"2 THE SECOND PROGRAM   MUST HAVE HIGHER      LINE NUMBERS THAN"
21 PRINT"THE FIRST.";
22 POKE198,0:WAIT198,1:POKE198,0
23 PRINT"'MERGE' UTILITY":PRINT"------- -------"
24 PRINT"HAVE THE PROGRAM WITHTHE LOWER LINE NUMBERSIN MEMORY AND THEN"
25 PRINT"TYPE SYS 560":PRINT"NEXT LOAD THE SECOND PART OF THE PROGRAM   
AND TYPE SYS 580
26 PRINT"THE NEW PROGRAM CAN  NOW BE LISTED OR SAVED
27 PRINT"PRESS ANY KEY";:POKE198,0:WAIT198,1:POKE198,.
28 PRINT" LOADING MACHINE CODE ":PRINT"FOR 'FIND' ROUTINE"
29 S=PEEK(43)+256*PEEK(44)+4:H=INT(S/256):L=S-256*H
30 FORA=680TO764:READB
31 IFB=999THENPOKEA,L:A=A+1:POKEA,H:GOTO33
32 POKEA,B
33 NEXTA
34 PRINT" LOADING MACHINE CODE ":PRINT"FOR 'MERGE' UTILITY"
35 FORC=560TO591:READD:POKEI,D:NEXT
36 PRINT"THESE ROUTINES WILL  STAY IN MEMORY UNTIL  THE COMPUTER IS TURNED
OFF."
37 END
38 REM
39 REM **************
40 REM *FIND ROUTINE*
41 REM **************
42 REM
43 DATA234,166,43,134,0,166,44,134,1,160,3,200,177,,205,999,240,26,201,,208,244,
160,
44 DATA177,,133,2,200,177,,133,1,165,2,133,,5,1,201,,208,221,96,132,2,162,,232,2
00,189
45 DATA999,201,240,6,209,,240,243,208,16,160,2,177,,170,200,177,,32,205,221,169
46 DATA 32,32,210,255,164,2,184,80,182,234
47 REM
48 REM***************
49 REM*MERGE ROUTINE*
50 REM***************
51 REM
52 DATA165,43,166,44,133,251,134,252,166,45,202,202,134,43,166,46,134,44,96
53 DATA234,234,234,165,251,133,43,165,252,133,44,96,0
```

SEGA

Sprite Pattern Generator

Stuart McLachlan
NAPIER

This program allows the user to draft a sprite shape and obtain a pattern statement for it. It can then be displayed on the graphics screen and then modified if required. The instructions to operate the program are contained in it. No doubt many readers will wish to leave out the REM statements to save time, the program will run without them, but I would advise anyone doing so to make a note of the remarks in lines 40 and 50.

At the end of the listing is a sample of the printout obtained for a sample sprite when a printer is attached and line 510 is amended in accordance with line 50.

```
10 REM.SPRITE PATTERN GENERATOR
20 REM.BY STUART MCLACHLAN.JAN1983
30 REM.Program to draw sprite using bl
ock graphics and then convert to patte
rn statements
40 REM. For Mag1/3 graphics.If using
mag0/2 then only use top left quadrant
 of drawing area.
50 REM.If printer attached,insert :4CO
PY at end of Line No 510
60 REM Variables:LOOP COUNTERS(A,B);CU
RSOR LOCATIONS(X,Y);JOYSTICK(S);TRIGGE
R(T);SUBSCRIPT VALUES(E,F)
70 REM START OF TEXT VRAM(D);VALUE OF
BLOCK LOCATION(VP);DEC VALUE OF BLOCK
GROUP(P);HEX VALUE OF BLOCK GROUP(P$)
80 REM Instructions Display
90 CLS: PRINT "SPRITE PATTERN GENERATO
R"
100 PRINT "                              "
110 PRINT:PRINT"USE THE JOYSTICK TO DR
AW A SPRITE."
120 PRINT"THE LEFT HAND BUTTON ERASES
BLOCKS AND SHOWS THE CURSOR LOCATION"
130 PRINT "WHEN YOU ARE HAPPY WITH YOU
R DESIGN,"
140 PRINT "PUSH THE RIGHT HAND BUTTON.
"
150 PRINT "AFTER A PAUSE, THE FOUR PAT
TERN CODES FOR YOUR SPRITE WILL BE PRI
NTED"
160 PRINT "IT WILL TAKE ABOUT 20 SECON
DS"
170 PRINT
180 PRINT "PRESS ANY KEY TO START"
190 IF INKEY$=""THEN190
200 REM Sprite Drawing
210 DIMP(3,16):DIMP$(3,16):DIMVP(15)
220 CLS
225 CONSOLE0,24
230 S=STICK(1):T=STRIG(1)
240 X=X-(S>1ANDS<5)+(S>5ANDS<9)
250 Y=Y-(S>3ANDS<7)+(S=1ORS=2ORS=8)
260 IFX<0THENX=0
270 IFY<0THENY=0
280 IFX>15THENX=15
290 IFY>15THENY=15
300 CURSORX,Y:PRINT" "
310 IFT=1THENCURSORX,Y:PRINT " "
320 IFT>1THENBEEP:CURSOR0,22:PRINT "WA
IT WHILE I CALCULATE":GOTO 350
330 GOTO 230
340 REM Loops to read desired blocks
350 D=&H3C02:E=0:F=0
360 FORA=0TO280STEP40:GOSUB 610
370 F=F+2: NEXTA:E=1:F=0
380 FORA=320TO600STEP40:GOSUB 610
390 F=F+2: NEXTA:E=2:F=0
400 FORA=0TO280STEP40:GOSUB 700
410 F=F+2:NEXTA:E=3:F=0
420 FORA=320TO600STEP40:GOSUB 700
430 F=F+2: NEXTA
440 REM Convert groups from dec to hex

450 FORA=0TO3:A$(A)="":FORB=0TO15
460 P$(A,B)=HEX$(P(A,B)):A$(A)=A$(A)+P
$(A,B):NEXTB:NEXTA
470 REM Print hex codes
480 CURSOR0,17
490 FORA=0TO3:FORB=0TO15
500 PRINT P$(A,B);
510 NEXTB:PRINT:NEXTA
515 FORA=0TO3:PATTERNS#A,A$(A):NEXT
520 CURSOR17,0:PRINT"1  END"
530 CURSOR17,1:PRINT"2  REDRAW"
540 CURSOR17,2:PRINT "3  NEW SPRITE"
545 CURSOR17,3:PRINT "4  DISPLAY SPRIT
E"
550 CONSOLE21,3,:CLS
560 CURSOR0,23:INPUT"SELECT NUMBER";A
570 IFA>4ORA<1THEN550
590 ONAGOTO770, 225,220,780
600 REM Reads blocks 0 and 1 in binary

610 FORB=0TO7:VP(B)=VPEEK(D+A+B)
620 IFVP(B)=229ORVP(B)=42THENVP(B)=1:V
POKE(D+A+B),42:GOTO 640
630 VP(B)=0
640 NEXTB
650 REM Converts binary to dec
```

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```
660 P(E,F)=(VP(0)*8)+(VP(1)*4)+(VP(1)*
2)+VP(3)
670 P(E,F+1)=(VP(4)*8)+(VP(5)*4)+(VP(6
)*2)+VP(7)
680 RETURN
690 REM Reads blocks 2 and 3
700 FORB=8TO15:VP(B)=VPEEK(D+A+B)
710 IFVP(B)=229ORVP(B)=42THENVP(B)=1:V
POKE(D+A+B),42:GOTO 730
720 VP(B)=0
730 NEXTB
740 P(E,F)=(VP(8)*8)+(VP(9)*4)+(VP(10)
*2)+VP(11)
750 P(E,F+1)=(VP(12)*8)+(VP(13)*4)+(VP
(14)*2)+VP(15)
760 RETURN
770 CLS:END
780 SCREEN 2,2:CLS :MAG1
790 SPRITE0,(100,95),0,1
795 FORA=1TO1000:NEXT
796 MAG3:FORA=1TO1000:NEXT
800 SCREEN 1,1:GOTO560
```

```
  **          **
  **          **
  ************
   **********
   **    *    **
   **    *    **
   **********
    *********
    ***    ***
    ***    ***
     *******
      *****
```

```
0018181F0F0C0C0F
0707070301000000
000303FFFE4646FE
FC1C1CF8F0000000

WAIT WHILE I CALCULATE
```

SPECTRUM

Times Table

Richard Ingram
BIRKENHEAD

This program is intended to teach Times Tables.

The program has all the instructions needed. It is best to save the program with "Save 'Name' Line 1." This can be used with any program and auto runs it once loaded.

```
  1 BORDER 7: CLS
 10 PRINT AT 0,13;"M E N U"
 20 PRINT '''1  Display times t
ables"
 30 PRINT ''"2  Test on any tab
les"
 40 PRINT ''"3  Test on a parti
cular table"
 42 PRINT ''" PRESSING "M" WILL
 RETURN YOU   TO THE MAIN MENU"
 45 PAUSE 0
 50 LET a$=INKEY$
 60 IF a$="2" THEN GO TO 1000
 70 IF a$="3" THEN CLS : GO TO
2000
 80 INPUT "Please enter the tim
es table youwish to learn ";t
 85 CLS
 87 PRINT AT 0,9;t;" times tabl
e"
 88 PRINT ''
 90 FOR f=0 TO 12
100 PRINT f;" x ";t;" = ";f*t
110 NEXT f
120 IF INKEY$="m" THEN RUN
130 PRINT AT 21,0;"Press "A" to
 enter another table"
140 IF INKEY$="a" THEN GO TO 80
150 GO TO 120
1000 PRINT AT 0,0;"Test on the t
imes tables"
1005 CLS
1010 LET a=INT (RND*13)
1020 LET b=INT (RND*13)
1025 IF INKEY$="m" THEN RUN
1030 PRINT AT 10,9;a;" x ";b;" =
 "
1040 INPUT "Please enter your gu
ess ";g
1050 IF g=a*b THEN GO SUB 9000
1051 PRINT AT 10,21;a*b
1052 IF g=a*b THEN GO TO 1063
1055 FOR f=0 TO -20 STEP -1: BEE
P .02,f: NEXT f
1060 PRINT AT 17,0;"Sorry that i
s WRONG. The correct answer is "
;a*b
1061 PRINT AT 10,21;a*b
1063 PAUSE 0
1065 IF INKEY$="m" THEN RUN
1070 GO TO 1000
2000 PRINT AT 0,6;"Test on a par
ticular times table"
2010 INPUT "Please enter the tab
le you wish to be tested on ";t
2020 LET a=INT (RND*13)
2025 IF INKEY$="m" THEN RUN
2030 CLS
2040 PRINT AT 10,10;a;" x ";t;"
 = ";
2050 INPUT "Please enter your gu
ess ";g
2055 IF INKEY$="m" THEN RUN
2060 IF g=a*t THEN GO SUB 9000
2065 IF g=a*t THEN GO TO 2020
2070 FOR f=1 TO -20 STEP -1: BEE
P .01,f: NEXT f: PRINT AT 15,0;"
Sorry that is WRONG. The correct
 answer is ";a*t
2080 PAUSE 0: GO TO 2020
9000 FOR f=1 TO 30: BORDER INT (
RND*8): BEEP .01,f: NEXT f
9010 PRINT AT 5,10; FLASH 1;"Cor
rect": PAUSE 0: RETURN
```

VIC20

Defender

Tim Davey
PORIRUA

This is a program for the Unexpanded VIC20. It is a type of defender scene. It asks for a speed at which to move a ship, 1 being the slowest. It can easily be made to work on the Commodore 64.

```
1 POKE36879,24
2 PRINT"□"
5 INPUT"SPEED";D
7 PRINT"□"
10 PRINT">▛▀▙_"
15 FORK=1TO70
20 PRINT"▚▚ ▐▐▐"
30 POKE36878,15
40 POKE36877,220
50 FORT=1TOD:NEXT
60 NEXTK
70 POKE36877,0
100 PRINT"▚▚▚▚▚▚▚▚▚▚DEFENDER* ▛▀▙_"
110 PRINT"▚▚▚▚▚▚▝▀                    "
111 PRINT"▚▚▙_/\/\/\/\/\/\/\/\/\/\/\_"
112 PRINT"▚▚▚▝▀                      ▀"
115 FORT=1TO5000:NEXT
120 RUN
```

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The inauguration of the above-names club took place on March 21st at the VHF Clubrooms, Hazel Ave, Mt Roskill.
The organizers of the club were pleasantly surprised by a very large attendance and if the present trend continues, we may have to look for more spacious clubrooms.
The objects of the club are to help the owners of SpectraVideo and anyone interested in programing in MSX Basic.
The club will meet on the 3rd Wednesday of each month at 7.30 p.m. in the VHF clubrooms, Mt Roskill.

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VIC-20

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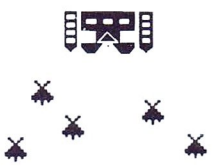

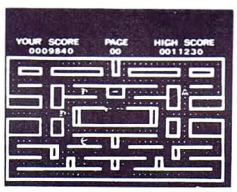

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REWARDS

If this letter is published it will be my third "Rewards" letter in consecutive issues of your magazine! I don't say this as something to be proud of, I would much prefer that such a column wasn't necessary in your magazine — although the $10 cheques are welcome! Suffice to say that I feel you have plenty of room for improvement.

Anyway, down to the error that I've spotted. It occurs in my machine code scroll program for the Commodore 64 that you included in the March '84 issue. Readers may have noticed an ominous looking gap at the bottom of page 35 following the notes about the program. As the first twenty lines of code in the program were missing, and as the gap seems just about enough for twenty lines, I can only presume that somebody at COMPUTER INPUT has been somewhat careless.

Anybody trying to run the program will have noticed that although it doesn't crash, "Example 8" just displays a few rows of very dull looking @ characters. This is because the dimensioning and initialisation of the arrays used in the example are in the missing lines. Also, any attempt to use the machine code in readers' own programs would have been hampered by the fact that the information required to use the machine code was also part of the missing code. Could you please include the missing lines in your April issue. One other very minor error is that in the notes accompanying the listing paragraph two should say ". . . just the screen characters or just the colours of both."

On program listing legibility I found that Bruce Brodie's program on Page 40 was too faded to read in several places and my own program on page 36 would definitely have benefitted from a better quality printer. It is important, especially in machine code programs, to have a very clear listing. Why couldn't both programs mentioned have been printed with a device such as that used for John Algar's program on Page 30. That was very clear — nothing should drop below that standard.

Frank Topp
WELLINGTON

An unfortunate mishap in the March issue. Also the photographs on Page 11 were completely missed out (as well as the begining of your program on Page 35).

Apparently, during the printing process, the film which carried both pieces of material was mislaid. Although we try to keep track of the production from go to whoa, there are some processes that are beyond our control.

Most other mistakes have, up to now, come from two sources: The first is typesetting. Proof-reading has straightened a lot out in the last few issues (as well as a new typesetter!). The second, unfortunately, we have very little control over. Print-outs & copy received from our readers. We have been completely astounded by people claiming rewards from programs which were sent "as is" to us.

Despite the excuses, we are contrinually trying to make sure the content of COMPUTER INPUT is accurate. Who knows? Maybe one day we may have an issue completely mistake-free!

ED.

I spotted a mistake in your March iss of COMPUTER INPUT.

Page 22, the article "The Sega and Machine Code" had an item missing from the data line. Line 50 should read:
50 DATA &HCA, &HOF, &HAO, &HCD, &HOO, &H24

The byte inserted is the MSB of the JPZ instruction.

Alan Telford
HASTINGS

I have spotted an error on Page 7 "Eric's Answers" under the Sega SC-3000 in line 90. It should be 90 GOTO 90.

Jeffrey McAlister
MT EDEN

I have found a mistake in the keyboard debounce program on Page 19 of the March issue. Line 10 reads "10 for X &HBFE0T0 &HBFF2. It should read 10 for X = &HBFE0T0 &HBFF2.

Alistair Webb
TE HANA

Sorry to gripe, but the C64 program on Page 40 of the March issue includes a couple of illegible numbers, in my copy anyway.

N. Woollaston
NELSON

In the listing of "Parachute" for the SEGA SC-3000 in the March issue, the end of line 90 reads "ON A GOTO 100, 110, 120" where actually there is no line 110 printed in the magazine.

Andrew Selby
WOODEND

I have discovered a mistake in the listing for the "Parachute" game in your March issue. It is that line 110 is missing. I assume it should be there because in line 90 there is a GOTO 110 statement. Looking forward to a reply.

T. Swain
CHRISTCHURCH

It appears Brian Brown did include a line 110 on his original listing, then, however, he "twinked" it out, leaving the gap between the lines and the reference in line 90. To rectify the situation, either delete the reference to line 110 in line 90, or add the following line.

```
110 IFZ<1THENZ=31
```

ED

Congratulations!
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COMPETITIONS

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ERROR COMPETITION

NO ONE FOUND IT!!

So our competition to find the deliberate error in COMPUTER INPUT continues. (Again **NOT** in the program listings).

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SEGA WINNER RECEIVES PRIZE

MR P. E. HUGHES the winner of the "Computer Input Is . . ." competition gets to grips with his new SEGA SC-3000 at COMPUTER INPUT.

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We continue this month with the Comp etitions Competition!! All you have to do is to tell us what kind of competiton's you'd like to see in Computer Input and what kind of prizes should be offered. The best ideas will be awarded "Computer Input" tee-shirts (also, should your idea for a competition be accepted – you won't be eligible to win it.)

PROGRAM OF THE MONTH

Each month a **Program of the Month** will be chosen from those received that month. This puts the author in the running for **Program of the Year**, the overall prize for which is yet to be announced (and guaranteed to be worthwhile).

Each program will be judged on graphics, sound, setting out, playing levels and so on. Obviously the computer used will be taken into account.

April '84 goes to **DEREK RICHARDS** of PAPAKURA for his "Thunderbird" program for the Commodore 64.

The "Program of the Year" entries so far are:

PETER McCARROLL, LOWER HUT — DEC '83.
PAT POLAND, TE AKAU — FEB '84.
PAUL BONNINGTON — MAR '84.
DEREK RICHARDS, PAPAKURA — APR '84.

By the looks of things, someone's going to have a brand new computer system next Christmas!!

BRAIN TEASER CROSSWORD

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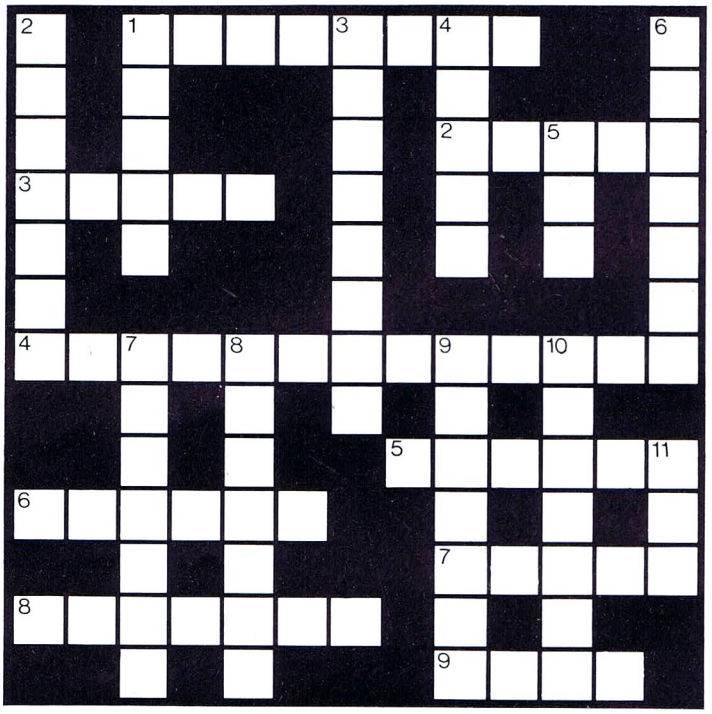

ACROSS

1 A command which moves cursor down one line or to move paper up (8)
2 Universal code (5)
3 Command to proceed to another line (5)
4 A small computer based on a microprocessor (13)
5 You won't see this on a black or white TV (6)
6 The part of the computer that stores information (6)
7 A representation of a command (5)
8 A device with which you can view the video output (7)
9 The Baud _____ is the speed at which the computer processes information (4)

DOWN

1 A command to get a print out (5)
2 What you type into the computer (7)
3 There are two types of these, mathematical and string (8)
4 To edit a mistake in a line (5)
5 Abreviation command to wipe the screen (3)
6 A device which gives you a hard copy (7)
7 Without _____ statements the computer doesn't know what to do (7)
8 You use the keyboard to _____ the computer (7)
9 Device which produces a hard copy of graphics (7)
10 Commands such as Renumber, Auto and Trace are common in a _____ (7)
11 Command to commence program (3)

Please, on any correspondence to "Computer Input" state exactly what section the material is intended for. i.e. BRAIN TEASER, TEE-SHIRT COMPETITION, CLUB PAGE, SPECTRUM INPUT ETC. We have received a number of programs and have not been sure whether they were for the software section or competition. So please designate clearly what your material is for.

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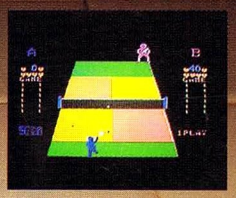

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