MICRO-80

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Also in this issue:

PROGRAMMING:
Peek, Poke and USR Statements Explained

REVIEWS:
The Adventure System
The TRS-80 MC-10 Computer

SOFTWARE:
HI-RES Text—Colour
Killer Satellite—Colour
Sirius Adventure—Colour
Track Racer—Peach
Galactic Battles—Level I
Track Racer—Peach
Sirius Adventure—Peach
Household Accounting—Peach
Yahtzee—Level 2
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CONTENTS

REGULARS
- EDITORIAL 2
- WHAT YOU HAVE MISSED 4
- INPUT/OUTPUT 13

DEPARTMENTS
- KALEIDOSCOPE (COLOUR COMP) 3
- PEACH BOWL (HITACHI PEACH) 3
- GROUP ONE (MODEL 1/SYSTEM 80) 3
- FORM THREE (MODEL 3) 4

PROGRAMMING
- MAKING USE OF PEEK, POKE & USR 5

REVIEWS
- THE ADVENTURE SYSTEM 10
- THE TRS-80 MC-10 COMPUTER 12

SOFTWARE

COLOUR COMPUTER
- HI-RES TEXT upper/lo 15 & 36
- THE KILLER SATELLITE 15 & 23
- SIRIUS ADVENTURE 18 & 24

PEACH
- TRACK RACER 15 & 38
- SIRIUS ADVENTURE 18 & 21
- HOUSEHOLD ACCOUNTING 16 & 19

TRS-80/SYSTEM 80
- AUSTRALIA'S CUP (L2/16K) 13 & 39
- YAHTZEE (L2/16K) 18 & 28
- BOLD TYPE FOR LP VII (L2/12K) 18 & 27
- LVAR (L2/32K) 15 & 44
- GRAFX (DISK 32K) 14 & 43
- SPACE UTILITY (DISK/48K) 18 & 27

OTHER
- SOURCE UTILITY (MOD3/DISK) 14 & 46
- HOUSEHOLD ACCOUNTING (MODEL 4) 16 & 31
- SPACE INVADERS (TRS-80 MC-10) 18 & 26
- NEXT MONTH'S ISSUE 47
- CASSETTE/DISK EDITION INDEX 48
- ORDER FORM 48

ABOUT MICRO-80

EDITOR: IAN VAGG

MICRO-80 is an international magazine devoted to the Tandy TRS-80 Model 1, Model III and Colour microcomputers, the Dick Smith System 80/Video Genie and the Hitachi Peach. It is available at the following prices:

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MICRO PROCESSOR SERVICES, 940A Columbo Street, CHRISTCHURCH 1 NZ. Ph. 62894

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HONG KONG/SINGAPORE	Aus$58.00	Aus$122.00	Aus$157.50
INDIA/JAPAN	Aus$64.00	Aus$129.00	Aus$165.00
USA/MIDDLE EAST/CANADA	Aus$73.00	Aus$140.00	Aus$177.00

Special bulk purchase rates are also available to computer shops etc. Please use the form in this issue to order your copy or subscription.

The purpose of MICRO-80 is to publish software and other information to help you get the most from your TRS-80, System 80/Video Genie or Peach and its peripherals. MICRO-80 is in no way connected with any of the Tandy, Dick Smith or Hitachi organisations.

WE WILL PAY YOU TO PUBLISH YOUR PROGRAMS: *Most of the information we publish is provided by our readers, to whom we pay royalties. An application form containing full details of how you can use your microcomputer to earn some extra income is included in every issue.*

CONTENT: *Each month we publish at least one applications program in BASIC for each of the microcomputers we support. We also publish Utility programs in BASIC and Machine Language. We publish articles on hardware modifications, constructional articles for useful peripherals, articles on programming techniques both in Assembly Language and BASIC, new product reviews for both hardware and software and we printer letters to the Editor.*

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EDITORIAL

Welcome to our new-look MICRO-80 magazine. We hope you find the new layout more readable than the old. For those interested in the mechanics of magazine production, our type setting is now being done on a Compugraphic 80 Electronic phototypesetting machine. This is effectively a multi-user computer/word processor which produces its output photographically. The equipment is pretty much state-of-the-art and is another product of the microprocessor revolution. Just in case you think we must have won the lottery, the type setting equipment is not ours but is the property of Formgraphic, a very progressive type setting house located nearby.

Quite apart from making the magazine easier to read, the new type setting fits double the amount of information on each page thus enabling us to reduce the paper used by almost 25% (the Listings still occupy the same space as before). So when future issues look a little slimmer, don't fret, you will still be receiving the same amount of information. The reduction in paper content is aimed at reducing the magazine's production costs. It is now 2 years since the price of MICRO-80 was last set. In that time, production costs have increased dramatically. Even with the reduction in material costs we have now effected, we must reluctantly increase the selling price of MICRO-80. The new rates which become effective immediately, are published on the index page. The price increase is modest and will enable us to continue to improve our magazine and adapt it to meet the changing requirements of our readers. Of course, you will not be required to pay the new rates until your subscription comes up for renewal. Incidentally, we do send Reminder Notices when your subscription nears its expiry date.

There have been several changes in key staff at MICRO-80. Ryzard Wiwatowski, the Editor for the past 12 months has resigned as has Charlie Bartlett, the Software Editor for the past 2½ years. Charlie is moving to sunny Queensland. I am sure we all wish both men well in their future careers. Ian Vagg has assumed the role of Editor once more whilst Ed Grigonis who operates a Model 1 system with disk drives and is an active member of the Adelaide Micro Users Group, has become Software Editor. The departure of Ryzard and Charlie caused no small disruption in our production schedule. The result is the issue you are reading now. It is a double-sized issue (after allowing for type setting) and encompasses both November and December 1983 editions. It is also rather late. The delayed production ran us slap-bang into the Christmas season and the subsequent annual close down of our printers. It will take a month or two until we are once more back on schedule so please accept our apologies for any inconvenience caused.

Much has been happening of late in the '80 field. Tandy has announced several new products including a portable Model 4 known as a Model 4P. This is essentially a Model 4 in a more compact package with 9" monitor, half-height disk drives and separate keyboard which all packs away into a large carrying case. The complete unit weighs in at about 12kg and with 2 disk drives and 64K of RAM sells in the U.S.A. for $US1,799.00. Since the 4P has not yet been announced in Australia its price here is unknown but will probably be $2,600-$2,700, now that the Model 4 itself has been reduced to $3,000. There seems little doubt that like radios and calculators before them, computers are going to become portable. The main impediment to this process is the bulk and weight of a readable sized display. Once flat screen or large liquid crystal displays become available at a suitable price the desk-top microcomputer as we know it today is certain to become a quaint relic of the past. The only question now seems to be, how quickly will it all happen?

On a less buoyant note, we have heard form a usually reliable source that EACA, the Hong Kong firm that manufactured System 80/Video Genie, has ceased trading altogether. This will mainly affect those System 80/Video Genie owners who are planning to upgrade their systems to include disk drives or a printer, since printer interfaces and expansion interfaces are no longer available. Fortunately, here at MICRO-80 we had already commenced design work on a new expansion interface and also a printer interface, when the news broke. The interfaces will be available for sale towards the end of February 1984. The expansion interface (there is also a TRS-80 version) includes a printer port, RS232 port, floppy disk controller and up to 32K of static RAM. The use of static RAM gives high noise immunity and removes many sensitive timing problems associated with the dynamic RAM used in the early designs. The printer interfact is decoded to both port FD (standard System 80/Video Genie printer port) and also to memory address 37E8H, the address used in the TRS-80 Model 1. In this way Tandy software which drives the printer port directly will operate satisfactorily on the System 80. The expansion interface has the same arrangements for its printer port, too.

The demise of EACA is somewhat symptomatic of the changes taking place in the '80 world. The proliferation of different brands of microcomputer, each more dazzling and spectacular than the last, has reduced the total amount of support available for any one brand. In particular, older machines such as the TRS-80/System 80 are suffering badly. There are many fewer organisation catering for these machines and even their original distributors Tandy and Dick Smith have markedly reduced their levels of support in favour of later models or different machines altogether. At the same time, these computers still have a good deal of useful life left in them and there are literally tens of thousands of owners who have a large personal investment in them through acquired knowlede and programs, both written and purchased. We believe that the TRS-80/System 80 computers are far from finished and it is time that owners drew together to assist each other even more as commercial support wanes. MICRO-80 intends to become an even more important focal point for this support. The development of new expansion interfaces for the TRS-80 and the System 80 and the distribution of Molymerx software in Australia are just two of the ways in which we have increased our support for the owners of '80 computers. MICRO-80 itself will also change to better reflect the interests of its readers. We will for the first time encourage the placement of advertisements for relevant products in our magazine. Rates will be much lower than in the general computing magazines so that small, specialist suppliers will be able to afford to advertise. We will shortly launch a New Products column containing information about relevant new products for '80 computers. In these ways, MICRO-80 will become a more complete reference to all things '80 and help maximise the diminishing support. While some of this may not be of great relevance to overseas readers we are sure that the changes in content which are planned will be very appealing.

Over the years we have received many comments from readers, both positive and negative. Analysis of these comments indicates that whilst the newer computer owners find the material in MICRO-80 to be pretty much what they want, the more experienced owners find fewer articles and programs to suit their tastes. One of the most consistent complaints is that we publish too many games (usually expressed by the disgruntled as, "All you publish is games"). There are two interesting observations to be made here. Firstly, we do publish many other types of programs besides games. Secondly, the programs we publish represent a fair cross-section of those being written (and presumably used) by Readers so we are probably catering to the "average" taste. That said, we accept that we do not publish many "Serious" programs in terms of relatively complex applications such as Accounting Systems, Data Management etc. Certainly, those of our critics who suggest we should publish full-featured working accounting systems for example, are being somewhat unreasonable. Such software sells for $2,000 or more. It seems a little much to expect to be given it for the price of a magazine subscription. The reason these programs cost so much is the very considerable amount of work, often amounting to man-years, required to write, test, debug and maintain them. Speaking personally, if it were my business at stake, I would make sure that I paid the full rate for a properly supported program because, when things go wrong I want them fixed quickly. Nevertheless, there is considerable scope to increase our coverage in the serious applications area. We will therefore, introduce a number of changes over the next few issues. Firstly, we will support two data base programs, the Tandy Profile series and ENbase from Southern Software. The first because they are useful programs that are very widely used, the second because we believe ENbase to be the most powerful data base available for the '80 computers. Our support will take the form of articles to assist you to understand the concepts behind the programs and how to get the best form them and also "Listings" of specific applications which you can use just as you would a BASIC program. We would welcome (and pay for!) submissions by our readers.

In a similar vein, we will support VISICALC and SUPER VISICALC with articles, templates etc.

We will publish more in-depth reviews of serious applications software such as word processors, graph generators, data bases etc. Games playing can also be a serious business for the real enthusiast so Ed Grigonis has undertaken to write a series of detailed reviews on many of the better quality games. Ed's first contribution on the Adventure System is in this issue from which you will see that he writes very high standard reviews indeed.

One of the more neglected fields in computer magazines of all kinds, is that of utilising the graphics capabalities of dot-matrix printers. The ubiquitious Epson

MX-80 has spawned a host of cheap compatibles in its wake. There seems to have been few articles published anywhere to assist the owner unravel the Jinglish in the instruction manuals, let alone make use of the extremely versatile bit-graphics capabilities of these printers. MICRO-80 will attempt to rectify these omissions by publishing articles, programs etc which will assist the very many owners of such printers to improve their usefulness.

Even with the increased emphasis on "Serious" computing planned, we will not neglect our less experienced readers and will continue to provide articles and programs to suit the new and intermediate owner.

We hope you will find reading our "New-Look" MICRO-80 as exciting and interesting as we find the prospect of producing it. We believe that, whatever your background and experience, each issue will contain something to interest and challenge you.

DEPARTMENTS KALEIDOSCOPE

A major drawback in using the high resolution screen on the Colour Computer is the difficulty encountered when you try to mix the text with the graphics. One way of solving this problem was presented in last month's issue, but the WRITER program in this issue by Geoffrey Williamson demonstrates a much more flexible and useful solution to the problem. Those of you with Tandy's Editor/Assembler Plus who wish to type in the source code from the magazine will notice that a 'few lines' have been left out between lines 1500 and 12,040. This omission is quite deliberate and in the interest of saving space — the source lines omitted are simply the multitude of FCB's that define the bytes of the character table and these can be just as easily read from the Hex Dump. For reference, source line 1410 corresponds to the Hex Dump at $30C0. For those of you entering the Hex Dump, the memory addresses commencing at $3000 are only a suggestion since you cannot place the code starting at zero in reserved RAM. However, the program is written in position independent code and you can locate the program anywhere you find it convenient.

WATCH BASIC AT WORK

Normally, the text video display memory on the Colour Computer is located at $400-$5FF. The actual values stored here determine which characters are displayed on the screen of your T.V. set. However, the combination of SAM and VDG potentially allow you to set the location of display memory to anywhere in memory aligned on a 512 byte boundary. For those of you who are interested in how a BASIC program or the interpreter itself works, this capacity provides a rather unique opportunity for a visual demonstration.

In the September '83 issue, the piece on conserving memory mentioned the frivolous and extravagant use of the CLEARed string space by the BASIC interpreter. The following program provides a graphic illustraiton of how the string space is managed by the BASIC interpreter.

The program, first of all, reserves some high memory for a machine language subroutine and POKEs it into memory. The subroutine modifies the display offset register in the SAM chip and allow you to display any portion of the 16K RAM. The routine is called in line 40 and sets the display memory to addresses $300 — $3FF (in fact, any parameter in this range would set the display to this page of memory). Lines 50 to 70 do some string manipulation which you can watch on your screen (the subroutine at line 90 is used to slow the process down to a pace with which the eye and brain can cope).

You should see that the interpreter uses up free string space at a rather rapid rate until it runs out of space. When this happens a garbage collection routine compacts all the currently active strings at the top of string space and then releases the remainder and returns to running the program. With a very large amount of string space, this garbage collection routine can sometimes take several minutes to executive and if the actual amount of free string space is small, then it will take place frequently, slowing down the speed at which the BASIC program is running.

The machine language subroutine is completely relocatable but does use one ROM call to retrieve the parameter passed by the USR function. This address ($B3ED) may need to be changed in future revisions of the Colour BASIC ROMs. You can use this technique to look at the operation of other BASIC statements by changing the program lines 40-80 and you will probably need to look at different areas of memory to see where the action is taking place. The only limitation so far seems to be that when the interpreter uses the normal text page, it sets the display offset register in the SAM to show the normal text page. However, with a little trial and error, you can use this method to explore the workings of your Colour Computer and its BASIC interpreter.

```
10 CLEAR 200,&H3F00
15 DIM B$(26)
20 A=&H3F00 : DEFUSR0 = A
30 FOR I=0 TO 26 : READ A : POKE A+I,D : NEXT I
40 A=USR0(&H3E00) : A$=""
50 FOR I=0 TO 26
60 A$=A$+CHR$(I+63) : B$(I)=CHR$(32) : GOSUB 90
70 NEXT I
80 A=USR0(&H400) : END
90 FOR J=0 TO 750 : NEXT J : RETURN
100 DATA 77,38,23,189,179,237,70,198
110 DATA 7,142,255,198,70,36,6,48
120 DATA 1,167,128,32,2,167,129,90
130 DATA 38,242,57
```

PEACH BOWL

If you own a Peach and are a new subscriber or have renewed your subscription with or subsequent to the first issue of Volume 4, then you are entitled to the new free software offer. However, the SOFTPAK program library is not suitable for the Hitachi Peach — instead, we offer our Peach readers the choice of one of three commercial games, viz. Peach Invaders, Ghost Gobbler or Scrambler. We are now at the stage where we wish to prepare and distribute this software gift but have encountered two difficulties:

1. Our mailing list does not identify all of our Peach subscribers.
2. We have no record of which particular game you wish to receive.

If you are a Peach owner already entitled to receive the new free software or who will become eligible by renewing your subscription at some stage during Volume 4, then please drop us a line as soon as possible with the following information:

(i) Your name and address
(ii) Your subscription expiry issue
(iii) Your selection of one of the following:
A—Peach InvadersB—Ghost Gobbler
C—Scrambler

Please direct this information to:
PEACH FREE SOFTWARE,
MICRO-80,
P.O. BOX 213,
GOODWOOD, S.A. 5034

GROUP ONE

Many of our readers with disk systems will appreciate the GRAFX utility in this month's issue. A number of people have recently pointed out that many Level 2 BASIC programs utilizing machine language subroutines more often than not do not work with Disk BASIC (see Input/Output and below). The reasons for this are fairly obvious. Most Z80 machine code contains local absolute address references and cannot be easily relocated. Secondly, on 16K Level 2 machines, these subroutines are usually placed at the top of memory (i.e. below address 8000 Hex) which usually conflicts with the program storage area in Disk BASIC in the case of all but the smallest of BASIC programs. The program RECALL on the SOFTPAK disk offers one type of solution to this problem. Another approach is the following from one of our readers, Mr. Wilson of Toronto:

MODIFICATION OF 'GOLF' FOR DISK USAGE

I recently added a disk drive to my System 80 and then, of course, set about transferring all my tape based programs to disk. With most BASIC programs this presents no problem at all. However, any such program which contains a machine language subroutine will require some modifications. One program of this type which I have converted is GOLF which was published in the July 1983 issue of MICRO-80. The changes I made may be of interest to some other readers. This is particularly true because, although articles are often published which point out that changes are needed and some describe the disk instruction DEFUSR, I have not seen any which explain in any detail all the changes needed to convert a given program.

The DEFUSR function was described in the August 1983 issue of MICRO-80. However, a brief recap of its use is given here again for completeness.

In tape-based Level 2 BASIC the entry address of a machine language subroutine is divided into its least and most significant bytes which are POKEd into locations 16426 and 16527 before the routine is called using the A = USR(O) call.

In disk BASIC the entry address is defined by DEFUSRn = address where address is decimal or hexadecimal. The number n in the DEFUSRn statement can be 0 to 9 thus allowing up to 10 machine language subroutines to be defined. The calls to the subroutines are made by A = USRn(x). More details on DEFUSR and USR will be found in your DOS manual.

In the GOLF program there is a short machine language subroutine defined in statements 10 to 60. This routine actually stores the screen image of the GOLF hole so that it can be restored to the screen later in the program. The machine language statements are stored in the dummy string LL$. The address of LL$ is then POKEd in line 60.

The machine language routine works by storing the 1024 screen data values from addresses 15360 to 16383 into memory locations 30720 onwards. In a 16K machine the locations are above the addresses needed for the BASIC program so they are in a safe location. However, when disk BASIC such as DOSPLUS 3.4 is used, space up to about 21K is used by disk BASIC and GOLF then stores up to about 35K. Thus the machine language routine uses locations in which BASIC program statements are stored. This will cause chaos to say the least! The solution is to change the routine so that it uses much higher locations in memory.

The address which must be changed in the machine language routine is given by the sequence 0.120 which appears in line 10 and line 20 DATA statements. In line 10 it is items 14 and 15 and in line 20 it is items 7 and 8. 0,120 defines a hex location 7800 (or decimal 30720). My machine has 48K RAM and thus addresses up to 65535. I therefore decided to place both the machine language routine itself and the storage locations used by the routine above 63000. I used location FAOO (or decimal 64000) in the routine as a storage location. The value FAOO translates into data values 0,250. Thus, to effect the change, alter the value 120 in item 15 of line 10 and item 8 of line 20 to 250.

The routine itself I decided to locate at 63500 (F80C in hex). This is achieved by replacing lines 30 to 60 of the original program by:

```
30 FOR I=63500 TO 63529
35 READ LO
40 POKE I-65536,LO
45 NEXT I
50 DEFUSR=63500
```

The final point to note is the POKE address in line 40. Because the System 80 can only handle integers up to 32767 it is necessary to use negative integers for the addresses above this value in POKE and PEEK statements.

With these two changes GOLF Now runs as it used to on tape.

WHAT YOU HAVE MISSED

Set out below is a list of some of the programs published in early issues of MICRO-80 magazine. Back issues are available for $2.50 each or at the annual subscription rate for 12 or more copies. Cassette editions are available for all issues for $4.00 each whilst DISKS are available for all issues FROM SEPTEMBER 1981 onwards. For 12 or more magazines with cassette/disks ordered at the same time, the relevant annual subscription rate applies. Programs for the Hitachi Peak/TRS-80 Colour Computer were first published in the April 1982 issue. Complete indices to the first three volumes of MICRO-80 magazine are included in the December 1980, December 1981 and the August 1983 edition.

ISSUE 10—SEPTEMBER 1980*	
ESCAPEE	(L1)
THE WORLD	(L1)
CUP '80	(L1)
CUP '80	(L2)
TRIANGLE	(L2)
THE WORLD	(L2)
SOLVER	(L2)
LOTTO PREDICTOR	(DB)
ISSUE 20—JULY 1982	
SHARE GRAPH	(L1)
CHEQUE BOOK DATA FILE	(L1)
BLOWFLY	(L2)
MILEAGE CALCULATOR	(L2)
CONVERSIONS	(L2)
STAR SHOOT	(L2)
BINGO	(L2)
GENIUS	(L2)
DISK INDEX	(DISK)
VOLUME 3 NO. 7—JUNE 1982	
UNIT CONVERSIONS	(CC/PEACH)
NORMAL DISTRIBUTION	(CC/PEACH)
MICRO GRAND PRIX	(L2)
PASSWORD	(L2)
PASSWORD CHANGE PROGRAM	(L2)
OTHELLO	(L2)
LOAN CALCULATION PACKAGE	(L2)

L1—Level 1
L2—Level 2
CC—Colour Computer
HP—Hitachi Peach

*Issue incorrectly labelled August.

The following back issues of MICRO-80 magazine are still available:

	'79	'80	'81	'82	'83
Jan	—	✓	✓	✓	—
Feb	—	✓	X	✓	—
Mar	—	✓	✓	✓	—
Apr	—	X	✓	✓	—
May	—	✓	✓	✓	—
Jun	—	X	✓	✓	—
Jul	—	✓	✓	✓	✓
Aug	—	X	✓	✓	✓
Sep	—	✓	✓	✓	✓
Oct	—	X	✓	X	✓
Nov	—	X	✓	—	
Dec	✓	✓	✓	—	

— means never published
✓ means issue available
X means issue out of print

FORM THREE

NEWDOS 80 provides a copy of the original Radio Shack Editor/Assembler modified so that source files can be saved to or loaded from disk. However, on the Model 3, Apparat chose to drop support for cassette tape so that you cannot load source files from cassette at all. This can be quite frustrating if you wish to modify a source file you may only have on tape. The Source utility in this month's issue will overcome this problem and save you having to tape the source code in a second time.

BMON ON THE MODEL 3

A number of readers have enquired about using BMON on the Model 3, without much success. Interestingly, the Adelaide Micro User Group published in their October newsletter some patches developed by one Tony Domigan to make BMON work on the Model 3. His item is reproduced here with permission for the benefit of our readers.

Eddy Paay's BMON will not work on the Model 3 because it uses the Model 1's keyboard caller address (03E3H), and jumps to BASIC via 06CCH. Rather than just patch the old caller with 3024H I have reworked some of Eddy's code to patch the current keyboard caller thus allowing BMON to work in Newdos, Ldos and TRSdos Disk BASICs as well as Model 3 BASIC. Furthermore, all cassette routines will prompt you for the baud rate to use and the ASCII character will now be displayed alongside the hex character in the edit mode.

Edit characters (below) enclosed in brackets, e.g. (FX) are for the 48K version only. If you are using a 32K BMON then substitute 'BX' and for the 16K version use '7X'.

1. (a) Reserve Memory
   (b) Load BMON thru SYSTEM . . . BMON
   (c) In place of answering '/ENTER' substitute . . . /64464 (48K), /48090 (32K), /31696 (16K)
2. Edit address FB99/BB99/7B99 and enter . . . CD, C9, 01, 21, 25, (FB), CD, 1B, 02, 2A, 16, 40, 22, C7, (FB), 21, C6, (FB), 22, 16, 40, 01, 18, 1A, C3, AE, 19, CD, C9, 01, CD, 42, 30, C9, CD, 33, 00, E5, 7E, 2A, 20, 40, C3, OC, FC, CD, 24, 30, B7, C8, FE, 02
3. Edit FB4E/BB4E/7B4E and enter 43, 54, 52, 4C, 3E, 20, 20, 42
4. Edit FB60/BB60/7B60 and enter 29, OD
5. Edit address FBFB/BBFB/7BFB and enter . . .
   21, E8, (FB), CD, 1B, 02, 21, 00, 50, CD, 60, 00, CD, 42, 30, 18, OC, 77, 23, 3E, 20, 77, 23, 22, 30, 40, E1, C9, 00
6. Edit address FD6E/BD6E/7D6E and enter CD, A8, (FB)
7. Edit address F9C1/B9C1/79C1 and enter CD, B4, (FB)
8. Select (B)asic and execute the BASIC line applicable to your BMON version.
   10 POKE − 2558, 187: POKE − 2557, 251' (48K)
   10 POKE − 18942, 187: POKE − 18941, 187' (32K)
   10 POKE 30209, 187: POKE 30210, 123' (16K)

9. *Cassette users enter CTRL-B (shift/down arrow/B) to enter BMON and create a system tape of the modified BMON.*

BMON	Start	End	Entry Addresses
16K	7210	7EFE	7B99
32K	B210	BEFE	BB99
48K	F210	FEFE	FB99

Disk users should re-boot DOS and transfer the program using the 'DUMP' command.

—Adelaide Micro User News, October, 1983.

DEFUSR PROBLEM

Some programs intended for Level 2 systems will cause problems when you try to run them on the Model 3. For example, Andre Marino reports the following difficulty:

"I am writing about a program you have already published two months ago (August, 1983). The program is DEFUSR. I am having problems in getting the program to load. The program loads for a brief second and then the screen scrolls up with a continuous flow of question marks. I have a TRS-80 Model 3 48K cassette based computer. My belief, through some experimentation, is that the program is in a bad area of memory, but have found no way to make the program work. I would appreciate it if you could help me out with this problem."

The memory from 4040H to 404FH is not a good place to put machine language programs on the Model 3. Although the Level 2 scratch pad areas used by the Model 1 and Model 3 are the same, most of the reserved RAM area used by the Disk Operating System is quite different. Parts of the Model 1 DOS reserved RAM is used to implement other features in the basic Level 2 mode of the Model 3 and more low memory is reserved for use by the DOS. This means that those machine language programs residing in Model 1 DOS reserved RAM locations will probably not work on a Level 2 Model 3. There are two solutions to this problem. The first involves protecting some high memory and moving the program to high memory (suggested in the Form Three column of the same issue). The second is to 'hide' the program between the reserved RAM and the start of the BASIC program storage area by moving the latter to a higher memory location.

If the particular machine language program is not relocatable and contains local absolute address references, then these must all be changed to reflect the program's new location in memory. If the source code is available then this is best done by reassembling the program at the new memory location by changing the ORG statement. If only the object machine code is available, then this can be a long and complex task which must be done by hand. Fortunately, the DEFUSR program does not require any such changes as it is relocatable. The first method has the additional disadvantage that you must protect high memory each time before using the program.

The second method is more elegant in the case of ***relocatable*** *machine language programs and can be achieved by the following code:*

```
                ; DEFUSR for the Model 3
4F00                    ORG     4F00H           ; Entry /20224
4F00 2AA440     START   LD      HL,(40A4H)      ; Start of BASIC pointer
4F03 225C41             LD      (415CH),HL      ; Disk BASIC exit for DEFUSR
4F06 11194F             LD      DE,DEFPRC       ; The DEFUSR code address
4F09 1A         LOOP    LD      A,(DE)          ; Move the code to where
4F0A 77                 LD      (HL),A          ;  BASIC programs normally
4F0B 13                 INC     DE              ;    start
4F0C 23                 INC     HL
4F0D B7                 OR      A
4F0E 20F9               JR      NZ,LOOP         ; Loop until finished
4F10 22A440             LD      (40A4H),HL      ; Set new Start of BASIC
4F13 CD4D1B             CALL    1B4DH           ; Do a 'NEW' to setup the
                                                ;  remaining BASIC pointers
4F16 C3191A             JP      1A19H           ; Return to BASIC
4F19 CF         DEFPRC  RST     8               ; DEFUSR code
4F1A C1                 DEFB    0C1H
4F1B CF                 RST     8
4F1C D5                 DEFB    0D5H
4F1D CD3723             CALL    2337H
4F20 E5                 PUSH    HL
4F21 CD7F0A             CALL    0A7FH
4F24 228E40             LD      (408EH),HL
4F27 E1                 POP     HL
4F28 C9                 RET
4F29 00                 NOP                     ; Mandatory terminator
4F00                    END     START
```

This program will tuck DEFUSR between reserved RAM and the BASIC program storage area. This technique could also be used to place other programs here with some precautions. The program should be relocatable and must not contain a zero within its code (since the particular loop that moves the program code terminates when a zero is encountered — a different loop structure could be used). If you don't have an assembler then the following BASIC program will load the program into memory and run it:

Be warned, this will destroy any resident BASIC Program so CSAVE the program ***before*** *you RUN it.*

```
10 'DEFUSR for the Model 3
20 POKE 16526,0 : POKE 16527,79 ' Set USR entry point
30 A=20224 'Start Address
40 FOR I= 0 TO 41 : READ D :POKE A+I,D : NEXT I
50 X=USR(0)
60 DATA 42,164,64,34,92,65,17,25,79,26,119,19,35,183,32,249
70 DATA 34,164,64,205,77,27,195,25,26,207,193,207,213,205,55,35
80 DATA 229,205,127,10,34,142,64,225,201,0
```

PROGRAMMING

AN EXPLANATION OF HOW TO MAKE FULL USE OF THE PEEK, POKE AND USR STATEMENTS

by Gordon S. Thomas

The object of this article is to explain the use of the PEEK, POKE and USR statements and functions in Level 2/Model 3 BASIC following a request in the "Readers' Requests" section in Micro-80 Vol. 3 No. 10 (September 1982). The article assumes no previous knowledge of the uses of these statements.

Unless otherwise stated, all information contained herewith is equally applicable to TRS-80 Models 1 and 3 cassette and disk systems (and all other software compatible computers) with any memory size. It is not applicable to Level 1 BASIC computers since they do not have these statements.

The computer's memory is made up of two main types of memory, which are Read Only Memory (ROM) and Random Access Memory (RAM). ROM is where the Level 2/Model 3 BASIC interpreter is stored. ROM cannot be changed by any software (i.e. written to).

RAM, on the other hand, can be changed and it is here that all user programs and data are stored (until the power is disconnected). Therefore, to modify the computer's operation in any manner by software requires that the contents of RAM be changed.

The Z80 microprocessor contained in the computer is capable of interacting with 65536 memory locations. Depending on the computer, anywhere between 12K and 14K of these memory locations are used by the ROM with the rest being used by the RAM. Each one of these memory locations is assigned a number, called an "address". It is these addresses which the PEEK function and the POKE statement require in their respective syntax.

There are various, different ways of referring to these addresses. They can be numbered using the decimal system (which is just our normal everyday counting system) or they can be numbered using the hexadecimal system, which is what the computer uses. (This is not strictly correct but is adequate for the purposes of this article).

The hexadecimal system uses the digits 0-9 and the letters A-F to designate the decimal numbers 0-15 respectively. Instead of each place in a number being a power of 10 (as it is in the decimal system) the hexadecimal system has every place representing a quantity of a power of 16.
e.g. 38 (decimal) = $(3 \times 10^1) + (8 \times 10^0)$
30 (hex) = $(3 \times 16^1) + (8 \times 16^0)$
= 56 (dec)
38 (dec) = $(2 \times 16^1) + (6 \times 16^0)$
= 26 (hex)

PEEK: If we want to know what value is stored in a particular address all we have to do is type: PRINT PEEK (address)
e.g. to find out what is stored in the top left hand corner of the screen (address 15360) we would type
PRINT PEEK (15360)

This will return a decimal number which represents what is contained in address 15360. Therefore if the top left hand corner of the screen contains the letter "B" then the decimal value 66, which is the ASCII code for the letter "B", will be returned.

Any address in the computer's memory can be PEEKed (i.e. from 0 to top of RAM). The top of RAM addresses for the various memory sizes are as follows:

Mem Size	Hex	Dec
16K	7FFF	32767
32K	BFFF	49151
48K	FFFF	65535

In order to PEEK any address above 32767 it is necessary to subtract 65536 from the address in question.
e.g. to display the contents of 40000, type
PRINT PEEK (−25536)
since 40000 − 65536 = −25536. The hexadecimal equivalent of 40000 is 9C40H since 9C40H = $(9 \times 16^3) + (12 \times 16^2) + (4 \times 16^1) + (0 \times 16^0)$ = 40C00 where H indicates that it is hexadecimal quantity.

However, if you type (for Disk BASIC only)
PRINT &H9C40 (syntax for 9C40 hex) the computer will respond with −25536, i.e. the computer takes care of the conversion process. This is why many programmers prefer to use hexadecimal when referring to memory addresses — it requires no additional calculations to determine what number to use to designate a particular address. In general, to PEEK any address in the computer's memory, type
PRINT PEEK (X + 65536 * (X > 32767)

For X > 32767 the expression (X > 32767) will be TRUE, resulting in −1.

This effectively subtracts 65536 from the address.

For X < = 32767 the expression (X > 32767) will be FALSE, resulting in 0.

This will not affect the address in any way.

The same rules apply for the addresses in the POKE statement.

POKE: If we want to change the contents of a particular memory location we use the POKE statement. Its syntax is
POKE address, value
e.g. to store a "1" in the top left hand corner of the screen we would type
POKE 15360, 49
(49 is the ASCII code for the number "1")

The POKE statement is useful for loading small machine language routines into memory to be accessed from BASIC. It also has many other uses. Some of the most common are:

1. setting memory size from BASIC
(addresses 16561 − 16562)
2. loading graphics character onto the screen
(addresses 15360 − 16383)
3. disabling the (BREAK) key in Cassette BASIC
(addresses 16396 − 16397)
4. pointing to a USR routine in Cassette BASIC
(addresses 16526 − 16527)

In order to be able to fully utilize the capabilities of the POKE statement it is necessary to have a basic understanding of the terms "least significant byte" and "most significant byte". When we see the number 327 in everyday life we all know what it represents, since we are used to dealing with decimal quantities. The 3 can be thought of as the most significant digit and the 7 can be thought of as the least significant digit. In hexadecimal we group two digits together and call it a byte.
e.g. for 9C40H (40000 decimal)
the most significant byte is 9CH with the least significant byte being 40H. The decimal equivalents of 9CH and 40H are 156 and 64 respectively. There is an alternative way of determining these numbers. Note that 156 is actually stating how many whole lots of 256 (decimal) that there are in 40000, and that 64 is stating how many lots of 1 there are left over.
i.e. 40000 = (156 × 256) + (64 × 1)

Therefore we can arrive at the same numbers using the following procedure:
MSB = INT (40000/256) = 156
LSB = 40000 − (256 × MSB) = 64

Either of these methods may be used to determine the LSB and MSB of any address for which they are required.

Many settings require this exact format to be used in order to change them. For example, the memory size is stored in addresses 16561 − 16562 in the format LSB,MSB.
i.e. 16561 contains the LSB, and
16562 contains the MSB.

This is true in general for all two byte quantity storers. The first address contains the LSB and the second address contains the MSB. Therefore to set a memory size of 40000 we would have to type
POKE 16561,64
POKE 16562,156
CLEAR xxxx
where xxxx is the string space required.

The CLEAR forces BASIC to recognize the new top of memory. This technique for setting the memory size can be used on both cassette and disk systems and saves the operator from having to enter the memory size at power-up in response to the "Memory Size?" question. The program included with this article provides an example of the use of this facility.

POKE is also used on the model 3 to set values for a whole range of different features, e.g. to prevent the top two lines of the screen from scrolling, type
POKE 16916,2
or, to set the special characters mode, type
POKE 16420,1
(This saves using PRINT CHR$(22) which can be a nuisance since it is effectively only a toggle switch and the programmer can never be certain which mode is set).

For other useful addresses on the Model 3, refer to the Model 3 BASIC Reference Manual, pp. 83-84.

USR: The USR function is used to provide an interface between a BASIC program and a machine language subroutine to be called from the BASIC program. Once a machine language subroutine has been poked into memory (see later) BASIC needs a way to call it. The USR function caters for this requirement.

Before BASIC can call a machine language subroutine, it needs to know where the entry point is located in memory, i.e. where to start executing from. In Cassette BASIC this is achieved by POKEing the address in LSB, MSB format into memory locations 16526-16527. For Disk BASIC it is achieved by typing
DEFUSRx = address
where x is a number from 0 to 9 indicating which USR routine is being used (since Disk BASIC provides the choice of 10 possible USR routines).
e.g. If the entry point is 40000,
For Cassette BASIC, type
POKE 16526,64 (LSB)
POKE 16527,156 (MSB)
For Disk BASIC, type
DEFUSR0 = 40000
or DEFUSR0 = &H9C40 to use USR routine 0

The machine language subroutine can then be accessed by typing
X = USR (arg) for Cassette BASIC
and X = USR0 (arg) for Disk BASIC
(Note: The Disk BASIC call will function correctly without the 0 but it is always safest to include it so you don't forget which routine you're accessing).

The number enclosed by the parentheses, (arg), is an integer argument which can be sent to the machine language routine. For example, if we had a routine to scroll a certain number of lines up the screen, the argument would be the number of lines that we wanted to scroll. The argument sent to the routine may be any integer in the range −32768 to +32767 inclusive. If the programmer does not wish to send an argument then the number enclosed by the parentheses is considered to be a dummy argument and is only there to satisfy the syntax requirements of the USR function.

The variable assigned to the USR routine (in this case X) will contain the argument sent from the machine language routine, if any.

LOADING MACHINE LANGUAGE SUBROUTINES INTO MEMORY: There are several ways of loading machine language subroutines into memory. The easiest and the most obvious way is to load it via the SYSTEM mode in a cassette system or via the DOS command LOAD in a disk system. However, these two methods are only any good if you have an assembled version of the subroutine stored on disk or tape, whatever the case may be.

For other methods of loacing machine language subroutines into memory, I thoroughly recommend a copy of Lewis Rosenfelder's book "BASIC

Faster and Better & Other Mysteries", which is available from MICRO-80 for $39.95 and is also listed in Tandy's RSC-9 Catalogue for $39.95.

The method that I will use is the one which I consider to be the easiest to understand and modify for the various memory sizes. This method involves POKEing the values into memory byte by byte from DATA statements.

I have included two sample programs with this article. The first of these programs provides a substitute for the BASIC INPUT statement. It is superior to the statement it replaces in the following respects:

1. The BREAK, CLEAR and all arrow keys except the back arrow are all locked out.
2. The ENTER key will be ignored if the current length of the input is zero.
3. It provides a flashing cursor (for both Models 1 and 3).
4. The cursor may be changed to any character available in the computer's character set with a simple POKE statement.
5. It will only accept a predetermined length of input (specified by the programmer in the USR call) and then the cursor is changed to a non-flashing program-definable character indicating that no more input will be accepted.
6. Because it is written in machine language, it cannot be out-typed as can so many of the equivalent BASIC routines.
7. It shows the operator how many characters may be entered by displaying a number of characters on the screen corresponding to the maximum length of the input.
8. It will accept all delimiters (e.g. commas) without ignoring the characters which are entered after them.

In summary this routine effectively gives BASIC a super-powered LINE-INPUT function. It can be used on both cassette and disk systems, as can the BASIC program which enters the routine and demonstrates how to use it in your program.

Program Listing 1 is the documented source code for the USR routine to replace the INPUT statement. This routine only makes use of four ROM routines all of which are located in the same place on Models 1 and 3. These are the 49H ROM routine which waits for a character to be entered from the keyboard, and the 2BH ROM routine which accepts a character from the keyboard if a key has been pressed. Both of these ROM routines are documented in the technical information section of the Model III Reference Manual. I checked with the Memory Map for Level II in '80 Micro — a Wayne Green Publication (Dec. 82 pp. 298-311) and found these same ROM routines for the Model I. The other ROM routines referred to are the ones for accepting and sending arguments from and to BASIC. These routines (0A7FH and 0A9AH) are documented under the USR function in both the Level II and Model 3 BASIC Reference Manuals. They are the same for both computers. Therefore I foresee no problems with getting this routine to work on either computer.

The source listing as shown has been assembled for a 48K computer with an origin of FFOOH. However, this should be changed to BFOOH for a 32K computer and 7FOOH for a 16K computer. The source code may then be entered into a computer via an editor/assembler such as EDTASM.

```
              ;**************************************************
              ;*                                                *
              ;*              PROGRAM LISTING 1                 *
              ;*                                                *
              ;*  USR ROUTINE TO REPLACE THE 'INPUT' STATEMENT  *
              ;*                                                *
              ;*         COPYRIGHT (C) 1983 BY G.S.THOMAS       *
              ;*                                                *
              ;**************************************************
              ;
FFØØ                    ORG     ØFFØØH
4Ø2Ø          CURPOS    EQU     16416           ;CURSOR POSITION ADDRESS
ØA7F          BASARG    EQU     ØA7FH           ;ARGUMENT FROM BASIC
ØA9A          ALARG     EQU     ØA9AH           ;ASSEMBLY LANGUAGE ARG
ØØ49          KBWAIT    EQU     49H             ;WAIT FOR CHAR FROM KB
ØØ2B          KBCHAR    EQU     2BH             ;GET CHARACTER FROM KB
FFØØ 1841               JR      START           ;SKIP STORAGE AREA
ØØ4Ø          INPUT     DEFS    64              ;ROOM TO SAVE TEXT
ØØØ1          CHAREN    DEFS    1               ;CONTAINS CHAR ENTERED
FF43 CD7FØA   START     CALL    BASARG          ;GET ARG FROM BASIC
FF46 45       BEGIN     LD      B,L             ;B CONTAINS MAX LENGTH
FF47 ØEØØ               LD      C,Ø             ;C CONTAINS CURRENT LENGTH
FF49 C5                 PUSH    BC              ;SAVE LENGTH INFORMATION
FF4A 2A2Ø4Ø             LD      HL,(CURPOS)     ;GET CURSOR POSITION
FF4D E5                 PUSH    HL              ;SAVE IT
FF4E 3688     PROMPT    LD      (HL),136        ;PRINT CHR$(136) AT CURPOS
FF5Ø 23                 INC     HL              ;NEXT SCREEN POSITION
FF51 1ØFB               DJNZ    PROMPT          ;UNTIL MAX LENGTH
FF53 362Ø               LD      (HL),32         ;BLANK ONE CHAR AFTER
FF55 E1                 POP     HL              ;RETRIEVE OLD CURPOS
FF56 D1                 POP     DE              ;LENGTH INFO INTO DE
              ;
FF57 7A       READKB    LD      A,D             ;GET MAXIMUM LENGTH
FF58 BB                 CP      E               ;COMPARE CURRENT LENGTH
FF59 282C               JR      Z,MAXLEN        ;GO IF MAX = CURRENT
FF5B ØEØ2     FLASH     LD      C,2             ;NO. OF TIMES THROUGH LOOP
FF5D Ø65A               LD      B,9Ø            ;DELAY TIME
FF5F 368F     CURON     LD      (HL),143        ;GRAPHICS BLOCK
FF61 D5                 PUSH    DE              ;SAVE LENGTH INFORMATION
FF62 CD2BØØ             CALL    KBCHAR          ;GET CHAR IF AVAILABLE
FF65 D1                 POP     DE              ;RETRIEVE LENGTH INFO
FF66 FEØØ               CP      Ø               ;KEY PRESSED ?
FF68 2Ø24               JR      NZ,KEY          ;IF YES THEN GO
FF6A 1ØF3               DJNZ    CURON           ;ELSE TRY AGAIN
FF6C ØD                 DEC     C               ;ONE LESS LOOP
FF6D B9                 CP      C               ;ANY LOOPS LEFT?
FF6E 2ØEF               JR      NZ,CURON        ;IF YES THE GO
FF7Ø ØEØ2               LD      C,2
FF72 Ø65A               LD      B,9Ø
FF74 3688     CUROFF    LD      (HL),136        ;DOT PROMPT
FF76 D5                 PUSH    DE
FF77 CD2BØØ             CALL    KBCHAR
FF7A D1                 POP     DE
```

```
FF7B FEØØ      ØØ54Ø          CP      Ø
FF7D 2ØØF      ØØ55Ø          JR      NZ,KEY          ;ETC
FF7F 1ØF3      ØØ56Ø          DJNZ    CUROFF
FF81 ØD        ØØ57Ø          DEC     C
FF82 B9        ØØ58Ø          CP      C
FF83 2ØEF      ØØ59Ø          JR      NZ,CUROFF
FF85 18D4      ØØ6ØØ          JR      FLASH           ;KEEP FLASHING
FF87 363C      ØØ61Ø MAXLEN   LD      (HL),6Ø         ;PRINT "<"
FF89 D5        ØØ62Ø          PUSH    DE              ;SAVE LENGTH INFORMATION
FF8A CD49ØØ    ØØ63Ø          CALL    KBWAIT          ;WAIT FOR CHAR FROM KB
FF8D D1        ØØ64Ø          POP     DE              ;RETRIEVE LENGTH INFO
               ØØ65Ø ;
FF8E 3242FF    ØØ66Ø KEY      LD      (CHAREN),A      ;SAVE THE CHAR ENTERED
FF91 3EØØ      ØØ67Ø          LD      A,Ø
FF93 BB        ØØ68Ø          CP      E               ;CURRENT LENGTH ZERO?
FF94 3A42FF    ØØ69Ø          LD      A,(CHAREN)      ;RESTORE THE CHARACTER
FF97 2811      ØØ7ØØ          JR      Z,LETTER        ;IF E=Ø THEN GO
FF99 FEØD      ØØ71Ø          CP      13              ;<ENTER> ?
FF9B 2831      ØØ72Ø          JR      Z,ENTER         ;IF YES THEN GO
FF9D FEØ8      ØØ73Ø          CP      8               ;<ERASE> ?
FF9F 281F      ØØ74Ø          JR      Z,ERASE         ;IF YES THEN GO
FFA1 FE18      ØØ75Ø          CP      24              ;<SHIFT-ERASE> ?
FFA3 2ØØ5      ØØ76Ø          JR      NZ,LETTER       ;IF NOT THEN GO
FFA5 6A        ØØ77Ø          LD      L,D             ;MAX LENGTH BACK INTO L
FFA6 26ØØ      ØØ78Ø          LD      H,Ø             ;RESET H
FFA8 189C      ØØ79Ø          JR      BEGIN           ;START INPUT AGAIN
FFAA 7A        ØØ8ØØ LETTER   LD      A,D             ;GET MAXIMUM LENGTH
FFAB BB        ØØ81Ø          CP      E               ;COMPARE CURRENT LENGTH
FFAC 28A9      ØØ82Ø          JR      Z,READKB        ;IF MAX=CURRENT THEN GO
FFAE 3A42FF    ØØ83Ø          LD      A,(CHAREN)      ;RESTORE THE CHARACTER
FFB1 FE2Ø      ØØ84Ø          CP      32              ;LOWER ASCII LIMIT
FFB3 FA57FF    ØØ85Ø          JP      M,READKB        ;IGNORE CHAR IF LOWER
FFB6 FE7B      ØØ86Ø          CP      123             ;UPPER ASCII LIMIT
FFB8 F257FF    ØØ87Ø          JP      P,READKB        ;IGNORE CHAR IF GREATER
FFBB 77        ØØ88Ø          LD      (HL),A          ;PRINT THE CHARACTER
FFBC 1C        ØØ89Ø          INC     E               ;INCREMENT THE LENGTH
FFBD 23        ØØ9ØØ          INC     HL              ;NEXT SCREEN POSITION
FFBE 1897      ØØ91Ø          JR      READKB          ;GO BACK
               ØØ92Ø ;
FFCØ 7A        ØØ93Ø ERASE    LD      A,D             ;GET MAXIMUM LENGTH
FFC1 BB        ØØ94Ø          CP      E               ;COMPARE CURRENT LENGTH
FFC2 2ØØ6      ØØ95Ø          JR      NZ,NOTMAX       ;GO IF MAX <> CURRENT
FFC4 362Ø      ØØ96Ø          LD      (HL),32         ;PRINT A SPACE
FFC6 1D        ØØ97Ø PROCES   DEC     E               ;DECREMENT LENGTH
FFC7 2B        ØØ98Ø          DEC     HL              ;PREVIOUS SCREEN POSITION
FFC8 188D      ØØ99Ø          JR      READKB          ;GO BACK
FFCA 3688      Ø1ØØØ NOTMAX   LD      (HL),136        ;PRINT DOT PROMPT
FFCC 18F8      Ø1Ø1Ø          JR      PROCES          ;PROCESS THE SPECS
               Ø1Ø2Ø ;
FFCE 7A        Ø1Ø3Ø ENTER    LD      A,D             ;GET MAXIMUM LENGTH
FFCF 93        Ø1Ø4Ø          SUB     E               ;SUBTRACT CURRENT LENGTH
FFDØ 2ØØ4      Ø1Ø5Ø          JR      NZ,CLINE        ;IF DIFFERENCE<>Ø THEN GO
FFD2 362Ø      Ø1Ø6Ø          LD      (HL),32         ;PRINT A SPACE
FFD4 18Ø6      Ø1Ø7Ø          JR      BASIC           ;BACK TO BASIC
FFD6 47        Ø1Ø8Ø CLINE    LD      B,A             ;DIFFERENCE INTO B
FFD7 362Ø      Ø1Ø9Ø BLANK    LD      (HL),32         ;BLANK OUT SCREEN POSITION
FFD9 23        Ø11ØØ          INC     HL              ;NEXT SCREEN POSITION
FFDA 1ØFB      Ø111Ø          DJNZ    BLANK           ;UNTIL ALL DONE
FFDC 4B        Ø112Ø BASIC    LD      C,E             ;CURRENT LENGTH INTO C
FFDD D5        Ø113Ø          PUSH    DE              ;SAVE LENGTH INFORMATION
FFDE 2A2Ø4Ø    Ø114Ø          LD      HL,(CURPOS)     ;GET ORIGINAL CURPOS
FFE1 11Ø2FF    Ø115Ø          LD      DE,INPUT        ;DESTINATION
FFE4 Ø6ØØ      Ø116Ø          LD      B,Ø             ;RESET B
FFE6 EDBØ      Ø117Ø          LDIR                    ;SAVE THE TEXT
FFE8 D1        Ø118Ø          POP     DE              ;RETRIEVE LENGTH INFO
FFE9 26ØØ      Ø119Ø          LD      H,Ø             ;RESET H
FFEB 6B        Ø12ØØ          LD      L,E             ;FINAL LENGTH INTO L
FFEC C39AØA    Ø121Ø          JP      ALARG           ;PASS IT TO BASIC
ØØØØ           Ø122Ø          END
```

For those who do not have an editor/assembler, Program Listing 2 is the BASIC program which will enter the routine into memory. This program will work on either a disk system or a cassette system with any memory size. The numbers contained in the DATA statements are the decimal equivalents of the hexadecimal numbers in the second column on the left of the source listing.

```
1Ø  '*********************************************
2Ø  '*                                           *
3Ø  '*             PROGRAM LISTING 2             *
4Ø  '*                                           *
5Ø  '*  BASIC PROGRAM TO POKE USR ROUTINE INTO   *
6Ø  '*  MEMORY TO REPLACE THE INPUT STATEMENT    *
7Ø  '*                                           *
8Ø  '*    COPYRIGHT (C) 1983 BY G.S.THOMAS       *
9Ø  '*                                           *
1ØØ '*********************************************
```

```
110 '
120 'NOTE:   The routine will work as is without changing any
130 '        of the settings. The settings are there purely and
140 '        simply for the programmer's convenience.
150 '
160 ' To save memory, all the REM statements can be removed
170 ' and the smaller lines can be compounded together using
180 ' the colon (":").
190 '   For example, see line 360
200 '
210 DATA24,65,205
220 DATA127,10,69,14,0,197,42,32,64,229,54,136,35,16,251,54,32
230 DATA225,209,122,187,40,44,14,2,6,90,54,143,213,205,43,0,209
240 DATA254,0,32,36,16,243,13,185,32,239,14,2,6,90,54,136,213
250 DATA205,43,0,209,254,0,32,15,16,243,13,185,32,239,24,212,54
260 DATA60,213,205,73,0,209,50,66,255,62,0,187,58,66,255,40
270 DATA17,254,13,40,49,254,8,40,31,254,24,32,5,106,38,0,24,156
280 DATA122,187,40,169,58,66,255,254,32,250,87,255,254,123,242
290 DATA87,255,119,28,35,24,151,122,187,32,6,54,32,29,43,24
300 DATA141,54,136,24,248,122,147,32,4,54,32,24,6,71,54,32,35
310 DATA16,251,75,213,42,32,64,17,2,255,6,0,237,176,209,38
320 DATA0,107,195,154,10
330 TM=PEEK(16561)+PEEK(16562)*256    'Get Top of Memory
340 N2=INT(TM/256)    'Calculate Most Significant Byte
350 IFTM-256*N2<172THENN2=N2-1    'Make room for routine
360 POKE16561,255:POKE16562,N2-1    'Set NEW Top of Memory
370 CLEAR50    'Make BASIC recognize new Top of Memory
380 NT=PEEK(16562)+1    'MSB of Start of Routine
390 SA=NT*256    'Starting Address for Routine
400 IFSA>32767THENSA=SA-65536    'Prevent OVERFLOW Error
410 READA:POKESA,A:READA:POKESA+1,A    'POKE first two bytes
420 FORI=0TO171    '174 bytes in the DATA statements
430 READA    'Read them
440 IFA=255THENA=NT    'Change the NON-RELOCATABLE instructions
450 POKESA+I+67,A    'Put the byte into memory
460 NEXTI    'Do the next one
470 'Point to the USR routine:
480 ONERRORGOTO3020:DEFUSR=SA:GOTO500    'DISK Systems
490 POKE16526,0:POKE16527,NT    'CASSETTE Systems
500 MS=NT*256    'Reference address as stated in article
510 IFMS>32767THENMS=MS-65536    'Adjust if necessary
1000 '
 Your program starts here
1010 'This is a demonstration program
1020 CLS:PRINT"What is your name? ";    'Question
1030 L=20    'Maximum permitted length
1040 POKEMS+115,45    'Halve period for which cursor is "off"
1050 POKEMS+136,191    'CHR$(191) at end of input
1060 POKEMS+117,42    'Set cursor "off" character to "*"
1070 GOSUB2000    'Call subroutine to accept input
1080 N$=I$ 'Save contents of input - I$ will be wiped next time
1090 PRINT:PRINT"Your name is "N$"."
1100 PRINT"How old are you, "N$"? ";    'New question
1110 L=2    'Maximum length
1120 POKEMS+96,35    'Set cursor "on" character to "#"
1130 POKEMS+136,60    'End of input char to "<"
1140 POKEMS+94,180    'Double the original "off" delay
1150 POKEMS+117,32    'Set cursor "off" character to " "
1160 POKEMS+79,46:POKEMS+203,46    'Length of input char to "."
1170 GOSUB2000    'Call subroutine to accept input
1180 AGE=VAL(I$)    'Save numeric value of I$
1190 PRINT:PRINTN$" is"AGE"years old."
1200 END    'End of Program
1999 '
 Subroutine to accept input from the keyboard and set up
  I$ to point to this input.
2000 I$=""    'Clear the variable to contain the input
2010 X=USR(L)    'Call routine - set max length of L
2020 POKEVARPTR(I$),X    'Set length of I$
2030 POKEVARPTR(I$)+1,2    'LSB of address to I$
2040 POKEVARPTR(I$)+2,NT    'MSB of address to I$
2050 RETURN    'Return from the subroutine
3000 '
 Error trap to catch BASICs which have no DEFUSR statement
3010 'Resume execution only if error is in line 430
3020 IFERL=480THENRESUME490ELSEONERRORGOTO0:END
```

The program operates in the following manner:

It obtains the current tup of memory from the addresses 16561-16562 and allocates room for itself just below the top of memory. This is done in 256 byte increments so as to make relocating the routine easy. Unfortunately, I could not make the routine truly relocatable (I had to include two JP instructions which are not relocatable) and therefore I had to have the BASIC program which POKEd the routine into memory do the relocating for me. It then resets the top of memory to protect itself and prevent BASIC from storing data up there and writing over the routine. It then proceeds to POKE the data into memory and once this has been completed, the routine is ready for use. The program then sets up the USR routine pointers using the addresses 16526-16527 or the DEFUSR statement, whichever is applicable.

To access the routine from BASIC, insert a line of the following form in your program:

```
1000 I$ = " "           'Clear the variable to
                          contain the input
:X = USR(L)             'Make the call
:POKE VARPTR(I$),X      'Set the length
                          of I$
:POKE VARPTR(I$) + 1,2  'LSB of address
                          to I$
:POKE VARPTR(I$) + 2,NT 'MSB of
                          address to I$
```

The argument L is the maximum length of input to be enforced by the routine. It may be a variable, a constant or an expression. Therefore if L = 15 then the routine will only accept 15 legal characters of input from the keyboard. On return from the routine the actual number of characters entered by the operator is stored in the variable X.

This demonstrates a very powerful use of the POKE statement in conjunction with the VARPTR (or variable pointer) function. If you have a string variable, for example A$, and you type

PRINT VARPTR(A$)

the address where the length of the string contained in A$ is stored in memory will be returned. Therefore it follows that if you type

PRINT PEEK(VARPTR(A$))

then the length of the string contained in A$ will be returned. Similarly,

PRINT PEEK(VARPTR(A$) + 1)

will return the LSB of the starting address of the contents of A$ in memory and

PRINT PEEK(VARPTR(A$) + 2)

will return the MSB of the same address. Proceeding further on this idea, if you let

*F = PEEK(VARPTR(A$) + 1 + PEEK(VARPTR(A$) + 2) * 256*

and then type

PRINT PEEK(F)

then the ASCII value of the first character in A$ will be displayed.

The program uses this idea in the last three POKE statements. Since I$ is the variable set up to contain the input and X is the actual number of characters entered by the operator, it seems reasonable that the length of I$ should be X. This is the purpose of the first POKE statement. It merely POKEs X in the memory location where the length of I$ is stored. The purpose of the next two POKEs is to point I$ to the input entered by the operator which is located in a known buffer set up in the machine language routine. The BASIC program to enter the routine is set up in such a way as to always have the LSB of the address containing the input as 2. The MSB of the address is the MSB of the memory size + 1 (since the input is stored in the address which is 2 bytes above the max-

imum memory address accessible by BASIC i.e. the memory size). The variable NT contains the MSB of the memory size and it is this value which is POKEd into the MSB location. On completion of these three POKEs, the variable I$ will contain the input entered by the operator and may be processed in the same manner as any standard string variable (because that's all it is). To process numeric data, the VAL function of BASIC can be used.
e.g. if $1 = "23" then PRINT VAL(I$) will return the number 23 as distinct from the string "23".

The routine should be POKEd into memory very early on in your program since it adjusts the memory size and clears all variables on initialization. It only uses about 250 bytes of top memory and once it has been entered into memory the data lines can be deleted if memory is precious.

In order to be able to make use of the many features of the routine, it is advantageous to set up a variable just after the initialization sequence as follows:
*MS = NT * 256*

Once this has been done POKEing different numbers into the following addresses allows you to change the settings of the routine:

SETTING	ADDRESS	DEFAULT
Character to be displayed indicating length of input	MS+79, MS+203	136
Cursor character (when "on")	MS+96	143
Cursor character (when "off")	MS+117	32
Character to be displayed indicating end of input	MS+136	60
Cursor flashing speed—"on" delay	MS+94	90
—"off" delay	MS+115	90

All settings listed here require integer values in the range 0-255. In the case of characters to be displayed, ensure that the number you choose has a character corresponding to it which is displayable by your computer. Where two addresses are listed, this means that both addresses must be changed for the feature to function properly.

There are two states in which the cursor can be. It can either be "on" (like it is for the length of time that you can see it while it is flashing) or it can be "off". If these states change at regular time intervals (e.g. every half a second) the effect of a flashing cursor is created. This is what is meant by the cursor being "on" and "off". We usually associate a flashing cursor with a CHR$(143) graphics block blinking on and off. In this case, the "on" character is CHR$(143), the graphics block, and the "off" character is a CHR$(32), a blank. This routine allows you to define what the cursor's "on" and "off" characters are and by POKEing values into the specified addresses you can change these characters to what every you like.

By POKEing different values into the addresses specified above for the "on" and "off" delay, you can increase or decrease the flashing speed of the cursor according to your requirements. To see which values are currently set, all you have to do is PEEK the addresses corresponding to the feature about which your require information and this will tell you the value of the setting. Always remember that just because you have a machine language routine stored up there in protected memory, that doesn't mean that you cannot modify its operation to suit your own ends by using the POKE statement.

In conclusion, I hope that this article has fulfilled the needs of those people who requested it, and since this is my first article, I would appreciate any feedback on it (whether positive or negative) so that I will know whether I have covered the requested material adequately.
58 Warnbro Beach Road,
SAFETY BAY, W.A. 6169

I will be happy to try and answer any queries that readers may have. Please include a self-addressed stamped envelope.

THE ADVENTURE SYSTEM

A SOFTWARE REVIEW

by Ed Grigonis

Those of you who have ever considered writing an Adventure would know that there are a number of ways of achieving this objective. These various methods may be summarised as follows:—

(a) Dig into an existing Adventure and change the existing data. The major flaw with this method is that you are restricted to the original Adventure format.

(b) Write a BASIC Adventure. This is OK but you will find that memory limitations (particularly in a 16K computer) will prove frustratingly restrictive. The process of actually coding the Adventure will also detract from the task in hand.

(c) Use the Adventure Generator included in "The Captain 80 Book of Basic Adventures" to get rid of the drudgery. This is OK as well, but you may still be hampered by memory limitations.

(d) Learn machine language. If you want the latest fantastic graphics Adventure then this is the way to go. Be prepared to devote a lot of time to the task!

If, on the other hand, your only objective is to write a great Adventure and you aren't particularly interested in graphics then you can always take the easy way out. This will still involve learning a new computer language but the effort required is minimal when stacked up against the alternatives.

What I am talking about is the Adventure Language as contained in "The Adventure System" from the Alternative Source.

First, a bit of history. Hands up all those who think Scott Adams actually sat down and wrote a completely new machine language program for each of his Adventures? Sorry, folks! 'Taint so!!! What he actually did do, very early on, was to sit down and write himself an Adventure Editor in machine language. Most of his Adventures were actually written by feeding data into this program and letting it do all the hack work. I suspect that similar methods were used to get his Adventures onto other computers.

Unfortunately, the Adventure Editor used by Scott Adams has never been available via the commercial market. Into the picture stepped Allan Moluf, well known author of programs for the TRS-80, and Bruce Hansen, author of "Tasmon". Allan Moluf produced a BASIC Adventure Editor as well as a companion BASIC Driver program to use the generated data base. Subsequent machine language enhancements were added by Bruce Hansen. This first effort evolved into what became known as "The Adventure System".

Current versions of "The Adventure System" have been fully implemented in machine language by Bruce Hansen and are, so far, fully compatible with the Scott Adams effort. "The Adventure System" is available to anyone who cares to send The Alternative Source enough money to buy it.

I mentioned that this system requires you to learn a new language. What follows is a discussion of the language and how it is used to create an Adventure which looks just like a Scott Adams' original.

"The Adventure System" requires you to specify the following details when entering your data:
(a) Objects.
(b) Messages.
(c) Rooms.
(d) Vocabulary.
(e) Actions.
(f) Header information.

OBJECTS

Each object specified in the data must contain three parameters: object number, starting location and object description.

The object number is specified by the Adventure Editor when you first enter the information. The first object will always be numbered 0 (zero) and the last object will always be numbered one less than the total number of objects.

The starting location is the number of the room in which the object will be placed at the beginning of the Adventure, i.e. if you specify 3 then the object would initially be located in Room 3.

The object description tells you what the object actually is, whether it can be manipulated and whether or not it is a treasure.

Consider the following three objects:
0: 3 Pile of rocks
1: 5 Large rock/ROCK/
*2: 4 *SPARKLING DIAMOND*/DIAM/*

Object number zero will be found when the adventurer goes into Room 3 with the above description displayed by the Adventure Driver. The object cannot be manipulated.

Object number one will be found in Room 5. The provision of the short description between slashes tells the Adventure Driver that this object may be manipulated, i.e. picked up, thrown, whatever.

Object number two will be found in Room 4. This object can be manipulated. The leading asterisk in the object description tells the Adventure Driver that this object is a Treasure. Object two would be taken into account for scoring purposes if you placed it in the Treasure Room.

As you can see, there is nothing difficult about specifying objects.

Object number 13 is reserved for the artificial light source, viz. lamp, matches, etc.

MESSAGES

Specifying messages is even simpler than objects. The Adventure Editor will specify suitable numbers when you first enter the messages. Message 0 is reserved so your messages will always start at number one.

A sample message would appear as follows:
1: There is a fly in my soup.

This message would be printed

whenever the driver was required to print message number one.

ROOMS

The parameters required when entering Room details into the Editor are Room Number (given by the Editor), allowable directions and Room description.

When entering Room details the Editor will ask for six Room numbers corresponding with Rooms which may be entered from the current Room. These numbers will also correspond with the directions North, South, East, West, Up and Down.

The Room description determines what the Driver will print when you are in a particular Room.

Consider the following two Room descriptions:

```
1: 0 5 23 0 0 0 large crate
2: 0 0 0 12 6 0 *I'm outside the shop
```

Room number one leads into Rooms 5 and 23 by going South and East respectively. The Driver would show South and East as obvious when you are in Room 1. The actual Room description would be preceded by the phrase "You're in a".

Room number two leads into Rooms 12 and 6 by going West and Up respectively. The leading asterisk in the description prevents the default phrase being printed.

It is important to note that the allowable directions can be overridden by allowing the adventurer to move to another room by specifying a suitable command, i.e. GO SHED.

If the adventurer moves in an illegal direction when a light source is available, he will receive the message "I can't go in that direction". If he moves in an illegal direction in the dark, he will be killed.

The last Room is reserved for a "Limbo" state when the person has been killed, and may or may not have exits into other rooms.

VOCABULARY

The vocabulary details all verbs and nouns which may be used in the Adventure.

Predefined Verbs are as follows:

0	AUTO
1	GO
10	GET
18	DROP

Predefined Nouns are:

0	ANY
1	NORTH
2	SOUTH
3	EAST
4	WEST
5	UP
6	DOWN

Primary vocabulary words may have as many synonyms as required but these must follow the relevant primary word and must each be preceded by an asterisk, i.e.

7	DOG
8	*HOUND
9	*BASSET

ACTIONS

Actions are the heart of an Adventure and are where newcomers to "The Adventure System" will have the most difficulty.

Action entries contain the following information:
Verb, Noun, Conditions, Commands and Action Titles.

Action Titles simply document the function of a particular entry. They act as comments and may be omitted, although as with any programming language, it is a good idea to liberally comment source code.

The verb and noun entered by the adventurer are used to determine which conditions and commands will be acted on. For example, if the adventurer were to enter "CLIMB TREE", the Driver would only consider those Action entries with the verb, noun combination of "CLIMB TREE". Of course, if "CYPRESS" had been defined as a synonym of "TREE", then "CLIMB CYPRESS" would also be acceptable in the example given.

The "conditions" of an Action entry provide a list of test which must be passed in order for the "commands" of the Action entry to be carried out. The "commands" of the Action entry are only carried out if all the "conditions" are met.

Before describing a few Action entries I will discuss the available "conditions" and "commands".

CONDITIONS

PAR	*This condition always passes and is used to pass a parameter onto a commend. The analogy with BASIC is the 'DATA' statement.*
HAS	*This conditions passes if the adventurer is carrying the object referred to, i.e. HAS 15.*
IN/W	*passes if the adventurer is in the same Room as the numbered object, i.e. IN/W 15.*
AVL	*passes if the adventurer is in the same Room as the object or is carrying the object.*
IN	*passes if the adventurer is in the numbered Room, i.e. IN 5.*
—IN/W	*passes if the numbered object is either held by the player or is in another ROOM, i.e. —IN/W 15*
—HAVE	*passes if the player is not carrying the numbered object.*
—IN	*passes if the player is not in the numbered Room.*
BIT	*passes if the numbered bit flag is set.*
—BIT	*passes if the numbered bit flag is cleared.*
ANY	*passes if any objects are being carried.*
—ANY	*passes if no objects are being carried.*
—AVL	*passes if the numbered object is in any other Room.*
—RMO	*passes if the numbered object is not in Room zero.*
RMO	*passes if the numbered object is in Room zero.*
CT< =	*passes if the counter is less than or equal to the number specified.*
ORIG	*passes if the numbered object is in the same room it started in.*
—ORIG	*passes if the numbered object is not in the same Room it started in.*
CT=	*passes if the counter is equal to the number specified.*

(Any numbers input with a condition must be in the range 0-1600)

COMMANDS

0	*This is a "null" command.*
1-99	*Display messages 1-99.*
GETX	*If this followed a PAR 5, then object number 5 would be picked up.*
DROPX	*If this followed a PAR 5, then object number 5 would be dropped.*
GOTOY	*If PAR 22 was specified, the player would be moved to Room 22.*
X-RMO	*PAR 5 would cause object 5 to be moved to Room zero.*
NIGHT	*Sets the light/darkness bit flag (15). If the artificial light source is unavailable the Room will be dark and no Room description will be given.*
DAY	*Clears the light/darkness flag.*
SETZ	*PAR 4 would cause bit flag number 4 to be set.*
X—>RMO	*PAR 5 would cause object 5 to be moved to Room zero.*
CLRZ	*PAR 4 would cause bit flag number 4 to be cleared.*
DEAD	*Clears the light/darkness flag, moves the player to the last Room and tells him he is dead.*
X—>Y	*PAR 5 PAR 22 would cause object number 5 to be moved to Room number 22.*
FINI	*Indicate that the game is over and enquire about a replay.*
DSPRM	*Display current room if it is light or the artificial light source is present, else display "It's too dark to see".*
SCORE	*Display number of treasures in the Treasure Room and the percentage of treasures stored.*
INV	*List inventory.*
SETO	*Set bit flag zero.*
CLRO	*Clear big flag zero.*
FILL	*Refill the artificial light source.*
CLS	*Has no effect but was included to maintain compatibility with the original BASIC system.*
SAVE	*Save the game to disk or tape depending on the version.*
EXX,X	*PAR 5 PAR 15 would cause the location of object number 5 to be swapped with the location of the object number 15.*
CONT	*Allows continuation of an Action entry.*
AGETX	*PAR 5 would enable object number 5 to be obtained even if the carry limit has been exceeded.*
BYX—>X	*PAR 5 PAR 15 would cause object number 5 to be placed in the same Room as object number 15.*
CT-1	*Subtract one from the counter value.*
DSPCT	*Display current value of the counter.*
CT<—N	*PAR 100 would set the counter to a value of 100.*
EXRMO	*Exchange the current Room number with the Room number held in Alternate Room Register zero.*
EXM,CT	*PAR 5 would cause the value of the current counter to be exchanged with counter number 5.*
CT+	*PAR 60 would add 60 to the current counter.*
CT-N	*PAR 10 would subtract 10 from the current counter.*
SAYW	*Display the noun (second word) input by the player.*
SAYCR	*Start a new line on the display.*
EXC,CR	*PAR 2 would cause the current Room number to be swapped for the Room number currently held in Alternate Room Register number 2.*
DELAY	*Pause for about 1 second before going on to next command.*

EXAMPLES

To discuss all of the possibilities inherent in the above would take a year's issues of this magazine so I will just give a few examples from the Manual.

```
0: AUTO 100  -BIT 1  PAR 1  0  0  0
MSG 1     SETZ    —    —    INTRO
```

The 0: shows that this is Action 0. AUTO 100 causes this action to be considered all of the time. When the Adventure is started, all bit flags are clear. In this case -BIT 1 would therefore be true. PAR 1 passes the parameter 1 to the *commands. The 0's indicate that there are no more conditions to be met. MSG 1 causes Message Number 1 to be printed. SETZ obtains the parameter of 1 from the PAR 1 condition and therefore sets bit flag number 1. Unless bit flag number 1 is cleared at a later stage by a different command, this is the last time this command will be executed. The dashes indicate that there are no more commands in the Action entry. INTRO is simply a comment.*

```
11: GET    KEY    IN/W 12    PAR 12
0   0   0   GET    MSG 5    —    —
```

If the player were to enter "GET KEY" this Action entry would be considered. If the player is in the same Room as the key (IN/W 12) the parameter of 12 (presumably the object number of the key) would be passed to the GETX command which would cause the player to pick up the key. Message 5 would then be printed. Note that if the player was already carrying the key he would automatically get the message "I'm already carrying it".

```
14: GO DOOR IN 2   PAR 3   0   0   0
GOTOY        MSG 5        —        —
```

If the player was to enter "GO DOOR" then, provided he was currently in Room 2, the parameter of 3 would be passed to the GOTOY command and the player would be moved to Room number 3. Message number 5 would be printed.

These are only three examples. However, by studying these examples and also the conditions and commands summarised earlier, you will see that the scope provided within "The Adventure System" is indeed comprehensive.

HEADERS

The best way to explain the header is to give an example from the manual.

```
Adventure Z Version 1.01 14500
bytes free
   Bytes under 16K = 7523
 #OBJ     #ACT     #VOC      #RM
  14       41       22        8
 MAX      BEG      #TR      WLEN
  5        1        1         4
 TIME     #MSG     TR-RM
 999       16       7
```

The name of the Adventure is "Adventure Z" and the version number is 1.01. There are currently 14,500 bytes free, although for any particular Adventure this would depend on your computer's configuration and the presence of any high memory drivers. There would be 7523 bytes free if this Adventure was entered as a SYSTEM tape in a 16K computer. There are 14 objects and 41 actions. There are 22 verbs and 22 nouns (although one might be less). There are 8 Rooms. The adventurer can carry a maximum of 5 objects. The adventurer will begin in Room number 1. There is only one treasure. The number of significant letters in nouns and verbs is four. The time limit is 999 moves. There are 16 messages. The treasure room is Room number 7.

All of this information is entered when you commence compiling the Adventure.

ADVEDT LIMITATIONS

The following limitations (if you can call them that) are imposed on the data entered into the ADVEDT program:

(1) Maximum of 500 Action entries.
(2) Maximum of 150 vocabulary entries (150 verbs and 150 nouns).
(3) Maximum of 100 rooms.
(4) Maximum of 99 messages.
(5) Maximum of 250 objects.
(6) Maximum characters in description of object, room or message is 255.
(7) Maximum word length of vocabulary words is 7 characters.
(8) Maximum length of Action titles is 20 characters.

To give you a comparison, the following are the maximums from the Scott Adams Adventures:
270 Action entries.
80 Vocabulary words.
100 Objects.

WHEREDAYAGEDDIT???

As far as I am aware, "The Adventure System" is only available from The Alternate Source, 704 N. Pennsylvania, LANSING, MI. 48906 U.S.A. The cost of the program is $US49.95 plus postage. If you write to them to ask about the cost of airmail, make sure you enclose some international reply coupons.

WADDAYAGET???

Before I tell you what you get, I should point out that you will need to have 48K of RAM available. There are versions, however, for both disk and tape.

If you order the tape version you will get two programs. ADVEDT — the actual Adventure Editor and ADVTT which will enable you to create a SYSTEM tape from any Adventure data base you create. The disk version also includes ADV which is a disk based Adventure driver. ADVEDT in both versions contains ADV so when you are writing Adventures you can jump back and forth between the Editor and Driver.

Each version also includes a short Adventure which is fully explained in the documentation as well as two full length Adventures.

The documentation is supplied in a sturdy black vinyl binder. The original manual was somewhat hard to follow in parts. However, there is now a much more detailed manual which just about ranks alongside Bruce Hansen's excellent "TASMON" documentation for ease of use and clarity.

WHAT? IS THERE MORE?

Also included is Issue No. 1 of the Auggies newsletter "Augment". If you buy "The Adventure System" you are entitled to join the Auggies (Adventure User Group). For $US12.00 per year (extra for airmail) you receive the "Augment" quarterly which includes at least one Adventure. You are eligible to market your Adventures through The Alternate Source, provided they are suitable, and thereby derive royalties. You can also purchase any Adventures created with "The Adventure System" at a discount.

The Alternate Source also have the following Adventure utilities available for purchase. ADVTAPE is similar to ADVTT and will create a SYSTEM tape from a disk data base. This avoids having to save the data base to tape first. ADVCOPY will take the Adventure off a protected Scott Adams Adventure disk and place it on an unprotected disk. ADVDUMP will read in a tape Adventure and dump the data base to disk. You have to be an Auggie to get these utilities.

I could quite easily go for a lot longer. There is so much that I haven't even touched on.

To summarise, if you like playing Adventures or if you are at all interested in writing Adventures, then you should definitely buy "The Adventure System". You won't regret it!

A REVIEW OF THE TRS-80 MC-10

(COLOUR COMPUTER)

by Charlie Bartlett

It never ceases to amaze me how computers are getting smaller all the time. When the Model 1 TRS-80 came out, it was thought to be incredible that a computer was actually crammed underneath the keyboard. Now we have the TRS-80 MC-10 upon us and it makes the Model 1 TRS-80 look like an Elephant or maybe a Dinosaur would be more appropriate consindering that the Model 1 is out of production.

The MC-10 is 2 inches high, 8½ inches long and 7 inches wide, (51mm x 216mm x 178mm), and weighs in at 29½ ozs (836.32 grams). The Microprocessor is an 6803 and is not fussy about spaces around keywords as is the 6809E in the Colour Computer, which is just as well considering the 3142 bytes of memory available in the MC-10. I was quite surprised at the number of commands that such a small machine supports, in fact it has NEARLY as many commands as the unextended Basic in the Colour Computer. After some digging around in the memory I also found some commands that it supports that are NOT in the manual, more on this in a minute. Listed below are commands that are available, (as listed in the manual).

ABS	Computes absolute value.
ASC	Returns ASCII code of first character of string.
CHR$	Returns character for ASCII or graphics code.
CLEAR	Reserves bytes of string storage.
CLOAD	Loads Basic program from cassette.
CLOAD*	Loads numberic data into an array from cassette.
CLS(x)	Clears display to specified colour "x".
CONT	Continues program execution if BREAK has been pressed.
COS	Returns cosine.
CSAVE	Saves a Basic program to tape.
CSAVE*	Save contents of a numeric array to cassette.
DATA	Stores data in your program.
DIM	Dimensions an array.
END	Ends program.
EXP	Returns natural exponential
I	Exponentiation character.
FOR	: Creates
TO	: a loop
NEXT	: in a program.
STEP	: with step to increment.
GOSUB	Sends computer to subroutine.
GOTO	Sends computer to a line.
IF/THEN	Test a relationship.
INKEY$	Strobes the keyboard and returns the key being pressed.
INPUT	Computer waits for input from the keyboard.
INT	Converts a number to an integer.

LEFT$	Returns left portion of string.
LEN	Returns the number of characters in a string.
LET	Assigns value to variable (optional).
LIST	Lists program lines on screen.
LLIST	Lists program lines to printer.
LOG	Returns natural logarithm.
LPRINT	Prints an item on the printer.
MEM	Returns the amount of free memory.
MID$	Returns a substring of another string.
NEW	Erases memory contents.
ON × GOSUB	Multi-way branch to specified subroutines.
ON × GOTO	Multi-way branch to specified lines.
PEEK	Returns contents of a memory location.
POKE	Puts value into specified RAM location.
POINT	Tests whether a graphic cell is on or off.
PRINT	Prints to screen, abbreviation of ? is available.
TAB	Moves cursor to specified column.
PRINT @	Print at specified location.
READ	Reads the next item in a DATA line.
REM	Remark.
RESET	Erase dot that was SET.
RESTORE	Resets DATA pointer.
RETURN	Returns computer from a subroutine.
RIGHT$	Returns right portion of string.
RND	Return pseudo random number.
RUN	Executive a program.
SET	Sets a dot at a specified location to a specified colour.
SGN	Return sign of specified number.
SKIPF	Skips to end of next program on cassette.
SIN	Returns sine.
SOUND	Sound specified tone for specified duration.
STOP	Stops execution of program.
STR$	Converts a number to a string.
SQR	Returns the square root of a number.
TAN	Returns tangent.
VAL	Converts a string to a number.

Quite a powerful Basic for its size isn't it, the following command are not listed in the manual or anywhere else for that matter.

VARPIR	This command has the normal syntax of A = VARPTR (B$) and it works, so I don't know why it was not mentioned.
USR	This command is supported by the Basic interpreter though at the moment it is not much use until some technical information becomes available to find out where to poke the entry points.
EXEC	This command also has the normal syntax of EXEC addr where "addr" is the entry point of a machine language program or subroutine.
CLOADM	This command will load a machine language program into memory and has the syntax of CLOADM "filespec" or CLOADM "filespec", addr where "addr" is the position in memory that the routine is to be loaded to.

As far as I could determine the command CSAVEM is NOT supported, (that is unless it has a very different syntax from normal), I tried several variations on the syntax and nothing worked. If that is the case it would seem that Tandy have been very crafty, you can load a machine language tape but you cannot save one. Now you ask, if that is the case how did I determine that CLOADM works, since there are no machine language programs for the MC-10 at this time.

Well for a start CLOADM does not return a syntax error, it switches on the cassette, clears the screen and prints an "S" at the top of the screen indicating that it is searching. If a BASIC program is encountered it returns an FM error (file mode). If a machine language tape from the Colour Computer is encountered it happily loads in the file name and only fails with an I/O error when the 6809E code is encountered. Which leads me to believe that given a MC-10 machine language file, it would load.

What use are VARPTR, EXEC and USR, well even if you cannot save a pure machine language program, there is no reason why you could not have a BASIC program with machine language poked into the lines with the help of VARPTR or you could have your machine language in DATA statements and poke this into memory and then EXEC to execute.

Video Memory is from 16384 to 16895, other addresses also work in tandem, the reason for this is not understood. Some keyboard addresses are in the region of 16940 and up, for example the address 16952 is used by the space bar and returns a value of 247 when the space bar is pressed, if you write a program where you want something to happen — FOR AS LONG AS the key is held instead of IF the key is pressed then you can read this memory location for the value and if the value is found poke zero into it so that on the next pass, if the key is still held down it will return the original value and if not it will return zero, this procedure applies to the other memory locations in this area.

Blindly poking into various memory locations brought interesting responses that would seem to indicate that with some detailed information higher resolution graphics might be possible. Try poking location 20 (decimal) with different values to see what I mean, (it locks the machine up though and you will have to press the reset button).

Having a Colour Computer here, I thought I could save some typing time by loading a Colour Computer Basic program, I thought I was on to a good thing for a while since the Colour Computer and the MC-10 will both load each other's tapes. However, unfortunately different values are used for the keywords in both machines so what is loaded in has the same line numbers but all of the keywords are swapped around, pity!!

The MC-10 has a DIN socket for a cassette, no cassette cable is supplied, but if you have a Model 1 or a Colour Computer you can use the same cable as the pin connections are the same. It also has an RS232 DIN socket, this also has the same pin configuration as the Colour Computer.

To sum up, it is a very nice little machine at a reasonable price, the only thing lacking at the moment seems to be the software.

INPUT/OUTPUT

FROM: R.J. Mclean-Formartin, Qld.

I own a System-80 on which I am using a Tandy green screen monitor. At times the display shivers and this makes it difficult to read. However, if a key is pressed (a character entered), or the NEWLINE key is depressed the shivering stops. Would you have any idea of a solution to this problem?

(It sounds like you have an intermittent fault of some sort and you should refer the problem to a qualified technician for repair. — Ed.)

FROM: Mr. G. Whitcher—Yunderup, W.A.

It would be helpful if programs that use USR calls were printed with the necessary information to convert from Level 2 BASIC to Disk BASIC for those of us who are too mean to buy the Disk subscription for the sake of a few programs which may be of interest. I only subscribe to the casette subscription for the ease and not having to type the programs that interest me.

(Your point is well taken and we would like to include the information needed to modify Level 2 programs with USR routines so that they will work with Disk BASIC but we do not have the time to dissect machine language routines that are only provided in object format or the BASIC equivalent. If the program author would supply commented assembly language source code for the USR routine, we would be happy to publish that along with the program listing and any relevant suggestions for disk users.

RECALL on the disk version of SOFTPAK is intended to overcome this difficulty in most cases by running the Level 2 program in the Level 2 environment. However, there are those cases where modifying the program for disk BASIC is the preferred solution.—Ed.)

FROM: Mr. J. Linton—Malabar, N.S.W.

As the SYSTEM 80 is going out of production, is there an alternative expansion system to allow update to disk drive or do I have to buy a SYSTEM 80 expansion unit before they go out of production?

(By now you will probably know the answer to this question as it is discussed in the Editorial. Briefly, MICRO-80 will have expansion interfaces for the System 80 available about the end of February, 1984. — Ed.)

SOFTWARE

AUSTRALIA'S CUP —L2/16K

by Carl Cranstone

Australia recently won the America's Cup which the Americans had held for 132 years. The Australian yacht "Australia II" broke the longest winning-streak in sporting history by defeating the American yacht 'Liberty' four wins to three. Every Australian can now relive that day (or should I say, early morning!) by playing the Australia's Cup game!!! Up to six people can play and place bets on the outcome of the races. Complete instructions on how to play are included in the program.

HOW TO GET THE PROGRAM RUNNING(?)

To get the program 'Australia's Cup' running, those of you who are entering the *program from the magazine will have to follow my instructions below to the letter (or at least to the word!). There are three programs that I have written for this game. The first AUSCUP/LST is the Australia's Cup program in its raw form (i.e. it contains no graphics). The second is AUSCUP/DAT which is a program that creates the program lines that contain the graphics. The third is AUSCUP/LNW which is an LNWBASIC Program to enable LNW-80 owners to see Australia's Cup in colour.*

1. AUSCUP/DAT

This program reads in the data for the graphics and POKEs it into memory — creating assembled strings. (Exactly the same as those created by Charlie Bartlett's Graphic Assembler program — issue 5 April 1980).
****STEP ONE: Type in the AUSCUP/DAT program and RUN it*
****STEP TWO: delete lines 1 & 2*
****type LIST:— you should see something resembling a garbaged program. Don't worry! This garbage is really assembled strings.*
****SAVE or CSAVE the strings immediately!!!*

2. AUSCUP/LST

This is the program which uses the strings.
****STEP THREE: LOAD OR CLOAD the strings and type in this program around the strings. You will notice that lines 1350 and 1560 in this program are reserved for the strings.*
****STEP FOUR: When you have typed in the program around the strings SAVE or CSAVE it immediately. (This program will now be known as AUSCUP/BAS).*
WARNING: BE VERY CAREFUL THAT YOU DO NOT ACCIDENTALLY ERASE A LINE WITH AN ASSEMBLED STRING IN IT OR EDIT IT. THIS CAN RUIN ALL OF YOUR HARD WORK!!!
****STEP FIVE: LOAD or CLOAD the program in and RUN it. The first thing you should see is a large map of Australia. You must press ENTER to continue into the game. If you don't, the game will go into Demo Mode. To start the game you must press ENTER from the map. If you press ENTER from the Demo Mode, you will return to the map.*

3. AUSCUP/LNW

This is for the benefit of LNW-80 owners who want to see Australia's Cup in colour.
****STEP SIX: Type in the AUSCUP/LNW program and RUN it.*
****STEP SEVEN: Press Break and then type in the following line:*
FLS:SAVE"AUSCUP/GRF:d":
PLOAD"AUSCUP/GRF:d"
where :d is drive number.
This will fill the screen enabling you to see the colour. The /GRF file will be saved and reloaded again so that you can verify that you have a good save.
For those who don't want colour, you will have to delete the following statements from the program:
Line 10 'OUT254,0:'
Line 140 'OUT254,116:'
Line 530 'OUT254,0:'
Line 630 'OUT254,0:'
A typical chain file to load in the colour would be as follows:
(Newdos80 2.0 users use CHAINBLD/BAS)
LNWBASIC PLOAD"ASUCUP/GRF"
CMD"S=BASIC"
RUN"AUSCUP/BAS"
NOTE: AUSCUP/BAS is the resulting program when AUSCUP/DAT and AUSCUP/LST have been merged into one program.

GRAFX
L2/32K Disk

by Bob Wilson

WHAT IS GRAFX?

GRAFX is a tool for use in generating bold titles or graphics for incorporation in programs.
Once you have designed your titles or graphics, GRAFX will write a BASIC program to reproduce them.

INITIAL SET-UP

If you are typing this program in from the magazine, you must first type in the INIT program and run it. The INIT Program creates a disk file called BIGLTRS. This file gives GRAFX the ability to produce the big letters. GRAFX will require the BIGLTRS file to be on disk before it will run; once the INIT program has been run you will not need it again. If you are a disk subscriber you will not need to run INIT as the BIGLTRS file is already on your disk. The INIT program is also on the disk in case you should want to use it.
Make sure you have plenty of free disk space for the programs that GRAFX will write for you. Better still, prepare a disk containing only your operating system, GRAFX and BIGLTRS and initialize your AUTO command as BASIC RUN"GRAFX".
If you use NEWDOS 80 Ver 2 as your DOS you can run the program as it is. If you use another DOS, you will need to delete the last statement from line 80 of the program. The statement to delete is CMD"F",DELETE 10-70
Your Disk is now ready to run GRAFX on power-up or RESET.

USING GRAFX

Power-up or RESET with your GRAFX Disk in Drive 0.
GRAFX will grab as much of your memory as possible for use in string manipulation when it writes programs. It will do this calculation for itself. The program writing operation will take longer on a 32K '80 than on a larger machine, because the string area management functions (when string space becomes full) will operate more often.
Fifteen lines of your screen will be available for you to use in designing your titles or graphics. The bottom line is used for prompting you and to advise you of the current mode of operation.
After the initialization routine, the program will display the COMMAND MODE prompt line on the screen.

GRAFX COMMANDS

In COMMAND MODE the prompt line displayed is:
(C)lear (G)rafx (H)uge (S)lave (R)ecall (P)rogram (E)nd
The appropriate letter (C G H S R P or E) will select the various functions:
GRAFX mode
In GRAFX MODE you have several options available:

(C)ursor Mode	*: Use the arrow keys to move the cursor*
(D)raw Mode	*: Use arrows to draw lines*
(E)rase Mode	*: Use arrows to erase lines*
(T)ext Mode	*: Enables text to be entered starting at the current cursor position*
e(X)it	*: Returns you to COMMAND MODE.*

HUGE LETTERS MODE:

Enables HUGE letters to be entered for titles.
Screen capacity is 80 characters and the Character Set available is:
ABCDEFGHIJKLMNOPQRSTUVWXYZ
123456789!?;:,.

NOTES

Input always starts at the top left of the screen.
If you reach the bottom of the screen, the top line will be scrolled off the screen and lost.
The screen will be cleared on entering this mode. Enter HUGE LETTERS BEFORE entering GRAPHICS.
To exit this mode enter SHIFT/BACKSPACE.
SAVE and RECALL MODES:
On selecting either of these modes you will be asked for a screen number.
The screen contents (15 lines) will be SAVED to, or RECALLED from, the screen memory you select and you will be returned to command mode.

PROGRAM MODE

You will be asked for one letter to be included in the FILESPEC. Your letter will appear as the 'x' in the followiing filespec:
TITLEx/GFX
A BASIC program will be written to reproduce the current screen constants, and will be dumped to disk in ASCII format.
The program created will contain 4 lines which will create and print a series of strings from data contained in the subsequent lines.
The END command terminates the running of GRAFX.

SOURCE UTILITY
Model 3 Disk

by T. Domigan

SOURCE/BAS is a program to transfer EDTASM source files between tape and disk for Model 3 users of NEWDOS80 V2.0.
APPARAT discontinued support for Tape I/O in EDTASM for the Model 3 as they were concerned with the unreliability of tape. Whilst object code can be moved between tape and disk with LMOFFSET, source files cannot. SOURCE/BAS fills this gap and also allows the copying of source tapes.
To use SOURCE/BAS enter the command "BASIC IV" from DOS. This special command is necessary as a non-standard logical record length is used to get the code from disk. Once you have entered BASIC, "RUN" the program.
The machine language section resides in the bootstrap stack area and therefore does not require memory size to be set. However, memory is protected by the program in line 20, from 8000H to F000H for the storage of up to 26K of text.
This program is fully-menu driven and is self-explanatory.
Tape I/O can be made at high or low speed as desired. Disk I/O will tend to be slow so have patience with large files.
Always exit the program via menu option 6 as this ensures that the disk file is closed and BASIC is correctly restored.

LVAR
L2/32K

by Tim Fish

This is an extremely useful debugging tool for BASIC programs. The program resides at the top of memory but, on first being run, it initialises the DOS exit for the Disk BASIC verb NAME to a jump instruction to its own start address. Type NAME from ROM BASIC now, instead of giving you an L3 ERROR, gives you a list of all the single precision, double precision, integer and string variables used in your program and their values. So when your BASIC program fouls up press BREAK (if necessary) and type NAME. The variables are displayed in "pages" of 15. Press any key for the next page. Array variables are not listed.

LOADING INSTRUCTIONS:
MEMORY SIZE ***32320***
SYSTEM **?* ***LVAR***
?* */ENTER*** *or* ***/32321***
> – load your BASIC program (tape contains a daft demo program)
RUN ENTER *. . .*
. . . ***(BREAK) NAME ENTER***

TRACK RACER
Hitachi Peach

by D.C. Kelly

In this race game you must steer your racing car down the track while avoiding the oncoming cars. You will crash if you run off the track or hit an oncoming car. The further you travel the greater your score. You steer the car using the left and right arrow keys. After you have crashed the program will display:
CRASH INS = PLAY AGAIN
DEL = FINISH

If you want another game press the INS key, otherwise press the DEL key.

HI-RES TEXT
Colour Computer

by Geoffrey D. Williamson

One of the most annoying features of the CoCo is its lack of a true lower case display. It does not take too many hours in front of the monitor to become thoroughly annoyed with Tandy's excuse for lower case!

Unfortunately, this is fixed by hardware, and one may resort to alternative hardware lower case drivers to overcome this problem. Alas, these are expensive; yet there is a cheap way out of this dilemma, thanks to MICRO-80; Just type in the following program and you will be able to have true upper and lower case on the screen at the same time. Not only that, but this text is usable at the same time as graphics — here come some graphic adventures!!

One final feature of this program is its relocatability — by this, we mean it can live anywhere in memory quite happily, as it is written in position-independent code which is much easier to do on the 6809 than most 8 bit microprocessors.

Because of this relocatability you can 'hide' the machine code program behind the BASIC program — this is achieved by a little driver attached to the program proper. The advantage of all this is that once the whole program is set up, it can ALL be loaded with one (C)LOAD, as if the machine code where not there!

This program is fully compatible with disk systems and 16K or 32K of memory. With it, you can use the PRINT@ command as you would on the text screen normally if the graphics screen is PMODE 4.

You can also use it with any start page, and there are some interesting effects in the coarser PMODE's — how about video titles using PMODEO or 2?

However, the PRINT@ statements will not work normally except in PMODE 4. If you crash out of the program abnormally, and are still on the graphics screen, just type A = USR1(0) to get back to the text screen.

Type in the demo BASIC program — it is certainly simple, but does give you an idea of what is possible.

PROGRAM DESCRIPTION

As the program is written in machine code it is very fast, and you would be hard up to find any slow down from that of the BASIC interpreter acting normally.

The source code is well commented and the remarks here are only intended for amplification.

The source code from line 120 to line 270 is all for relocating the machine code invisibly behind the BASIC program — invisible to the BASIC interpreter that is. Once that relocation is done the loader is dispensed with — in fact, it cannot be re-used — see line 250.

Lines 330 to 550 are for keeping tabs on the USR calls from the BASIC program. There is provision for two USR calls. The first (USRO) turns on the graphics display, and the second (USR1) turns it off. The code in this section is there to make sure that all errors from errant BASIC programmers are properly trapped!

The main code starts at line 610, and is commented extensively in the listing. You will note that no control characters are allowed in the listing, but these could be easily added if yo uwished to work out their parameters for the look up table.

SET UP

1. *Take very careful note of the addresses in the object code in the first twenty or so lines of code. If you are using Tandy's EDTASM+ to assemble this program you MUST force the assembler to use the direct page mode of addressing by using the < symbol. If you do not, the assembler will default to extended page addressing. This will slightly slow the code down, but more importantly, the addresses I have given in the demonstration program for the USR calls (and for the loader program) will be incorrect.*

   There is nothing sacrosanct about the values in the program, but be prepared to spend a fair bit of time in debugging if you do not stick slavishly to them!
2. *Once you have the machine code safely assembled (and backed up) CLEAR some space at the top of RAM — if you have 16K try CLEAR200,&H3000: or CLEAR200,&H7000 for 32K. (C)LOADM the machine code into this area with the APPROPRIATE OFFSET. Remember, it is ORG'd at zero. If you forget the offset, you will bring down your whole system!*
3. *Now that the machine code is safely tucked away in protected RAM you can load in your BASIC program. Once you are happy with the latter you can go to the next step.*
4. *EXEC the machine code program. This places it behind the BASIC program and the WHOLE program can now be (C)SAVE'd like a normal BASIC Program.*
5. *RUN you new creation — I hope it works!!*

THE KILLER SATELLITE
(COLOUR)

by Scott Edwards

"The Killer Satellite" is an original action game for the 16K, extended basic, colour computer. It should run oin all colour computers with extended colour basic.

A war satellite in space has malfunctioned and is sending its deadly cosmic rays at Earth. You must protect Earth by destroying these rays until the satellit runs out of energy.

The cosmic rays are represented by a random sequence of coloured squares, all rapidly approaching your ship. The "colour" of your ship can be varied by pressing the space bar. By matching the colour of your ship to the components of the beam, portions of the beam (or ray) can be destroyed. If you destroy the whole ray, you go to the next level where a new ray moves faster. If the deadly beam reaches your ship, you are destroyed.

To begin the game you have 3 ships, and extra ships are obtained as you progress through the various levels. If all of your ships are destroyed before the satellite fails, the satellite destroys the Earth and you lose. On the other hand if you can protect the Eart for 11 rounds, the satellite runs out of power and the Earth is saved.

All this makes for an entertaining game which becomes quite difficult at the higher levels. For added interest a score is displayed at all times. If a ship is destroyed you continue on the same level until you are successful or otherwise.

To use the program simply type RUN, read the introduction, then hold down any key until the game begins. From then on simply use the spacebar to match the colours — Good Luck.

The functioning of the program is explained below:

Line 60, 70:
Generate initial display
Line 90, 100:
Generate the strings for the number of ships left, and the colour sequence of your ship.
Lines 110, 120:
Complete initial display
Lines 130-150:
Print scenario
Lines 160, 170, 180:
Flash screen, wait for continue
Line 200:
Initializes variables
Line 210:
Go to round generation
Lines 240-290:
Loops for colour mate between ship and ray by using INSTR ( ), then uses the MID$ ( ) functions availble in BASIC to manipulate the ray string.
Lines 310, 320:
Update display, and makes sound effects.
Line 340:
If 1st character of A$ = blank, ray is destroyed, you win this round.
Line 370:
Update variables, if ray at your ship you lose round.

Line 390:
Go to beginning of loop — continue round.
Lines 420-480:
Check for spacebar being pressed, and change ship colour, if necessary. Also controls speed of ray.
Line 500:
New round, if you complete 11 rounds then you've won, otherwise generate stars.
Line 510:
If 5 successful rounds, get extra ship.
Line 520:
Print satellite
Line 530:
Print score, print round, generate ray.
Line 540:
Time delay and colour sequence.
Line 560:
Print remaining ships.
Line 580:
Destroy ship, same round again.
Line 590:
If last ship you lose
Lines 600-680:
You lost, wait for key.
Line 690, 700:
Another Game?
Line 720:
You Won.

Variable List:

A$	Cosmic Ray
B$	Colour sequence of ship
Q$	Displayed portion of A$ (usually)
X	Position of left portion of Q$ on screen
SH	Number of ships
R	Number of rounds
M	Score
G, SV, S	Determines speed of ray
S1	Used to determine when to get new ship
E	Length of Q$
C	Determines colour of ship
Y1, X1	Position of starts
Z, T, ZZ, V	Variables used for — next loops.

N.B. The use of INSTR$ ( ) and MID$ ( ) = . . . , both functions of extended BASIC allow this program to run at a reasonable speed. Therefore this program would be difficult to modify for computers without these special string handling routines.

HOUSEHOLD ACCOUNTING VER 4.2 & VER 5.0

This is an all new version of the earlier Household Accounts program published in MICRO-80 magazine. Input has been simplified, all bugs eliminated and, the program will load and save to disk or tape as required. The program will carry out many of the bookkeeping functions for a small business.

LOADING FROM CASSETTE

The program is written in BASIC. Simply position the tape to the start of the program, type LOAD, press RETURN and press the PLAY key on the recorder. The program will then load. When loaded, type RUN and press RETURN. The Household Accounting copyright message will be displayed together with the program menu.

FUNCTIONS

The following MENU is displayed when the program starts:

```
* * *  H O U S E H O L D  A C C O U N T I N G   VER 4.0  * *
* * *  (C)  07/07/83     M I C R O - 8 0   P T Y  L T D  * *

                              MENU

1 = KEYBOARD INPUT                   :  5 = SAVE DATA
2 = LOAD DATA                        :  6 = PRINT JOURNALS
3 = READ MEMORY                      :  7 = LINEPRINTER UTILITY
4 = EDIT MEMORY                      :  8 = LEDGER ACCOUNTS
```

1. KEYBOARD INPUT

This function is for the input of data and starts from record 1 and works up to the maximum record number for your system. Re-entry to this function when data is still resident in memory will cause the program to resume at the next record after your last entry (this also applies where a file is loaded from disk or tape). Your input is displayed next to the request for details. The cursor is displayed at the point where your entry is going to take place. The asterisks in each input field indicate the maximum number of characters that the field will accept. When a field has been filled, your input will move to the next field. You do not have to fill each field. When you have entered the information you require simply press RETURN and the program will move on to the next field. The only exception to this is the first input of DATE **/**/**. If RETURN is pressed in response to the first input field the program will return you to the menu.

The field "PREFIX" is used to indicate to the program the ledger into which the record is to be placed. This should be one of the following:

CP = Cash Payments Journal
CR = Cash Received Journal
GJ = General Journal
SJ = Sales Journal

Input to the numeric field of DEBIT and CREDIT must have leading zeroes, or blanks.
i.e. enter:
$10.10 as 00010.10
$10.01 as 00010.01
$1.10 as 00001.10
$101.10 as 00101.10

When all fields have been filled the program will respond with:
CORRECT (Y/N)

If 'N', the program will return you to the start of input for that record. If 'Y', the program, will respond by going to the next record. To return to the menu press RETURN in response to the DATE field input.

2. LOAD DATA

This function enables you to load a complete set of data. The program will display a menu giving you the choice of loading from cassette or disk, or of returning to the main menu should you have selected this function by mistake.

For either type of load the program will request an 8 character filename. In the case of a disk load the program will search all available drives for the file starting with drive 0.

In the case of a cassette load the program will read in the name of the first file found on the tape, if this does not match the filename you supplied the program will display the filename read from tape and abort the function.

After a successful load from either disk or cassette the program will return to the LOAD MENU.

3. READ MEMORY

This function scrolls ALL data stored in memory, up the screen.

4. EDIT MEMORY

This function is used to add new records, or to change the data stored in any one record. It uses the same input and display format as the keyboard input mode except that it gives several extra options:

Respond to the prompt SELECT with one of the following:

E	This will put you into edit mode. The input format is the same as the Keyboard input function EXCEPT that this time if the RETURN key is pressed at the start of an entry field, that field will remain unchanged and input will move to the next field.
;	This will increase the record count by one and display the next record.
+	This will increase the record count by ten and display a higher record.
–	This will decrease the record count by one and display the preceding record.
=	This will decrease the record count by ten and display a lower record.

RETURN in response to the SELECT * prompt will return you to the main menu.

5. SAVE DATA

This function enables you to save a complete set of records. The program will display a menu giving you the choice of saving to cassette or disk, or of returning to the main menu should you have selected this function by mistake. For either type of save the program will request an 8 character filename, write the file and return to the SAVE MENU. (You should make a note of the filename you use, particularly when saving to cassette, as the program requires the name when you wish to reload the data).

6. PRINT JOURNALS

This function enables you to print the four journals to the screen and to a printer (optional). Follow the instructions on the screen. Note: Do not attempt to use the printer option unless there is a printer connected to the computer. Pressing RETURN in response to the DATE prompt will cause all dates for that journal to be printed.

IMPORTANT NOTE

Before the Ledger Balances are calculated and printed, the records in memory are sorted according to Account No. This destroys the normal DATE-order sequence of the record in memory, which is the preferred order for all other printouts. **Make sure that you SAVE a copy of your data before using this function.**

7. LINEPRINTER UTILITY

This function allows direct interface between the keyboard and the printer, i.e. whatever is typed onto the screen will be printed as soon as the RETURN key is pressed. This utility is useful for setting up headings on reports. Note: Do not attempt to use this function unless there is a printer connected to the computer.

8. PRINT LEDGER ACCOUNTS

This function allows you to print the ledger accounts to the screen and to a printer (optional). Follow the instructions on the screen. Note: Do not attempt to use the printer option unless there is a printer connected to the computer.

USING THE PROGRAM

The program has the capacity to handle both single entry and double entry accounting systems. The benefit of the double entry system is that it provides a checking mechanism to indicate accuracy of input and processing and is the preferred system in maintaining financial records. However, the double entry system uses more records in recording the data thereby reducing the total capacity available for recording transactions.

For the purposes of this illustration the double entry system has been used.

Prior to using the program, it is necessary to establish a Chart of Accounts to accumulate transactions appropriate for the purpose of recording. Adequate allowance has been made for the number of ledger accounts (998) that may be used. The following example has been used to illustrate how the program can be used to record personal income and expenditure.

CHART OF ACCOUNTS

Balance Sheet of Items

Assets

1. *Land*
2. *Buildings*
3. *Household Furniture & Appliances*
4. *Motor Vehicles*

6. *Public Co. Shares*
7. *Bank Accounts*

Liabilities

11. *1st Mortgage*
12. *2nd Mortgage*

14. *Credit Charge Accounts*
15. *Friendly Finance Corp*
16. *Other Liabilities*

99. *Owner's Equity.*

Income and Expenditure Items

Income

51. *Husband's Salary*
52. *Wife's Salary*
54. *Dividends Received*
55. *Interest Received*
58. *Health Refunds*
59. *Other Income*

Expenditures

General

71. *Entertainment*
72. *Household Repairs*
73. *Housekeeping*
74. *Insurance*
75. *Motor Vehicle Costs*
76. *Subscriptions*
77. *Interest paid*
78. *Health Insurance*

Taxation Deductions

81. *Education*
82. *Medical Costs*
83. *Rates & Taxes*
84. *Trade Subscriptions*

To commence processing the transactions shown in the example the opening balances need to be entered. This is done via the keyboard input. For this purpose the General Journal (GJ) prefix is used.

(N.B. The print out of the General Journal processing demonstrates the self checking mechanism of the double entry system in showing that the total of debits and credits agree and that there is no imbalance. If a figure other than $0.00 is shown as the balance this indicates an error in processing has occurred and requires investigation and editing).

CASH RECEIPTS JOURNAL

```
CASH RECEIVED JOURNAL FOR ALL (DATE)'S
DATE      REF   DETAILS             ACC NO      DEBIT     CREDIT
15/07/83        MR. SALARY           CR051       0.00    1050.00
31/07/83        MRS. INCOME          CR052       0.00     600.00
01/08/83        DIV. A CO. LTD.      CR054       0.00     150.00
15/08/83        MR. SALARY           CR051       0.00    1050.00
17/08/83        HEALTH REBATE        CR058       0.00      10.60
27/08/83        BEQUEST NELLY        CR059       0.00   10000.00
31/08/83        INT. X CO. LTD.      CR055       0.00     450.00
31/08/83        MRS. INCOME          CR052       0.00     600.00
31/08/83        TOTAL RECEIPTS       CR010   13910.60       0.00

TOTAL                                        13910.60   13910.60
BALANCE         $0.00-
```

Normally for each receipt an entry is required to the Bank Account (debit entry) and the ledger account to record the nature of the income (credit entry). In this example only one entry has been made to the Bank Account for the total of the records processed. This has been done to demonstrate a way in which maximum availability of records can be maintained. To carry out this function return to the menu and select the "Print Journals" function and list the transactions to obtain the total of the input. Once obtained, return to the "Keyboard Input" function and process this total to the Bank Account using the "CR" prefix.

The comments noted above for Cash Receipts also apply here, except that the entry to the Bank Account for cash payments is a credit and entries to the expense accounts, etc. a debit.

CASH PAYMENTS JOURNAL

```
CASH PAYMENTS JOURNAL FOR ALL (DATE)'S
DATE      REF   DETAILS             ACC NO      DEBIT     CREDIT
01/07/83 0001   CAR SERVICE          CP075      43.24       0.00
10/07/83 0002   ENT-BILL MARY        CP071      75.40       0.00
15/07/83 0003   MICRO-80             CP076      85.00       0.00
15/07/83 0004   HOUSEKEEPING         CP073     400.00       0.00
31/07/83 0005   BUILDING INS.        CP074     230.63       0.00
31/07/83 0005   CONTENTS INS.        CP074     250.00       0.00
31/07/83 0006   A BANK - PRIN.       CP011      80.00       0.00
31/07/83 0006   A BANK - INT.        CP077     718.75       0.00
31/07/83 0007   A SBANK - PRIN.      CP012     100.00       0.00
31/07/83 0007   A SBANK -INT.        CP077     533.00       0.00
31/07/83 0008   FRIENDLY FINAN.      CP015    1000.00       0.00
01/08/83 0009   DR. WHO              CP082      10.60       0.00
01/08/83 0010   FRIENDLY FINAN.      CP015    9000.00       0.00
01/08/83 0011   A SBANK - PRIN.      CP012    1000.00       0.00
10/08/83 0012   SCH. FEES - ANN      CP081     100.00       0.00
15/08/83 0013   COUNCIL RATES        CP083     212.10       0.00
15/08/83 0014   HOUSEKEEPING         CP073     400.00       0.00
31/08/83        TOTAL PAYMENTS       CP010       0.00   14238.72

TOTAL                                        14238.72   14238.72
BALANCE         $0.00
```

LEDGER BALANCES (TRIAL BALANCE)

```
ACC NO.       DEBITS            CREDITS          TOTAL
 001        10000.00              0.00         10000.00
 002        65000.00              0.00         65000.00
 003        25000.00              0.00         25000.00
 004        19000.00              0.00         19000.00
 006         5000.00              0.00          5000.00
 007        15000.00              0.00         15000.00
 010        14135.76          14238.72           102.96-
 011           80.00          25000.00         24920.00-
 012         1100.00          40000.00         38900.00-
 015        10000.00          10000.00             0.00
 051            0.00           2100.00          2100.00-
 052            0.00           1200.00          1200.00-
 054            0.00            150.00           150.00-
 055            0.00            450.00           450.00-
 058            0.00             10.60            10.60-
```

```
  059           0.00           10000.00         10000.00-
  071          75.40               0.00            75.40
  073         800.00               0.00           800.00
  074         480.63               0.00           480.63
  075          43.24               0.00            43.24
  076          85.00               0.00            85.00
  077        1251.75               0.00          1251.75
  081         100.00               0.00           100.00
  082          10.60               0.00            10.60
  083         212.10               0.00           212.10
  099           0.00           64225.16         64225.16-

TOTAL      167374.48          167374.48             0.00
```

This facility summarises the balances of all active ledger accounts showing the total debit and credit entries and the balance of each account. Validation of the processing is ascertained when the total debits and credits are the same amount and the total equals 0.00. If the total does not equal 0.00 an imbalance has occurred which requires checking and correction.

Normally, each of the four journals would be individually checked prior to performing a trial balance to ensure that each journal is itself balanced. The trial balance is then merely a formality and should show no imbalance.

IMPORTANT NOTE

Before the Ledger Balances are calculated and printed, the records in memory are sorted according to Account No. This destroys the normal DATE-order sequence of the records in memory, which is the preferred order for all other printouts. **Make sure that you SAVE a copy of your data before using this function.**

LEDGER ACCOUNTS

This function enables each individual account to be printed showing all the transactions processed to that account. For the purposes of illustration the Bank Account (#10) and the Interest Paid Account (#77) are listed below.

To obtain a complete print out of ledger accounts it is necessary to input each account number in response to the "Which Account Number do you require" question.

In cases where the record maximum is reached this can be overcome by obtaining a print out of all journals and ledger accounts for retention as a permanent record and repeating the procedural functions outlined above.

This commences by clearing the memory and inserting the closing balances for each ledger account via the General Journal prefix.

The program provides great flexibility as to the types of accounts that may be incorporated into the chart of accounts. Your requirements can be specifically designed for your own particular circumstances. The design and allocation of account numbers should be thoughtfully considered prior to commencement as any subsequent change in account numbers for particular purposes will require the editing of prior transactiuons to accounts affected.

SALES JOURNAL

The Sales Journal will often not be applicable in the normal household situation. It is, of course, useful for a small business.

Version 4.2 has been modified to run on the Hitachi Peach.

Version 5.0 has been modified to run on the TRS-80 Model 4.

Instructions for the Model 4 version are the same as those for the Hitachi Peach, the program has however been further modified to make use of the Model 4 features: the description field has been expanded to 31 characters and the program has been broken up into modules to gain maximum use of the memory. Model 4 owners should type in each module from the magazine and save it to disk as an ASCII file using the filename that is listed in the module, ie:
SAVE "MODULE0/BAS",A

When the program is run, MODULE0 must be the first program that is loaded and run, this module initializes the sytem. The program will load the other modules as required.

Model 4 users should ignore any references in the main text to cassette I/O, these functions are not supported by your machine. Model 4 owners MUST be in the Model 4 mode to run this program.

BOLD PRINTING ON LINE PRINTER VII

This 1 line subroutine which enables owners of a Lineprinter VII to use bold type. The subroutine may also work on other Printers, but I have not tried them.

To use the subroutine, simply LPRINT your normal text, and when you want to use bold type, put the tex in P$ and use GOSUB 1000 (or wherever you put the subroutine). The text must not go over on to the next line, or an error will result. On returning from the subroutine, the Printer's carriage will be placed just after the last character of P$. The routine will work in normal and double size Print mode, but if both are mixed on one line, problems will result.

The subroutine works by simply printing P$ in the same place three times. The control code 26 executes a carriage return with no line feed. ZS$ is a string of blanks, which will return the carriage to the start of P$ after each carriage return. ZP is used to check that P$ will fit on one line and to calculate the length of ZS$. If you want the bold type darker, increase the length of the FOR . . . NEXT loop.

SIRIUS ADVENTURE for the Colour Computer and Hitachi Peach

This Adventure was originally written to run on the Model 1.

It has mainly been converted to take advantage of the HI-RES WRITER published elsewhere in this issue. If you are typing this program in from the magazine, follow the instructions for merging the HI-RES WRITER with this program and then save it. If you have a cassette subscription you only to load the program and the HI-RES WRITER will load into memory as well.

The adventure is fairly small by normal standards, though it will still provide you with a challenge. The Hitachi Peach version is essentially the same program, but without the need for the HI-RES WRITER. As is usual with Adventures, no further clues to its operation will be given here, you'll just have to sweat it out!!!

SPACE UTILITY DISC BASIC by D. Bereis

This utility will go through a Basic program and insert spaces around all of the keywords, this not only makes the listing easier to read on a Model 1, but if you have purchased a Model 4 and still have your Model 1 it will be essential if you want to convert your old Model 1 programs, since the Model 4 WILL NOT run a program that does not have spaces between the keywords. Using this utility will save you hours of typing. To use it simply load your Basic program then type:
  CMD"S"
Then type:
  SPACE and press ENTER/NEWLINE
Then type:
  BASIC * and press ENTER/NEWLINE

Then save the program. If you have a Model 4, all you have to do now is put the disk in your Model 4 and run the conversion program on it. Remember you will still have to check for things like PEEK's and POKE's before you run it.

YAHTZEE L2/16K by T. Domigan

YAHTZEE is based on the popular poker-like 5-dice game of the same name.

AIM

The aim of the game is to score in each of 13 categories and the winner is the player with the highest total score.

ROLLING THE DICE

Each player is allowed 3 rolls of the dice to maximise the score in each of the 13 turns. The first roll changes all 5 dice whilst the remaining 2 players allow selective rolling of any of the 5 dice, e.g. if Rolls 1 gives 4, 3, 6, 1, 4, to maximise the score by rolling more 4's, then "R234" would be suitable. If a good score results after the first or second roll then you may immediately score by entering "S" instead of "R". When scoring it is only necessary to enter the category number e.g. 13.

SCORING

Categories 1-6: Sum of that category dice in hand.
Category 7: 3 of a kind. Score total of dice.
8: 4 . . . .
9: Full house. . . 25 pts
10: Small Straight (sequence of 4 dice) 30 pts
11: Large Straight (sequence of 5 dice) 40 pts
12: YAHTZEE (5 of a kind)score 50 pts
13: CHANCE = anything score sum of dice

If a second or later YAHTZEE (5 of a kind) is scored and the appropriate category 1-6 has been filled, it may be used in categories 7-11.

Sound is available but memory need not be protected as the m/l will reside in the REM statement of line 10.

NOTE: Although written for a Model 3, this program will run on a Model 1 without modification.

SPACE INVADERS for the TRS-80 MC-10

This short Space Invaders game is included in case any of you have bought an MC-10 for Christmas, the program is short and simple, (out of necessity due to the limited memory). To move your laser cannon left and right press the "A" or the "S" keys respectively, these keys were chosen because they have the left and right arrow symbols on them as well. Press the Space Bar to fire. Ten points are given for each Invader that is destroyed. If you shoot all the Invaders before they land you get a bonus of 30 points. If any Invaders land, you lose.

```
**** VER 4.2  HOUSEHOLD ACCOUNTING ****

            HITACHI PEACH


10 REM      WRITTEN BY
       SUNBURST SOFTWARE SERVICES
                 FOR
             MICRO-80  PTY LTD
20 CLEAR 16100:SCREEN0,,1:VV=350:POKE&H2
3C,16:POKE164,10
30 DIM A$(351),LB(351):F3$="  #######.##
":F4$=" $$##,###.##-":F5$="      "+F3$+"
-"
40 W=1:SO$="PRESS ANY KEY TO CONTINUE *"
:Z0$="TOTAL":Z1$="MEMORY":Z2$="ACCOUNT":
Z3$="SELECT FUNCTION *":Z4$="JOURNAL":Z5
$="CREDIT":Z6$="DEBIT":Z7$="DATE"
50 GOSUB230:LOCATE10,10:PRINT"MAXIMUM NU
MBER OF RECORDS = ";VV:LOCATE10,13:PRINT
SO$;:PA=868:LN=1:GOSUB60:GOTO250
60 AD$="":WX=INT(PA/64):WY=PA-(WX*64)
70 FORT=1TOLN
80 GOSUB150:IFIN$=CHR$(13)THEN130ELSEIFI
N$=CHR$(8)THEN110ELSEIFIN$=CHR$(32)THENG
OSUB170
90 AD$=AD$+IN$:LOCATE WY,WX:PRINTAD$;:NE
XT:RETURN
100 NEXT:RETURN
110 IFT<=1THEN80ELSET=T-1
120 AD$=LEFT$(AD$,LEN(AD$)-1):LOCATE WY,
WX:PRINTAD$;"**";:GOTO80
130 IF FL=0 THENBL$=STRING$(LN-LEN(AD$),
" "):AD$=AD$+BL$:LOCATE WY,WX :PRINTAD$;
:RETURN
140 BL$=STRING$(LN-LEN(AD$),"0"):AD$=AD$
+BL$:LOCATE WY,WX :PRINTAD$;:RETURN
150 IN$="":IN$=INKEY$:GOSUB160:IFIN$=""T
HEN150ELSERETURN
160 LOCATE WY,WX :PRINTAD$;CHR$(134);:RE
TURN
170 IFFL=0THENRETURN
180 IN$="0":RETURN
190 T=1
200 IFT>5THENAD$="     0":RETURN
210 IFMID$(AD$,T,1)="0"THENT=T+1:GOTO200
220 AD$=STRING$(T-1,32)+RIGHT$(AD$,6-T):
RETURN
230 CLS:LOCATE0,0:PRINT"* * *   H O U S
E H O L D   A C C O U N T I N G   VER 4.2
   * * *";:LOCATE0,1:PRINT"* * *   (C)
07/07/83    M I C R O - 8 0   P T Y   L
T D   * * *";
240 LOCATE1,3:RETURN
```

```
250 P=0:GOSUB230:LOCATE28,3:PRINT"MENU"
255 LOCATE1,6:PRINT"1 = KEYBOARD INPUT
       : 5 = SAVE DATA":LOCATE1,7:PRIN
T"2 = LOAD DATA                : 6 = PRI
NT JOURNALS"
260 LOCATE1,8:PRINT"3 = READ MEMORY
       : 7 = LINE PRINTER UTILITY":LOC
ATE1,9:PRINT"4 = EDIT MEMORY
  : 8 = PRINT LEDGER ";Z2$;"S"
270 LOCATE0,13:PRINTZ3$;:PA=848:LN=1:GOS
UB60
280 AD=VAL(AD$):IFAD<1 OR AD>8 THEN270
290 ON AD GOTO480,1450,500,600,1350,740,
1150,1180
300 LOCATE18,3:PRINT"KEYBOARD INPUT"
310 LOCATE0,5:PRINTZ7$;"     **/**/**";:L
OCATE0,6:PRINT"REF NO. ****";:LOCATE0,7:
PRINT"DETAILS ***************";:LOCATE0,
8:PRINT"PREFIX  **";:LOCATE0,9:PRINT"ACC
 NO. ***";:LOCATE0,10:PRINTZ6$;"  *****.
**";
320 LOCATE0,4:PRINT"RECORD NO. ";I;
330 LOCATE0,11:PRINTZ5$;" *****.**";:LOC
ATE0,13:PRINT"CORRECT (Y/N) *";:RETURN
340 GOSUB230:GOSUB300
350 FL=1:PA=328:LN=2:GOSUB60:DT$=AD$:IFD
T$="00"THENRETURN
360 GOSUB370:GOSUB380:GOSUB390:GOSUB400:
GOSUB410:FL=1:GOSUB420:GOSUB430:GOSUB440
:GOSUB450:FL=0:GOTO460
370 PA=331:GOSUB60:DT$=DT$+AD$:PA=334:GO
SUB60:DT$=DT$+AD$:RETURN
380 PA=392:LN=4:FL=0:GOSUB60:RF$=AD$:RET
URN
390 PA=456:LN=15:GOSUB60:DE$=AD$:RETURN
400 PA=520:LN=2:GOSUB60:PR$=AD$:RETURN
410 PA=584:LN=3:GOSUB60:PR$=PR$+AD$:RETU
RN
420 PA=647:LN=5:GOSUB60:GOSUB190:DB$=AD$
+".":RETURN
430 PA=653:LN=2:GOSUB60:DB$=DB$+AD$:RETU
RN
440 PA=711:LN=5:GOSUB60:GOSUB190:CR$=AD$
+".":RETURN
450 PA=717:LN=2:GOSUB60:CR$=CR$+AD$:FL=0
:RETURN
460 PA=846:LN=1:GOSUB60:IFAD$="N"THEN340
ELSEIFAD$<>"Y"THEN460
470 A$(I)=DT$+RF$+DE$+PR$+DB$+CR$:RETURN
480 FORI=WTO VV:GOSUB340:IFDT$="00"THENW
=I:GOTO250
490 NEXTI:GOTO250
500 GOSUB230:GOSUB510:GOSUB550:GOTO250
510 LOCATE25,3:PRINT"CONTENTS OF ";Z1$;
520 LOCATE0,4:PRINTZ7$;"      REF    DETAI
LS          ACC NO     ";Z6$;"     ";Z5$
530 IF P THEN PRINT#3,Z7$;"      REF    DE
TAILS          ACC NO     ";Z6$;"     ";
Z5$
540 RETURN
```

```
550 L=1:FORI=1TOW-1
560 GOSUB1570:GOSUB1620:PRINTVX$
570 L=L+1:IFL=11THENL=1:LOCATE0,15:PRINT
SO$;:PA=986:LN=1:GOSUB60:GOSUB230:GOSUB5
10
580 NEXTI
590 LOCATE0,15:PRINT"END OF DATA - ";SO$
;:PA=1000:LN=1:GOSUB60:RETURN
600 I=1:FL=0
610 LOCATE28,3:PRINT"EDIT ";Z1$;
620 GOSUB230:GOSUB310:LOCATE0,13:PRINT"
            ";:LOCATE0,15:PRINT"SELECT
 *";
630 LOCATE0,4:PRINT"RECORD NO. ";I;
640 GOSUB1570
650 IFV1$=""THENGOSUB310:LOCATE0,13:PRIN
T"            ";
660 LOCATE8,5:PRINTV1$;:LOCATE11,5:PRINT
V2$;:LOCATE14,5:PRINTV3$;:LOCATE8,6:PRIN
TV4$;:LOCATE8,7:PRINTV5$;:LOCATE8,8:PRIN
TV6$;:LOCATE8,9:PRINTV7$;:LOCATE7,10:PRI
NTV8$;:LOCATE7,11:PRINTV9$;
670 PA=967:LN=1:GOSUB60:IFAD$=";"THENLOC
ATE0,15:PRINT"ADVANCE";:I=I+1:IF I>VV TH
EN I=VV
680 IF AD$="+"THENLOCATE0,15:PRINT"ADVAN
CE";:I=I+10:IF I>VV THEN I=VV
690 IF AD$="-"THEN I=I-1:LOCATE0,15:PRIN
T"REVERSE";:IF I<=0 THEN I=1
700 IF AD$="="THEN I=I-10:LOCATE0,15:PRI
NT"REVERSE";:IF I<=0 THEN I=1
710 IFAD$="  "THEN250
720 IF AD$="E"THENLOCATE0,15:PRINT"* EDI
T *";:GOSUB840:GOTO620
730 GOTO630
740 GOSUB230:LOCATE18,3:PRINTZ4$;"S AVAI
LABLE"
745 LOCATE0,5:PRINT"1 = PRINT LEDGER BAL
ANCES        :  4 = GJ GENERAL ";Z4$;:LOC
ATE0,6:PRINT"2 = CP CASH PAYMENTS ";Z4$;
"     :  5 = SJ SALES ";Z4$;:LOCATE0,7:PR
INT"3 = CR CASH RECEIVED ";Z4$;"     :  6
 = RETURN TO MAIN MENU"
750 LOCATE0,13:PRINTZ3$;:PA=848:LN=1:GOS
UB60:AD=VAL(AD$)
760 IFAD<1 OR AD>6 THEN750
770 ON AD GOTO 1630,780,790,800,810,250
780 PT$="CASH PAYMENTS":KA$="CP":GOTO820
790 PT$="CASH RECEIVED":KA$="CR":GOTO820
800 PT$="GENERAL":KA$="GJ":GOTO820
810 PT$="SALES":KA$="SJ"
820 GOSUB980:GOSUB1010:GOTO1030
830 PRINTSO$:PA=1022:LN=1:GOSUB60:GOTO25
0
840 FL=1:PA=328:LN=2:GOSUB60:IFAD$="00"T
HENDT$=V1$+V2$+V3$:LOCATE8,5:PRINTV1$;"/
";V2$;"/";V3$;:GOTO860
850 DT$=AD$:GOSUB370
860 GOSUB380:IFRF$="    "THENRF$=V4$:LOC
ATE8,6:PRINTRF$;
```

```
87Ø GOSUB39Ø:IFDE$="              "THEN
DE$=V5$:LOCATE8,7:PRINTDE$;
88Ø GOSUB4ØØ:IFPR$="  "THENP1$=V6$:LOCAT
E8,8:PRINTV6$;:GOTO9ØØ
89Ø P1$=AD$
9ØØ GOSUB41Ø:IFAD$="   "THENPR$=P1$+V7$:
LOCATE8,9:PRINTV7$;:GOTO92Ø
91Ø PR$=P1$+AD$
92Ø FL=Ø:GOSUB42Ø:IFAD$="      "THENDB$=V
8$:LOCATE7,1Ø:PRINTV8$;:GOTO94Ø
93Ø GOSUB19Ø:GOSUB43Ø
94Ø FL=Ø:GOSUB44Ø:IFAD$="      "THENCR$=V
9$:LOCATE7,11:PRINTV9$;:GOTO96Ø
95Ø GOSUB19Ø:GOSUB45Ø
96Ø GOSUB47Ø
97Ø FL=Ø:RETURN
98Ø LOCATEØ,13:PRINT"IS THE PRINTER REQU
IRED (Y/N) *";:PA=862:LN=1:GOSUB6Ø
99Ø IF AD$<>"N" AND AD$<>"Y"THEN98Ø
1ØØØ P=(AD$="Y"):IF P THEN OPEN"O",#3,"L
PTØ:"
1ØØ5 RETURN
1Ø1Ø ZK$="":LOCATEØ,14:PRINT"WHICH ";Z7$
;" DO YOU REQUIRE **/**/**";:FL=1:PA=922
:LN=2:GOSUB6Ø:E$=AD$:IFE$="ØØ"THENE$="'S
":ZK$="ALL ":GOTO1Ø3Ø
1Ø2Ø PA=925:GOSUB6Ø:E$=E$+AD$:PA=928:GOS
UB6Ø:E$=E$+AD$:RETURN
1Ø3Ø GOSUB23Ø:LOCATEØ,3:PRINTPT$;" ";Z4$
;" FOR ";ZK$;"(";Z7$;")";E$:IF P THEN PR
INT#3," ":PRINT#3,PT$;" ";Z4$;" FOR ";ZK
$;"(";Z7$;")";E$
1Ø4Ø DT#=Ø:CT#=Ø:BL#=Ø:GOSUB52Ø
1Ø5Ø FORI=1TOW
1Ø6Ø IFMID$(A$(I),26,2)<>KA$THEN111Ø
1Ø7Ø IFE$="'S"THEN1Ø9Ø
1Ø8Ø IFE$<>LEFT$(A$(I),6)THEN111Ø
1Ø9Ø GOSUB157Ø:GOSUB162Ø:PRINTVX$:IF P T
HEN PRINT#3,VX$
11ØØ DR#=VAL(MID$(A$(I),31,8)):CR#=VAL(M
ID$(A$(I),39,8)):DT#=DT#+DR#:CT#=CT#+CR#
:BL#=BL#+DR#-CR#
111Ø NEXT
112Ø PRINT:PRINTZØ$;TAB(36);:PRINTUSINGF
3$;DT#;CT#:PRINT"BALANCE ";:PRINTUSINGF4
$;BL#
113Ø IF P THEN PRINT#3," " :PRINT#3,ZØ$;
TAB(36);:PRINT#3,USINGF3$;DT#;CT#:PRINT#
3,"BALANCE ";:PRINT#3,USINGF4$;BL#:CLOSE
#3
114Ø LOCATEØ,15:PRINT"PRINTOUT COMPLETE
- ";SO$;:PA=1ØØ6:LN=1:GOSUB6Ø:GOTO74Ø
115Ø GOSUB23Ø:AD$="Y":GOSUB1ØØØ:LOCATE8,
3:PRINT"LINEPRINTER UTILITY":LOCATEØ,5:P
RINT"TYPE HEADINGS OR NOTES AS REQUIRED"
:LOCATEØ,6:PRINT"TYPE ";CHR$(34);"EXIT";
CHR$(34);" TO RETURN TO MAIN MENU"
116Ø M$="":INPUTM$:IFM$="EXIT"THEN CLOSE
#3:GOTO25Ø
117Ø PRINTM$:PRINT#3,M$:GOTO116Ø
118Ø GOSUB23Ø:LOCATE18,2:PRINT"LEDGER ";
Z2$;"S":LOCATEØ,5:PRINT"TYPE ";CHR$(34);
"999";CHR$(34);" TO EXIT"
119Ø GOSUB98Ø
12ØØ LOCATEØ,15:PRINT"WHICH ";Z2$;" NO.
DO YOU REQUIRE ***";:PA=993:LN=3:FL=1:GO
SUB6Ø:N=VAL(AD$)
121Ø IFN<1ORN>999THEN12ØØ
122Ø BL#=Ø:DT#=Ø:CT#=Ø:IFN=999THENCLOSE#
3:GOTO25Ø
123Ø GOSUB24Ø:LOCATEØ,3:PRINTZ2$;" NO. "
;AD$;:IF P THEN PRINT#3," ":PRINT#3,Z2$;
" NO. ";AD$
124Ø LOCATEØ,6:GOSUB52Ø:FORI=1TOW
125Ø IFN<>VAL(MID$(A$(I),28,3))THEN128Ø
126Ø GOSUB157Ø:GOSUB162Ø:PRINTVX$:IF P T
HEN PRINT#3,VX$
127Ø DR#=VAL(MID$(A$(I),31,8)):CR#=VAL(M
ID$(A$(I),39,8)):DT#=DT#+DR#:CT#=CT#+CR#
:BL#=BL#+DR#-CR#
128Ø NEXT
129Ø PRINT:PRINTZØ$;TAB(36);:PRINTUSINGF
3$;DT#;CT#
13ØØ IF P THEN PRINT#3," ":PRINT#3,ZØ$;T
AB(36);:PRINT#3,USINGF3$;DT#;CT#
131Ø PRINTZ2$;" BALANCE";:PRINTUSINGF4$;
BL#
132Ø IF P THEN PRINT#3,Z2$;" BALANCE";:P
RINT#3,USINGF4$;BL#
133Ø PRINT:PRINT:IF P THEN PRINT#3," ":P
RINT#3," "
134Ø GOTO12ØØ
135Ø X1$="SAVE TO":GOSUB158Ø
136Ø GOSUB159Ø
137Ø IF SF=3THEN25Ø
138Ø GOSUB16ØØ
139Ø GOSUB161Ø:IF AD$="E" THEN GOTO135Ø
14ØØ IF SF=1 THEN N1$=RIGHT$(NM$,8):OPEN
"O",#2,"CASØ:DATA":PRINT#2,N1$,W
141Ø IF SF=2 THEN OPEN"O",1,NM$
142Ø IF SF=1 THEN FOR I=1 TO W STEP4:PRI
NT#2,A$(I),A$(I+1),A$(I+2),A$(I+3):NEXT:
CLOSE#2
143Ø IF SF=2 THEN PRINT#1,W:FOR I=1 TO W
:PRINT#1,A$(I):NEXT:CLOSE
144Ø GOTO135Ø
145Ø X1$="LOAD FROM":GOSUB158Ø
146Ø GOSUB159Ø
147Ø IF SF=3THEN25Ø
148Ø GOSUB16ØØ
149Ø GOSUB161Ø:IF AD$="E" THEN GOTO145Ø
15ØØ IF SF=1 THEN N2$=RIGHT$(NM$,8):OPEN
"I",#2,"CASØ:DATA":INPUT#2,N1$,W:IFN1$<>
N2$THENGOTO155Ø
151Ø IFSF=2THENOPEN"I",1,NM$
152Ø IF SF=1 THEN FOR I=1 TO W STEP4:INP
UT#2,A$(I),A$(I+1),A$(I+2),A$(I+3):NEXTI
:CLOSE#2
153Ø IF SF=2 THEN INPUT#1,W:FOR I=1 TO W
:INPUT#1,A$(I):NEXT:CLOSE
154Ø GOTO145Ø
155Ø LOCATEØ,13:PRINT"THIS IS FILE ";N1$
;" NOT FILE ";N2$;:CLOSE#2
156Ø LOCATEØ,14:PRINT"PRESS ANY KEY TO A
BORT *";:PA=919:LN=1:GOSUB6Ø:GOTO145Ø
157Ø V1$=LEFT$(A$(I),2):V2$=MID$(A$(I),3
,2):V3$=MID$(A$(I),5,2):V4$=MID$(A$(I),7
,4):V5$=MID$(A$(I),11,15):V6$=MID$(A$(I)
,26,2):V7$=MID$(A$(I),28,3):V8$=MID$(A$(
I),31,8):V9$=MID$(A$(I),39,8):RETURN
158Ø GOSUB23Ø:LOCATE23,3:PRINT"DATA ";LE
FT$(X1$,4):LOCATEØ,5:PRINT"1 = ";X1$;" T
APE":LOCATEØ,7:PRINT"2 = ";X1$;" DISK":L
OCATEØ,9:PRINT"3 = EXIT TO MENU":RETURN
159Ø LOCATEØ,13:PRINTZ3$;:PA=848:LN=1:GO
SUB6Ø:SF=VAL(AD$):IF SF<1 OR SF>3THEN159
ØELSERETURN
16ØØ FL=Ø:GOSUB23Ø:LOCATEØ,7:PRINT"ENTER
 FILENAME ********";:PA=463:LN=8:GOSUB6Ø
:NM$="1:"+AD$:RETURN
161Ø LOCATEØ,8:PRINT"PRESS ANY KEY WHEN
DEVICE READY OR  (E)SCAPE  *";:PA=558:LN
=1:GOSUB6Ø:RETURN
162Ø VX$=V1$+"/"+V2$+"/"+V3$+" "+V4$+"
"+V5$+"  "+V6$+V7$+"    "+V8$+"    "+V9$:
RETURN
163Ø GOSUB23Ø:GOSUB98Ø:GOSUB23Ø:GOSUB178
Ø:LOCATE15,7:PRINT"* * *  W A I T  * * *
":FOR I=1 TO W-1:GOSUB157Ø:LB(I)=VAL(RIG
HT$(V7$,3)):NEXTI:J=Ø:DT#=Ø:CT#=Ø:BL#=Ø
164Ø GOSUB23Ø:PRINT:PRINT"ACC NO.";TAB(1
6);Z6$;"S";TAB(34);Z5$;"S";TAB(55);ZØ$
165Ø IF P THEN PRINT#3," ":PRINT#3,"ACC
NO.";TAB(16);Z6$;"S";TAB(34);Z5$;"S";TAB
(55);ZØ$
166Ø TT#=Ø:DR#=Ø:CR#=Ø:J=J+1
167Ø VF=LB(J):FORI=1TOW:IFLB(I)=VF AND L
B(I)<>ØTHENGOSUB177Ø
168Ø NEXTI:LB(J)=Ø:IFJ=WTHEN174ØELSE169Ø
169Ø IFVF=ØTHEN166Ø
17ØØ TT#=DR#-CR#:DT#=DT#+DR#:CT#=CT#+CR#
:BL#=BL#+TT#
171Ø PRINT"  ";MID$(A$(J),28,3);:PRINTUS
INGF5$;DR#;CR#;TT#
172Ø IF P THEN PRINT#3,"  ";MID$(A$(J),2
8,3);:PRINT#3,USINGF5$;DR#;CR#;TT#
173Ø GOTO166Ø
174Ø PRINT:PRINTZØ$;:PRINTUSINGF5$;DT#;C
T#;BL#
175Ø IF P THEN PRINT#3,:PRINT#3,ZØ$;:PRI
NT#3,USINGF5$;DT#;CT#;BL#:CLOSE#3
176Ø LOCATEØ,15:PRINTSO$;:PA=986:LN=1:GO
SUB6Ø:GOTO25Ø
177Ø GOSUB157Ø:DR#=DR#+VAL(V8$):CR#=CR#+
VAL(V9$):LB(I)=Ø:RETURN
178Ø LOCATE15,7:PRINT"* * *  SORTING  *
* *":FOR SC=1 TO W-1:FOR SA=1 TO W-1
179Ø SA$=MID$(A$(SA),28,3)
18ØØ SB$=MID$(A$(SA+1),28,3):IF SB$=""TH
ENGOTO181ØELSE IF SA$>SB$ THEN SB$=A$(SA
):A$(SA)=A$(SA+1):A$(SA+1)=SB$
181Ø NEXTSA:NEXTSC:RETURN
```

```
           **** SIRIUS ADVENTURE ****

                 HITACHI PEACH

10 REM    SIRIUS ADVENTURE
20 REM (C) MAY 1983 MLADEN BAUK.
30 REM
40 REM MODIFIED FOR THE HITACHI PEACH
       BY -- MICRO-8Ø
6Ø CLS:SCREENØ,,Ø
7Ø LOCATE7,4:PRINT"  S I R I U S ":LOCAT
E7,5:PRINT"   ADVENTURE":FOR X=1TO2ØØØ:N
EXT:CLS
8Ø CLEAR 2ØØ: VB=22: ND=26: L=21: OB=6:
LN=337
9Ø CLS: LOCATE15,3:PRINT"Sirius Adventur
e": PM$=">": PF$=" "
1ØØ LOCATE9,5:PRINT"Press:  <I> nstructi
ons  or"
11Ø LOCATE17,6:PRINT"<B> egin.": CL$="
     "
12Ø DIM A$(VB), B$(ND), L$(L), B(OB): GO
SUB 143Ø
13Ø A$= INKEY$: IF A$="" THEN 13Ø
14Ø IF A$="I" THEN 172Ø
15Ø IF A$< >"B" THEN 13Ø
16Ø CLS
17Ø IF LO=OL THEN 27Ø
18Ø OL=LO:CLS: LOCATE15,3:PRINT"Sirius A
dventure"
19Ø IF LO>4 AND B(1)< > -1 THEN PRINT: P
RINT"      It's too dark to see!": GOTO 2
7Ø
2ØØ PRINT"I am ...":PRINTL$(LO)
21Ø LINE(Ø,1ØØ)-(656,1ØØ),PSET
22Ø TR=Ø: LOCATE7,2Ø:PRINTCL$;: LOCATE7,
2Ø:PRINT"Visible objects >>> ";
23Ø FOR I=1 TO OB
24Ø IF B(I)=LO THEN PRINTB$(I);".   ";: T
R= -1
25Ø NEXT I
26Ø IF TR< > -1 THEN LOCATE27,2Ø:PRINT"N
one.";
27Ø LOCATEØ,15:PRINT"What should I do?";
CL$;: C$="":GOSUB 19ØØ: PRINT: PRINT
28Ø IF C$="" THEN PRINT"Huh?": GOTO 27Ø
29Ø FOR I=1 TO LEN(C$): IF ASC( MID$( C$
, I, 1))=32 THEN 31Ø
3ØØ NEXT I: GOTO 32Ø
31Ø LE$= LEFT$( C$, I-1): RI$= MID$( C$,
 I+1, LEN(C$)- LEN(LE$)-1):GOTO 33Ø
32Ø LE$= LEFT$(C$, I): RI$=""
33Ø L= LEN(LE$): IF RI$="" THEN R= -1 EL
SE R= LEN(RI$)
34Ø FOR I=1 TO VB: IF L> LEN(A$(I)) THEN
 36Ø
35Ø IF LE$< > LEFT$(A$(I),L) THEN 36Ø EL
SE 38Ø
36Ø NEXT I
37Ø IF C$< >"" THEN PRINT"I don't unders
tand "CHR$(34);C$;CHR$(34)", check my vo
cabulary.": GOTO 27Ø
38Ø IF R= -1 THEN 42Ø
39Ø FOR J=1 TO ND
4ØØ IF RI$< >B$(J) THEN NEXT J ELSE 42Ø
41Ø PRINT"I don't understand "CHR$(34);R
I$;CHR$(34)", check my vocabulary.": GOT
O 27Ø
42Ø ON I GOSUB 45Ø,45Ø,45Ø,45Ø,83Ø,88Ø,8
8Ø,88Ø,95Ø,95Ø,95Ø,95Ø,98Ø,1Ø5Ø,98Ø,123Ø
,98Ø,112Ø,116Ø,129Ø,136Ø,2Ø1Ø
43Ø IF I>4 AND I<13 THEN 21Ø
44Ø IF I=22 THEN 18Ø ELSE 17Ø
45Ø IF J<OB+1 THEN PRINT"I can't "CHR$(3
4);A$(I)+" ";RI$;CHR$(34)"!": GOTO 27Ø
46Ø J=J-OB: ON J GOTO 55Ø,64Ø,71Ø,75Ø,55
Ø,64Ø,71Ø,75Ø,47Ø,49Ø,51Ø,53Ø,47Ø,49Ø,51
Ø,53Ø,79Ø,81Ø,79Ø,81Ø
47Ø IF LO=13 THEN LO=11 ELSE GOSUB 186Ø
48Ø RETURN
49Ø IF LO=12 THEN LO=11 ELSE IF LO=14 TH
EN LO=15 ELSE GOSUB 186Ø
5ØØ RETURN
51Ø IF LO=11 THEN LO=12 ELSE IF LO=15 TH
EN LO=14 ELSE GOSUB 186Ø
52Ø RETURN
53Ø IF LO=11 THEN LO=13 ELSE GOSUB 186Ø
54Ø RETURN
55Ø IF LO=2 THEN LO=1 ELSE IF LO=5 THEN
LO=4 ELSE IF LO=6 THEN LO=5
56Ø IF LO=7 THEN LO=9 ELSE IF LO=11 THEN
 LO=7
57Ø IF LO=16 AND B(4)= -1 THEN GOSUB 187
Ø
58Ø IF LO=16 AND B(4)< > -1 THEN LO=17
59Ø IF LO=18 AND B(5)= -1 THEN LO=19
6ØØ IF LO=18 AND B(5)< > -1 THEN GOSUB 1
87Ø
61Ø IF LO=15 THEN LO=16
62Ø IF LO=OL THEN GOSUB 186Ø
63Ø RETURN
64Ø IF LO=1 THEN LO=2 ELSE IF LO=4 THEN
LO=5 ELSE IF LO=5 THEN LO=6
65Ø IF LO=9 THEN LO=7 ELSE IF LO=7 THEN
LO=11 ELSE IF LO=16 THEN LO=15
66Ø IF LO=17 THEN LO=16
67Ø IF LO=19 AND B(5)= -1 THEN LO=18
68Ø IF LO=19 AND B(5)< > -1 THEN GOSUB 1
87Ø
69Ø IF LO=OL THEN GOSUB 186Ø
7ØØ RETURN
71Ø IF LO=3 THEN LO=2 ELSE IF LO=4 THEN
LO=3 ELSE IF LO=1Ø THEN LO=7
72Ø IF LO=7 THEN LO=8 ELSE IF LO=19 THEN
 LO=2Ø ELSE IF LO=2Ø THEN LO=21
73Ø IF LO=OL THEN GOSUB 186Ø
74Ø RETURN
75Ø IF LO=2 THEN LO=3 ELSE IF LO=3 THEN
LO=4 ELSE IF LO=7 THEN LO=1Ø
76Ø IF LO=8 THEN LO=7 ELSE IF LO=2Ø THEN
 LO=19 ELSE IF LO=21 THEN LO=2Ø
77Ø IF LO=OL THEN GOSUB 186Ø
78Ø RETURN
79Ø IF LO=7 THEN LO=6 ELSE IF LO=18 THEN
 LO=17 ELSE GOSUB 186Ø
8ØØ RETURN
81Ø IF LO=6 THEN LO=7 ELSE IF LO=17 THEN
 LO=18 ELSE GOSUB 186Ø
82Ø RETURN
83Ø IF J=Ø THEN J=3
84Ø IF J< >2 THEN PRINT"I can't eat that
, stupid.": RETURN
85Ø IF J=2 AND B(J)=Ø THEN PRINT"I alrea
dy ate it.":RETURN
86Ø IF J=2 THEN PRINT"Munch, chomp, <BUR
P> - the creambun was delicious!": B(2)=
Ø: RETURN
87Ø PRINT"ERROR": STOP
88Ø IF J>OB THEN PRINT"I can't "CHR$(34)
;C$;CHR$(34)".": RETURN
89Ø IF B(J)= -1 THEN PRINT"I already hav
e it!": RETURN
9ØØ IF B(J)< >LO THEN PRINT"I can't see
the ";B$(J);" here.":RETURN
91Ø IT=1: FOR I9=1 TO OB: IF B(I9)= -1 T
HEN IT=IT+1
92Ø NEXT I9:IF IT>3 THEN PRINT"I am carr
ying too much, check inventory.";:RETURN
93Ø PRINT"Ok. I add a "B$(J)" to my inve
ntory."
94Ø B(J)= -1: RETURN
95Ø IF J>OB THEN PRINT"I can't "CHR$(34)
;C$;CHR$(34)".": RETURN
96Ø IF B(J)< > -1 THEN PRINT"I don't hav
e a "RI$: RETURN
97Ø B(J)=LO: PRINT"Ok": RETURN
98Ø IF J>OB THEN PRINT"I don't see anyth
ing special.": RETURN
99Ø IF B(J)< > -1 THEN PRINT"I am not ca
rrying a "B$(J): RETURN
1ØØØ ON J GOTO 1Ø1Ø,1Ø2Ø,1Ø3Ø,1Ø3Ø,1Ø3Ø,
1Ø4Ø
1Ø1Ø PRINT"It burns brightly.": RETURN
1Ø2Ø PRINT"It looks tasty!": RETURN
1Ø3Ø PRINT"Magic seems to emanate from t
he "B$(J): RETURN
1Ø4Ø PRINT"Its beautiful!": RETURN
1Ø5Ø IF J>OB THEN PRINT"You are being si
lly.": RETURN
1Ø6Ø IF B(J)< > -1 THEN PRINT"I don't ha
ve the "B$(J)".": RETURN
1Ø7Ø IF J< >3 THEN PRINT"Waving the "B$(
J):PRINT" is not very rewarding.": RETUR
N
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1Ø8Ø PRINT"The room dims and blurs, and.
..";
1Ø9Ø FOR I=1 TO 1ØØØ: NEXT I
11ØØ IF LO=13 THEN LO=14 ELSE IF LO=14 T
HEN LO=13 ELSE PRINT"nothing happens.":
RETURN
111Ø PRINT"I am magically transported!":
 FOR I=1 TO 1ØØØ: NEXT I: RETURN
112Ø PRINT"Confirm  <Y/N> ?";: C$="": LO
CATE7,3:PRINTN,CL$: GOSUB 19ØØ
113Ø IF C$="Y" THEN A=USR1(Ø):CLS: END
114Ø IF C$< >"N" THEN 112Ø
115Ø PRINT:PRINT:PRINT"Confirm  <CANCELL
ED>": RETURN
116Ø IN=Ø: FOR I9=4 TO 6
117Ø IF B(I9)=1 THEN IN=IN+2Ø
118Ø NEXT I9
119Ø IF IN=6Ø THEN PRINT"Fantastic!
     you have solved the adventure!"
12ØØ PRINT"You have"IN"points out of a p
ossible 6Ø."
121Ø IF IN=6Ø THEN A=USR1(Ø):CLS: END
122Ø RETURN
123Ø PRINT"I am carrying >>> ";
124Ø IN=Ø: FOR I9=1 TO OB
125Ø IF B(I9)= -1 THEN PRINT"A "B$(I9);"
.  ";: IN= -1
126Ø NEXT I9
127Ø IF IN< > -1 THEN PRINT"Nothing at a
ll.": RETURN
128Ø RETURN
129Ø PRINT"Ready tape...press <ENTER>"
13ØØ IN$= INKEY$:IFIN$=""THEN13ØØ
131Ø OPEN "O",#1,"CASØ:URLORD"
132Ø FOR I9=1 TO OB: PRINT#1,B(I9);: NEX
T I9
133Ø PRINT#1,LO
134Ø CLOSE #1
135Ø RETURN
136Ø PRINT"Ready tape...press <ENTER>"
137Ø IN$= INKEY$:IFIN$=""THEN137Ø
138Ø OPEN "I",#1,"CASØ:URLORD"
139Ø FOR I9=1 TO OB: INPUT#1,B(I9): NEXT
 I9
14ØØ INPUT#1,LO
141Ø CLOSE #1
142Ø RETURN
143Ø LO=1
144Ø FOR I=1 TO VB: READ A$(I): NEXT I
145Ø FOR I=1 TO ND: READ B$(I): NEXT I
146Ø DATA GO,WALK,RUN,CRAWL,EAT,GET,TAKE
,GRAB,DROP,THROW,PUT,LEAVE,LOOK,WAVE,EXA
MINE,INVENTORY,INSPECT,QUIT,SCORE,SAVE,L
OAD,VOCABULARY
147Ø DATA LAMP,BUN,ROD,RING,STATUE,CROWN
,N,S,W,E,NORTH,SOUTH,WEST,EAST,NW,NE,SW,
SE,NORTHWEST,NORTHEAST,SOUTHWEST,SOUTHEA
ST,UP,DOWN,U,D
148Ø DATA 1,6,9,8,12,21
149Ø FOR I=1 TO OB: READ B(I): NEXT I
15ØØ FOR I=1 TO L: READ L$(I): NEXT I: R
ETURN
151Ø DATA "at a plateau near a cliff. A
rocky path leads south. Some  obvious ex
its: South."
152Ø DATA "on a rocky path leading north
 and       curving to the east. Some obv
ious       exits: North. East."
153Ø DATA "at the entrance to a dark cav
e. A rocky path to the west curves north
. There is a slight breeze.Some obvious
exits:     West. East."
154Ø DATA "just inside a dark cave. Ligh
t comes     from an entrance to the west.
 There is adank,mouldy smell. A tunnel l
eads south.Some obvious exits: West. Sou
th."
155Ø DATA "in a low north/south tunnel.
Some       obvious exits: North. South"
156Ø DATA "in an oval cavern. There is a
 forbiddingstone staircase here. Some ob
vious      exits: North. Down."
157Ø DATA "in a high, square cave with w
alls of    frozen ice. There are passage
s in many  directions. Some obvious exit
s: North.  South. West. East. Up."
158Ø DATA "in a triangular side-chamber.
 Some       obvious exits: East."
159Ø DATA "in a musty-smelling alcove. S
ome obviousexits: South."
16ØØ DATA "in an eerie chamber - small s
quealing   sounds come from the walls. S
ome obviousexits: West."
161Ø DATA "in an enormous cave. There is
 a double  pillar of green stone down th
e centre.  Some obvious exits: North. So
uthwest.   Southeast."
162Ø DATA "in a malodourous tunnel. Some
 obvious   exits: Northeast."
163Ø DATA "in a room in which the only V
ISIBLE exitis the way I came in. Some ob
vious      exits: Northwest"
164Ø DATA "in a secret room,reached only
 by magicalmeans. Some obvious exits: No
rtheast."
165Ø DATA "in a octagonal room. Some obv
ious exits:North. Southwest."
166Ø DATA "in an enormous misty cavern.
Mist       obscures the ceiling. Some ob
vious      exits: North. South."
167Ø DATA "in a tiny box-shaped room. Do
or leads   south and stairs lead down. S
ome obviousexits: South. Down."
168Ø DATA "in a strange room. There's a
faint whiffof chlorine. Some obvious exi
ts: North. Up."
169Ø DATA "in a steamy chamber, with war
m walls.   Some obvious exits: West.Sout
h."
17ØØ DATA "in a large room, littered wit
h alabasterslabs. Some obvious exits: We
st. East."
171Ø DATA "in the throne room of the evi
l  Urlord! A low door leads east. Some o
bvious      exits: East."
172Ø CLS:LOCATE7,3:PRINT"";:PRINT"Your q
uest is to explore the cave of the";
173Ø PRINT"evil Urlord, and bring back t
o the edge of the cliff the following va
luables:"
174Ø PRINT"1. The white gold ring."
175Ø PRINT"2. The sacred silver statue."
176Ø PRINT"3. The jewelled crown of the
Urlord.";
177Ø PRINT:PRINT
178Ø PRINT"Be careful...":PRINT:PRINT:PR
INT
179Ø PRINT"Press  <C> ontinue."
18ØØ FOR I=1 TO 4ØØØ
181Ø A$= INKEY$: IF A$="" THEN 184Ø
182Ø IF A$< >"C" THEN 181Ø
183Ø GOTO 17Ø
184Ø NEXT I
185Ø GOTO 17Ø
186Ø PRINT"You cannot go in that directi
on.": RETURN
187Ø PRINT"An invisible force prevents y
ou from passing."
188Ø FOR I=1 TO 1ØØØ: NEXT I
189Ø RETURN
19ØØ LOCATE18,15:PRINTC$;PM$;"  ";
191Ø A$= INKEY$: IF A$="" THEN 191Ø
192Ø LOCATE18,15:PRINT,PF$;: A=ASC(A$)
193Ø IF A>31 THEN 199Ø
194Ø IF A=8 AND LEN(C$)>Ø THEN C$= LEFT$
(C$,LEN(C$)-1): LOCATE18,15:PRINTCL$;:LO
CATE18,15 :PRINTC$;: GOTO 19ØØ ELSE IF A
=8 THEN 19ØØ
195Ø IF A=13 THEN GOSUB2Ø4Ø:FOR X=15 TO
23:LOCATEØ,X:PRINT"
                         ":NEXT:LOCATEØ,15:RETU
RN
196Ø IF A=1Ø THEN A$= CHR$(92) ELSE IF A
=27 THEN A$="@"
197Ø IF A=9 THEN A$= CHR$(187) ELSE IF A
=31 THEN A$="%"
198Ø IF A=24 THEN C$="": LOCATE18,15:PRI
NTCL$;: GOTO 19ØØ
199Ø C$=C$+A$: IF LEN(C$)>2Ø THEN RETURN
2ØØØ LOCATE18,15:PRINTC$;: GOTO 19ØØ
2Ø1Ø CLS:LOCATE15,3:PRINTA$(22):LOCATE7,
4:PRINT;
2Ø2Ø FOR I9=1 TO VB: PRINT A$(I9),: NEXT
 I9
2Ø3Ø A$= INKEY$:IF A$="" THEN 2Ø3Ø ELSE
RETURN
2Ø4Ø X=(PEEK(39)*256+PEEK(4Ø))-(PEEK(33)
*256+PEEK(34)):RETURN
```

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**** KILLER SATELLITE ****

      COLOUR COMPUTER


1Ø REM THE KILLER SATELLITE
2Ø REM    VERSION  1.1
3Ø REM       15/8/83
4Ø REM ** BY N.S.EDWARDS **
5Ø REM INITIAL DISPLAY
6Ø CLSØ:FOR T=1 TO 15:SET(RND(64
)-1,RND(32)-1,5):NEXT:PRINT@262,
"the"CHR$(128)"killer"CHR$(128)"
satellite";
7Ø PRINT@34Ø,CHR$(249);:PRINT@37
3,CHR$(175);:PRINT@4Ø4,CHR$(246)
;
8Ø REM SET UP STRINGS
9Ø FOR T=1 TO 5:SH$=SH$+CHR$(183
)+CHR$(187)+CHR$(128):NEXT
1ØØ FOR T=1 TO 7:B$=B$+CHR$(143+
16*T):NEXT
11Ø PRINT@365,B$;
12Ø FOR T=1 TO 8:PLAY"O1L2ØCP1Ø"
:NEXT
13Ø CLS:PRINT"A SATELLITE ORBITI
NG FAR ABOVE  THE EARTH HAS MALF
UNCTIONED.    IT HAS BEGUN SENDI
NG DANGEROUS  COSMIC";
135 PRINT" RAYS TOWARDS THE EART
H.    YOU MUST PROTECT THE EARTH
    FROM THE COSMIC RAYS BY MATC
HINGTHE COLOURS OF THE APPROACHI
NG  RAYS";
14Ø PRINT" WITH YOUR SHIELD UNTI
L THE SATELLITE RUNS OUT OF POWE
R (11 ROUNDS).":PRINT:PRINT"TO D
O THIS USE THE <SPACE BAR> .":PR
INT"  BE WARNED THE RAYS TRAVEL
AT  EVER INCREASING SPEEDS."
15Ø PRINT@484,"PRESS <ENTER> TO
BEGIN";
16Ø T=-1
17Ø IF INKEY$="" THEN IF T THENP
LAY"O1L1ØGP8":SCREENØ,1 ELSE PLA
Y"O1L1ØCP8":SCREENØ,Ø ELSE 19Ø
18Ø T=NOT(T):GOTO 17Ø
19Ø REM INITIALIZE VARIABLES
2ØØ CLSØ:X=27Ø:S=11Ø:SH=3:E=1:S1
=Ø:M=Ø:R=Ø
21Ø GOTO5ØØ
22Ø REM CONTROL LOOP
23Ø GOSUB 43Ø
24Ø REM FIND COLOUR MATCH
25Ø F=Ø
26Ø F=INSTR(F+1,Q$,D$):IF F=Ø TH
EN 29Ø
27Ø MID$(A$,F)=MID$(A$,F+1)
28Ø X=X+1:M=M+1Ø:E=E-1
29Ø Q$=MID$(A$,1,E)
3ØØ REM UPDATE DISPLAY
31Ø PRINT@X,Q$;:PRINT@463,M;
32Ø PLAY"L2ØO1C"
33Ø REM CHECK FOR WIN
34Ø IF LEFT$(A$,1)=CHR$(128) THE
N M=M+1ØØ*R:GOTO 5ØØ
35Ø GOSUB 43Ø
36Ø REM CHECK FOR LOSS
37Ø X=X-1:E=E+1:IF X=<259 THEN M
=M-4ØØ:GOSUB58Ø:GOTO5ØØ
38Ø GOSUB 43Ø
39Ø GOTO23Ø
4ØØ REM END CONTROL LOOP
41Ø REM
42Ø REM CHANGE SHIP COLOUR
43Ø FOR V=1 TO G
44Ø IF PEEK(345)=247 THEN C=C+1:
IF C>7 THEN C=1
45Ø D$=CHR$(143+16*C):PRINT@258,
D$;
46Ø FOR I=1 TO SV:NEXT
47Ø NEXT V
48Ø RETURN
49Ø REM NEXT LEVEL
5ØØ R=R+1:S1=S1+1:IF R>11 THEN 7
2Ø ELSE CLSØ:FOR Z=1 TO 1Ø:X1=RN
D(64)-1:Y1=RND(32)-1:SET(X1,Y1,5
):NEXT
51Ø IF S1>=5 THEN S1=2:SH=SH+1:I
F SH>5 THEN SH=5
52Ø PRINT@244,CHR$(249);:PRINT@2
77,CHR$(175);:PRINT@3Ø8,CHR$(246
);
53Ø PRINT@457,"SCORE ";M;:PRINT@
11,"ROUND ";R;:X=275:E=1:S=S-1Ø:
A$="": FOR T=1 TO 4Ø:A$=A$+CHR$(
RND(7)*16+143):NEXT:A$=A$+STRING
$(2Ø,128)
54Ø IF R<5 THEN PRINT@48Ø,B$;:G=
2:SV=S/2-5 ELSE G=1:SV=S
55Ø REM PRINT SHIPS LEFT
56Ø PRINT@496+(5-SH)*3,LEFT$(SH$
,3*SH);:GOTO 23Ø
57Ø REM  SHIP DESTROYED
58Ø FOR Z=1 TO 1Ø:PRINT@258,CHR$
(RND(7)*16+RND(14)+128);:SOUND12
Ø-Z*1Ø,1:FOR ZZ=1 TO 5Ø:NEXT:NEX
T:SH=SH-1:S=S+1Ø:R=R-1:S1=S1-1
59Ø IF SH<1 THEN 61Ø ELSE RETURN
6ØØ REM YOU LOST
61Ø CLSØ:PRINT@96,"all"CHR$(128)
"your"CHR$(128)"ships"CHR$(128)"
were"CHR$(128)"destroyed";:PRINT
@128,"before"CHR$(128)"the"CHR$(
128);
615 PRINT"satellite"CHR$(128)"ce
ased"CHR$(128)"to";:PRINT@16Ø,"f
unction";:PRINT@23Ø,"earth"CHR$(
128)"was"CHR$(128)"destroyed";
62Ø A=359
63Ø REM FINAL SCORE
64Ø PRINT@A,"your"CHR$(128)"scor
e"CHR$(128);M;
65Ø REM NEXT GAME
66Ø PRINT@5ØØ,"continued";
67Ø Q$=INKEY$
68Ø IF INKEY$="" THEN 68Ø
69Ø CLSØ:PRINT@1Ø6,"ANOTHER GAME
 ?";
7ØØ Q$=INKEY$:IF Q$="" THEN 7ØØ
ELSE IF Q$="Y" THEN 2ØØ  ELSE I
F Q$="N" THEN END ELSE 7ØØ
71Ø REM YOU'VE WON
72Ø CLSØ:PRINT@17Ø,"congratulati
ons";:PRINT@234,"earth"CHR$(128)
"was"CHR$(128)"saved";:A=361:GOT
O64Ø
```

```
     **** SIRIUS ADVENTURE ****

          COLOUR COMPUTER


10 REM    SIRIUS ADVENTURE
20 REM (C) MAY 1983 MLADEN BAUK.

30 REM      HI-RES WRITER 1.1
       (C) 1983 G.D. WILLIAMSON

40 REM MODIFIED FOR THE COLOUR
       COMPUTER BY -- MICRO-80

50 A=PEEK(&H1B)*256+PEEK(&H1C)-&
H4CD
60 DEFUSR0=A:DEFUSR1=A+&H1D:A=US
R0(0):PMODE2,1:PCLS:SCREEN1,1
70 PRINT@64,"  S I R I U S ":PRI
NT@128,"   ADVENTURE":FOR X=1TO2
000:NEXT:PMODE4,1:PCLS:SCREEN1,1
80 CLEAR 200: VB=22: ND=26: L=21
: OB=6: LN=337
90 CLS: PRINT@8,"Sirius Adventur
e": PM$=">": PF$=" "
100 PRINT@130,"Press:  <I> nstru
ctions  or"
110 PRINT@170,"<B> egin.": CL$="
        "
120 DIM A$(VB), B$(ND), L$(L), B
(OB): GOSUB 1430
130 A$= INKEY$: IF A$="" THEN 13
0
140 IF A$="I" THEN 1720
150 IF A$< >"B" THEN 130
160 PCLS
170 IF LO=OL THEN 270
180 OL=LO:PCLS: PRINT@8,"Sirius
Adventure"
190 IF LO>4 AND B(1)< > -1 THEN
PRINT: PRINT"     It's too dark
to see!": GOTO 270
200 PRINT"I am ...":PRINTL$(LO)
210 LINE(0,100)-(256,100),PSET
220 TR=0: PRINT@448,CL$;: PRINT@
448,"Visible objects >>> ";
230 FOR I=1 TO OB
240 IF B(I)=LO THEN PRINTB$(I);"
.  ";: TR= -1
250 NEXT I
260 IF TR< > -1 THEN PRINT@468,"
None.";
270 PRINT@320,"What should I do?
";CL$;: C$="":GOSUB 1900: PRINT:
 PRINT
280 IF C$="" THEN PRINT"Huh?": G
OTO 270
290 FOR I=1 TO LEN(C$): IF ASC(
MID$( C$, I, 1))=32 THEN 310
300 NEXT I: GOTO 320
310 LE$= LEFT$( C$, I-1): RI$= M
ID$( C$, I+1, LEN(C$)- LEN(LE$)-
1):GOTO 330
320 LE$= LEFT$(C$, I): RI$=""
330 L= LEN(LE$): IF RI$="" THEN
R= -1 ELSE R= LEN(RI$)
340 FOR I=1 TO VB: IF L> LEN(A$(
I)) THEN 360
350 IF LE$< > LEFT$(A$(I),L) THE
N 360 ELSE 380
360 NEXT I
370 IF C$< >"" THEN PRINT"I don'
t understand "CHR$(34);C$;CHR$(3
4)", check my vocabulary.": GOTO
 270
380 IF R= -1 THEN 420
390 FOR J=1 TO ND
400 IF RI$< >B$(J) THEN NEXT J E
LSE 420
410 PRINT"I don't understand "CH
R$(34);RI$;CHR$(34)", check my v
ocabulary.": GOTO 270
420 ON I GOSUB 450,450,450,450,8
30,880,880,880,950,950,950,950,9
80,1050,980,1230,980,1120,1160,1
290,1360,2010
430 IF I>4 AND I<13 THEN 210
440 IF I=22 THEN 180 ELSE 170
450 IF J<OB+1 THEN PRINT"I can't
 "CHR$(34);A$(I)+" ";RI$;CHR$(34
)"!": GOTO 270
460 J=J-OB: ON J GOTO 550,640,71
0,750,550,640,710,750,470,490,51
0,530,470,490,510,530,790,810,79
0,810
470 IF LO=13 THEN LO=11 ELSE GOS
UB 1860
480 RETURN
490 IF LO=12 THEN LO=11 ELSE IF
LO=14 THEN LO=15 ELSE GOSUB 1860
500 RETURN
510 IF LO=11 THEN LO=12 ELSE IF
LO=15 THEN LO=14 ELSE GOSUB 1860
520 RETURN
530 IF LO=11 THEN LO=13 ELSE GOS
UB 1860
540 RETURN
550 IF LO=2 THEN LO=1 ELSE IF LO
=5 THEN LO=4 ELSE IF LO=6 THEN L
O=5
560 IF LO=7 THEN LO=9 ELSE IF LO
=11 THEN LO=7
570 IF LO=16 AND B(4)= -1 THEN G
OSUB 1870
580 IF LO=16 AND B(4)< > -1 THEN
 LO=17
590 IF LO=18 AND B(5)= -1 THEN L
O=19
600 IF LO=18 AND B(5)< > -1 THEN
 GOSUB 1870
610 IF LO=15 THEN LO=16
620 IF LO=OL THEN GOSUB 1860
630 RETURN
640 IF LO=1 THEN LO=2 ELSE IF LO
=4 THEN LO=5 ELSE IF LO=5 THEN L
O=6
650 IF LO=9 THEN LO=7 ELSE IF LO
=7 THEN LO=11 ELSE IF LO=16 THEN
 LO=15
660 IF LO=17 THEN LO=16
670 IF LO=19 AND B(5)= -1 THEN L
O=18
680 IF LO=19 AND B(5)< > -1 THEN
 GOSUB 1870
690 IF LO=OL THEN GOSUB 1860
700 RETURN
710 IF LO=3 THEN LO=2 ELSE IF LO
=4 THEN LO=3 ELSE IF LO=10 THEN
LO=7
720 IF LO=7 THEN LO=8 ELSE IF LO
=19 THEN LO=20 ELSE IF LO=20 THE
N LO=21
730 IF LO=OL THEN GOSUB 1860
740 RETURN
750 IF LO=2 THEN LO=3 ELSE IF LO
=3 THEN LO=4 ELSE IF LO=7 THEN L
O=10
760 IF LO=8 THEN LO=7 ELSE IF LO
=20 THEN LO=19 ELSE IF LO=21 THE
N LO=20
770 IF LO=OL THEN GOSUB 1860
780 RETURN
790 IF LO=7 THEN LO=6 ELSE IF LO
=18 THEN LO=17 ELSE GOSUB 1860
800 RETURN
810 IF LO=6 THEN LO=7 ELSE IF LO
=17 THEN LO=18 ELSE GOSUB 1860
820 RETURN
830 IF J=0 THEN J=3
840 IF J< >2 THEN PRINT"I can't
eat that, stupid.": RETURN
850 IF J=2 AND B(J)=0 THEN PRINT
"I already ate it.":RETURN
860 IF J=2 THEN PRINT"Munch, cho
mp, <BURP> - the creambun was de
licious!": B(2)=0: RETURN
870 PRINT"ERROR": STOP
880 IF J>OB THEN PRINT"I can't "
CHR$(34);C$;CHR$(34)".": RETURN
890 IF B(J)= -1 THEN PRINT"I alr
eady have it!": RETURN
900 IF B(J)< >LO THEN PRINT"I ca
n't see the ":PRINTB$(J)" here."
:RETURN
910 IT=1: FOR I9=1 TO OB: IF B(I
9)= -1 THEN IT=IT+1: NEXT I9 ELS
E NEXT I9
920 IF IT>3 THEN PRINT"I am carr
ying too much, check   inventory
.":RETURN
```

```
93Ø PRINT"Ok.  I add a "B$(J):PR
INT"to my inventory."
94Ø B(J)= -1: RETURN
95Ø IF J>OB THEN PRINT"I can't "
CHR$(34);C$;CHR$(34)".": RETURN
96Ø IF B(J)< > -1 THEN PRINT"I d
on't have a "RI$: RETURN
97Ø B(J)=LO: PRINT"Ok": RETURN
98Ø IF J>OB THEN PRINT"I don't s
ee anything special.": RETURN
99Ø IF B(J)< > -1 THEN PRINT"I a
m not carrying a "B$(J): RETURN
1ØØØ ON J GOTO 1Ø1Ø,1Ø2Ø,1Ø3Ø,1Ø
3Ø,1Ø3Ø,1Ø4Ø
1Ø1Ø PRINT"It burns brightly.":
RETURN
1Ø2Ø PRINT"It looks tasty!": RET
URN
1Ø3Ø PRINT"Magic seems to emanat
e from the "B$(J): RETURN
1Ø4Ø PRINT"Its beautiful!": RETU
RN
1Ø5Ø IF J>OB THEN PRINT"You are
being silly.": RETURN
1Ø6Ø IF B(J)< > -1 THEN PRINT"I
don't have the "B$(J)".": RETURN
1Ø7Ø IF J< >3 THEN PRINT"Waving
the "B$(J):PRINT" is not very re
warding.": RETURN
1Ø8Ø PRINT"The room dims and blu
rs, and...";
1Ø9Ø FOR I=1 TO 1ØØØ: NEXT I
11ØØ IF LO=13 THEN LO=14 ELSE IF
 LO=14 THEN LO=13 ELSE PRINT"not
hing happens.": RETURN
111Ø PRINT"I am magically transp
orted!": FOR I=1 TO 1ØØØ: NEXT I
: RETURN
112Ø PRINT"Confirm  <Y/N> ?";: C
$="": PRINT@LN,CL$: GOSUB 19ØØ
113Ø IF C$="Y" THEN A=USR1(Ø):CL
S: END
114Ø IF C$< >"N" THEN 112Ø
115Ø PRINT:PRINT:PRINT"Confirm
<CANCELLED>": RETURN
116Ø IN=Ø: FOR I9=4 TO 6
117Ø IF B(I9)=1 THEN IN=IN+2Ø
118Ø NEXT I9
119Ø IF IN=6Ø THEN PRINT"Fantast
ic'  you have solved the adventu
re!"
12ØØ PRINT"You have"IN"points ":
PRINT"out of a possible 6Ø."
121Ø IF IN=6Ø THEN A=USR1(Ø):CLS
: END
122Ø RETURN
123Ø PRINT"I am carrying >>> ";
124Ø IN=Ø: FOR I9=1 TO OB
```

```
125Ø IF B(I9)= -1 THEN PRINT"A "
B$(I9);".  ";: IN= -1
126Ø NEXT I9
127Ø IF IN< > -1 THEN PRINT"Noth
ing at all.": RETURN
128Ø RETURN
129Ø PRINT"Ready tape...press <E
NTER>"
13ØØ IN$= INKEY$:IFIN$=""THEN13Ø
Ø
131Ø OPEN"O",#-1,"URLORD"
132Ø FOR I9=1 TO OB: PRINT#-1,B(
I9);:NEXT I9
133Ø PRINT#-1,LO
134Ø CLOSE#-1
135Ø RETURN
136Ø PRINT"Ready tape...press <E
NTER>"
137Ø IN$= INKEY$:IFIN$=""THEN137
Ø
138Ø OPEN"I",#-1,"URLORD"
139Ø FOR I9=1 TO OB:INPUT#-1,B(I
9):NEXT I9
14ØØ INPUT#-1,LO
141Ø CLOSE#-1
142Ø RETURN
143Ø LO=1
144Ø FOR I=1 TO VB: READ A$(I):
NEXT I
145Ø FOR I=1 TO ND: READ B$(I):
NEXT I
146Ø DATA GO,WALK,RUN,CRAWL,EAT,
GET,TAKE,GRAB,DROP,THROW,PUT,LEA
VE,LOOK,WAVE,EXAMINE,INVENTORY,I
NSPECT,QUIT,SCORE,SAVE,LOAD,VOCA
BULARY
147Ø DATA LAMP,BUN,ROD,RING,STAT
UE,CROWN,N,S,W,E,NORTH,SOUTH,WES
T,EAST,NW,NE,SW,SE,NORTHWEST,NOR
THEAST,SOUTHWEST,SOUTHEAST,UP,DO
WN,U,D
148Ø DATA 1,6,9,8,12,21
149Ø FOR I=1 TO OB: READ B(I): N
EXT I
15ØØ FOR I=1 TO L: READ L$(I): N
EXT I: RETURN
151Ø DATA "at a plateau near a c
liff.      A rocky path leads so
uth. Some  obvious exits: South.
"
152Ø DATA "on a rocky path leadi
ng north   and curving to the ea
st. Some   obvious exits: North.
 East."
153Ø DATA "at the entrance to a
dark cave. A rocky path to the w
est curves north. There is a sli
ght breeze.Some obvious exits: W
est. East."
```

```
154Ø DATA "just inside a dark ca
ve.   Lightcomes from an entranc
e to the   west.  There is a dan
k, mouldy  smell.  A tunnel lead
s south.   Some obvious exits: W
est. South."
155Ø DATA "in a low north/south
tunnel.    Some obvious exits: N
orth. South"
156Ø DATA "in an oval cavern.
There is a forbidding stone stai
rcase here.Some obvious exits: N
orth. Down."
157Ø DATA "in a high,square cave
 with wallsof frozen ice.There a
re passagesin many directions.So
me obvious exits: North.South.We
st.East.Up."
158Ø DATA "in a triangular side-
chamber.   Some obvious exits: E
ast."
159Ø DATA "in a musty-smelling a
lcove.Some obvious exits: South.
"
16ØØ DATA "in an eerie chamber -
 small      squealing sounds come
 from the   walls.Some obvious ex
its: West."
161Ø DATA "in an enormous cave.
 There is  a double pillar of gr
een stone  down the centre.Some
obvious    exits: North. Southwe
st.        Southeast."
162Ø DATA "in a malodourous tunn
el. Some   obvious exits: Northe
ast."
163Ø DATA "in a room in which th
e only     VISIBLE exit is the w
ay I came  in.Some obvious exits
: Northwest"
164Ø DATA "in a secret room,reac
hed only bymagical means.Some ob
vious      exits: Northeast."
165Ø DATA "in a octagonal room.S
ome obviousexits: North. Southwe
st."
166Ø DATA "in an enormous misty
cavern.    Mist obscures the cei
ling. Some obvious exits: North.
 South."
167Ø DATA "in a tiny box-shaped
room. Door leads south and stair
s lead downSome obvious exits: S
outh. Down."
168Ø DATA "in a strange room.  t
here is a  faint whiff of chlori
ne. Some   obvious exits: North.
 Up."
```

```
1690 DATA "in a steamy chamber,
with warm  walls. Some obvious e
xits: West.South."
1700 DATA "in a large room, litt
ered with  alabaster slabs. Some
 obvious   exits: West. East."
1710 DATA "in the throne room of
 the evil  Urlord!  A low door l
eads east. Some obvious exits: E
ast."
1720 PCLS:PRINT@0,"";:PRINT"Your
 quest is to explore the    cave
 of the evil Urlord, and"
1730 PRINT"bring back to the edg
e of the   cliff the following v
aluables:"
1740 PRINT"1. The white gold rin
g."
1750 PRINT"2. The sacred silver
statue."
1760 PRINT"3. The jewelled crown
 of the        Urlord.";
1770 PRINT:PRINT
1780 PRINT"Be careful...":PRINT:
PRINT:PRINT
1790 PRINT"Press  <C> ontinue."
1800 FOR I=1 TO 4000
1810 A$= INKEY$: IF A$="" THEN 1
840
1820 IF A$< >"C" THEN 1810
1830 GOTO 170
1840 NEXT I
1850 GOTO 170
1860 PRINT"You cannot go in that
 direction.": RETURN
1870 PRINT"An invisible force pr
events you from passing."
1880 FOR I=1 TO 1000: NEXT I
1890 RETURN
1900 PRINT@LN+LEN(C$),PM$;
1910 A$= INKEY$: IF A$="" THEN 1
910
1920 PRINT@LN+LEN(C$),PF$;: A=AS
C(A$)
1930 IF A>31 THEN 1990
1940 IF A=8 AND LEN(C$)>0 THEN C
$= LEFT$(C$,LEN(C$)-1): PRINT@LN
,CL$;:PRINT@LN,C$;: GOTO 1900 EL
SE IF A=8 THEN 1900
1950 IF A=13 THEN GOSUB2040:PRIN
T@320,"";:FOR Q=1TO8:PRINT"
                             ";:PRI
NT@320,"";:NEXT: RETURN
1960 IF A=10 THEN A$= CHR$(92) E
LSE IF A=27 THEN A$="@"
1970 IF A=9 THEN A$= CHR$(187) E
LSE IF A=31 THEN A$="%"
1980 IF A=24 THEN C$="": PRINT@L
N,CL$;: GOTO 1900
```

```
1990 C$=C$+A$: IF LEN(C$)>20 THE
N RETURN
2000 PRINT@LN,C$;: GOTO 1900
2010 PCLS:PRINT@8,A$(22):PRINT@6
4,;
2020 FOR I9=1 TO VB: PRINT A$(I9
),: NEXT I9
2030 A$= INKEY$:IF A$="" THEN 20
30 ELSE RETURN
2040 X=(PEEK(39)*256+PEEK(40))-(
PEEK(33)*256+PEEK(34)):RETURN
```

****** MC-10 VADERS ******

MC-10

```
10 ' (C) 1/11/83
     SUNBURST SOFTWARE SERVICES

20 GOSUB520
30 CLEAR500
40 OK=-1:GO=-1:Y=29
50 KK=1
60 K1=16946:K2=16948:K3=16952:PO
KEK1,0:POKEK2,0:POKEK3,0
70 CLS(0)
80 O=0:GOSUB300:V1$=TF$:O=16:GOS
UB300:V2$=TF$:O=32:GOSUB300:V3$=
TF$:O=48:GOSUB300:V4$=TF$:O=64:G
OSUB300:V5$=TF$:O=80:GOSUB300
90 V6$=TF$:O=96:GOSUB300:V7$=TF$
100 BL$=CHR$(128)+CHR$(128)
110 GN$=CHR$(247)+CHR$(242)
120 GP=490
130 P=1
140 GOSUB150:GOTO170
150 DL$=BL$+BL$+BL$+V1$+BL$+BL$+
V2$+BL$+BL$+V3$+BL$+BL$+V4$+BL$+
BL$+V5$+BL$+BL$+V6$+BL$+BL$+V7$+
BL$+BL$+BL$
160 RETURN
170 PRINT@GP,GN$;
180 I=I+1:IFI=50THENI=0:CLS(0):K
=K+32:KK=KK+2:Y=29:F=0:GO=-1:IFK
=448THENGOTO460
190 PRINT@K,MID$(DL$,P,32);
200 IFOKTHENP=P+1:IFP+20=LEN(DL$
)THENOK=0
210 IFNOTOKTHENP=P-1:IFP=1THENOK
=-1
220 IFPEEK(K1)=254THENPRINT@GP,B
L$;:GP=GP-1:POKEK1,0:IFGP=479THE
NGP=480
```

```
230 IFPEEK(K2)=251THENPRINT@GP,B
L$;:GP=GP+1:POKEK2,0:IFGP=510THE
NGP=509
240 IFGOTHENIFPEEK(K3)=247THENM=
GP-480:M=M*2:M=M+1:GO=0:F=-1:POK
EK3,0
250 POKE17023,0:SOUND100,1:SOUND
200,1
260 IFFTHENY=Y-1:IFY<KK+2THENGOS
UB310
270 IFFTHENSET(M,Y,1):RESET(M,Y+
1)
280 IFY=KKTHENGO=-1:F=0:Y=29
290 GOTO170
300 TF$=CHR$(137+O)+CHR$(136+O):
RETURN
310 S=POINT(M,Y-1)
320 ONS+1GOTO330,340,350,360,370
,380,390,410
330 RETURN
340 V1$=BL$:GOTO430
350 V2$=BL$:GOTO430
360 V3$=BL$:GOTO430
370 V4$=BL$:GOTO430
380 V5$=BL$:GOTO430
390 V6$=BL$:GOTO430
400 CLS(0)
410 V7$=BL$
420 F=0:GO=-1
430 GOSUB150:SOUND20,2:SOUND10,4
:SC=SC+10:IFSC=70THENGOTO450
440 RETURN
450 CLS:PRINT"YOU WIN. YOUR SCOR
E WAS 100":GOTO470
460 CLS:PRINT"YOU LOST. YOUR SCO
RE WAS ";SC
470 PRINT"PLAY AGAIN (Y/N)"
480 IN$=INKEY$:IFIN$=""THEN480
490 IFIN$="Y"THENRUN30
500 CLS:PRINT"BYE"
510 END
520 CLS:PRINT"****** MC 10 MICRO
 VADERS ******";
530 PRINT:PRINT"SHOOT DOWN ALL O
F THE INVADERS  BEFORE THEY LAND
 TO WIN.       10 POINTS FOR EA
CH INVADER THAT"
540 PRINT"IS DESTROYED. A BONUS
OF 30      POINTS IS AWARDED FOR
DESTROYINGALL THE INVADERS. MAXI
MUM SCORE IS 100"
550 PRINT"PRESS <A> TO MOVE LEFT
          PRESS <S> TO MOVE RIGH
T         PRESS THE SPACE BAR TO
 FIRE"
560 PRINT:PRINT"PRESS ANY KEY TO
 BEGIN"
570 IN$=INKEY$:IFIN$=""THEN570
580 RETURN
```

**** L2/4K BOLD TYPE FOR THE LPVII ****

TRS-8Ø/SYSTEM-8Ø

```
1Ø LPRINT"THIS IS A ";:P$="TEST":GOSUB1ØØØ
2Ø LPRINT" OF THE ";:P$="BOLD TYPE":GOSUB1ØØØ
3Ø LPRINT" SUBROUTINE":END
999 STOP:'
****************************************
* THIS SUBROUTINE PRINTS P$ IN BOLD TYPE. *
* WRITTEN BY GEORGE DAU.  19-3-83 FOR THE *
* LINE PRINTER VII.                       *
****************************************
1ØØØ
  ZP = PEEK(16539):
  IF LEN(P$)+ZP > 8Ø THEN
    PRINT CHR$(13);"P$ TOO LONG.":
    END
  ELSE
    ZS$ = STRING$(ZP,32):
    FOR Z = 1 TO 3:
      POKE 16539,Ø:
      LPRINT CHR$(26);ZS$;P$;:
    NEXT Z:
    POKE 16539,PEEK(16539)-1:
  RETURN
```

**** 48K/DISK SPACE UTILITY ****

TRS-8Ø/SYSTEM-8Ø

```
ØØ1ØØ ;               SPACE/ED  48K DISK
ØØ11Ø ;
ØØ12Ø ;       DENNIS BAREIS (C)
ØØ13Ø ;       286 LENNOX ST
ØØ14Ø ;       MARYBOROUGH,465Ø.
ØØ15Ø ;
ØØ16Ø ;       THIS PROGRAM WILL ADD SPACES TO A BASIC PROGRAM
ØØ17Ø ;       TO MAKE IT READABLE. IT WILL NOT ADD SPACES IF
ØØ18Ø ;       THERE IS ALREADY A SPACE. SPACES ARE INSERTED
ØØ19Ø ;       AROUND BASIC KEYWORDS.
ØØ2ØØ ;       SINCE SOME PROGRAMS HAVE M/L AFTER REM STATEMENTS
ØØ21Ø ;       IT WILL NOT ADD SPACES TO A LINE AFTER IT HAS
ØØ22Ø ;       FOUND A REM STAT., BUT ANY SPACES ADDED BEFORE
ØØ23Ø ;       THE REM WILL HAVE TO BE REMOVED.
ØØ24Ø
ØØ25Ø ;       YOUR BASIC PROGRAM WILL STILL RUN AFTER YOU
ØØ26Ø ;       HAVE PUT THE SPACES IN.
ØØ27Ø ;       THIS PROGRAM SHOULD NOT BE USED TO SPACE OUT
ØØ28Ø ;       BASIC PROGRAMS WITH VERY LONG LINES, AS THEY
ØØ29Ø ;       MAY BECOME TOO LONG WITH THE EXTRA SPACES.
ØØ3ØØ ;       ## NOTE-CMD"SPACE" DOES NOT WORK FROM NEWDOS-8Ø,
ØØ31Ø ;       BUT MUST BE RUN WHILE IN DOS.
ØØ32Ø
ØØ33Ø ; ##    TO USE FROM DISK BASIC
ØØ34Ø ; ##    1/LOAD BASIC PROGRAM
ØØ35Ø ; ##    2/TYPE CMD"S"
ØØ36Ø ; ##    3/TYPE SPACE (TO RUN PROGRAM)
ØØ37Ø ; ##    4/TYPE BASIC *
ØØ38Ø ; ##    TO MOD FOR LEVEL2 CHANGE THE ORIGIN IN
ØØ39Ø ; ##    LINE 29Ø TO SAY 75ØØH,AND CHANGE LINE 33Ø
ØØ4ØØ ; ##    TO ' DOS   EQU   Ø6CCH '
ØØ41Ø
ØØ42Ø         ORG     ØFØØØH
ØØ43Ø SBASIC  EQU     4ØA4H             ;START OF BASIC PTR
ØØ44Ø EBASIC  EQU     4ØF9H             ;END OF BASIC PTR
ØØ45Ø FIXPTR  EQU     1AF8H             ;ADJUSTS PTRS
ØØ46Ø DOS     EQU     4Ø2DH             ;RETURNS HERE AT END.
ØØ47Ø
ØØ48Ø NBYTES  LD      DE,(SBASIC)
ØØ49Ø         LD      HL,(EBASIC)
ØØ5ØØ         OR      A
ØØ51Ø         SBC     HL,DE
ØØ52Ø         INC     HL
ØØ53Ø         PUSH    HL
ØØ54Ø         POP     BC                ;NO. BYTES TO MOVE
ØØ55Ø         RET
ØØ56Ø MOVE    CALL    NBYTES
ØØ57Ø         LD      HL,(EBASIC)       ;SOURCE
ØØ58Ø         LD      DE,CUT-1          ;DESTINATION
ØØ59Ø CUT     LDDR                      ;BLOCK MOVE
ØØ6ØØ         INC     HL                ;POINTS TO START BASIC
ØØ61Ø         INC     DE                ;PTS TO START BAS PROG.
ØØ62Ø         RET
ØØ63Ø START   DI
ØØ64Ø         CALL    MOVE              ;MOVE BASIC PROG
ØØ65Ø LOOP1   LD      B,4H
ØØ66Ø LOOP8   XOR     A
ØØ67Ø         LD      (COUNT),A         ;ZERO COUNT OF "
ØØ68Ø         LD      (REM),A           ;ZERO REM
ØØ69Ø LOOP3   LD      A,(DE)
ØØ7ØØ         LD      (HL),A
ØØ71Ø         INC     HL
ØØ72Ø         INC     DE
ØØ73Ø         DJNZ    LOOP3             ;MISS LINE NO. & PTR
ØØ74Ø LOOP2   LD      A,(DE)            ;GET BYTE OF BAS PROG
ØØ75Ø         CP      22H               ;TEST FOR "
ØØ76Ø         JR      NZ,SKIP
ØØ77Ø         PUSH    AF
ØØ78Ø         LD      A,(COUNT)
ØØ79Ø         XOR     Ø1H               ;COUNTS (EVEN , ODD)
ØØ8ØØ         LD      (COUNT),A
ØØ81Ø         POP     AF
ØØ82Ø SKIP    CP      8ØH               ;TEST FOR KEYWORD
ØØ83Ø         JR      NC,KEYWRD
```

```
ØØ84Ø          CP      3AH           ;WANT SPACE AROUND :
ØØ85Ø          JR      Z,COLON
ØØ86Ø          CP      ØH            ;POSSIBLE END OF PROG
ØØ87Ø          JR      Z,ENDPRG
ØØ88Ø LOOP6    LD      (HL),A        ;STORE BYTE
ØØ89Ø          INC     HL
ØØ9ØØ          INC     DE
ØØ91Ø LOOP7    INC     B             ;IF B=Ø,FIRST BYTE IN LN
ØØ92Ø          JR      LOOP2
ØØ93Ø
ØØ94Ø KEYWRD   LD      A,(COUNT)
ØØ95Ø          CP      ØH
ØØ96Ø          LD      A,(DE)
ØØ97Ø          JR      NZ,LOOP6      ;DO NOT ADD SPACE, " ODD
ØØ98Ø          CP      93H           ;REM TOKEN
ØØ99Ø          JR      NZ,NOTREM
Ø1ØØØ          LD      A,ØFFH
Ø1Ø1Ø          LD      (REM),A
Ø1Ø2Ø NOTREM   CP      95H
Ø1Ø3Ø          JR      Z,ELSE        ;NO SPC BETWEEN : & ELSE
Ø1Ø4Ø          LD      A,(REM)
Ø1Ø5Ø          CP      ØH            ;ZERO IF NO REM IN LINE
Ø1Ø6Ø          LD      A,(DE)
Ø1Ø7Ø          JR      NZ,LOOP6      ;COULD BE M/L AFTER REM
Ø1Ø8Ø          LD      A,B
Ø1Ø9Ø          CP      ØH
Ø11ØØ          JR      Z,SKIP2       ;NO SPACE AT START LINE
Ø111Ø          DEC     HL
Ø112Ø          LD      A,(HL)
Ø113Ø          CP      2ØH           ;TEST IF SPACE BEFORE
Ø114Ø          JR      Z,SPACE1      ;ALREADY SPACE BEFORE KWRD
Ø115Ø          INC     HL
Ø116Ø          LD      (HL),2ØH      ;NO SPACE,ADD ONE
Ø117Ø SPACE1   INC     HL
Ø118Ø SKIP2    LD      A,(DE)        ;GET KEY WORD
Ø119Ø          LD      (HL),A
Ø12ØØ          INC     HL
Ø121Ø          INC     DE
Ø122Ø          CP      ØD7H          ;NO SPACE AFTER THESE KEY
Ø123Ø          JR      NC,LOOP2      ;NO SPACE BEFORE BRACKET
Ø124Ø          CP      ØBCH          ;NO SPACE AFTER TAB(
Ø125Ø          JR      Z,LOOP2
Ø126Ø          LD      A,(DE)
Ø127Ø          CP      2ØH           ;TEST SPC AFTER KEYWORD
Ø128Ø          JR      Z,LOOP2
Ø129Ø          LD      (HL),2ØH      ;NO SPACE, ADD SPACE
Ø13ØØ          INC     HL
Ø131Ø          JR      LOOP7
Ø132Ø
Ø133Ø ELSE     DEC     HL
Ø134Ø          JR      SKIP2
Ø135Ø
Ø136Ø ENDPRG   DEC     HL
Ø137Ø          LD      A,(HL)
Ø138Ø          CP      ' '           ;SEE IF SPACE AT END LN
Ø139Ø          JR      Z,SPC         ;DEL SPC(LEAVE HL AS IS)
Ø14ØØ          INC     HL
Ø141Ø SPC      LD      A,(DE)
Ø142Ø          LD      (HL),A
Ø143Ø          INC     HL
Ø144Ø          INC     DE
Ø145Ø          LD      A,(DE)
Ø146Ø          CP      Ø
Ø147Ø          JP      NZ,LOOP1
Ø148Ø          LD      (HL),A
Ø149Ø          INC     HL
Ø15ØØ          INC     DE
Ø151Ø          LD      A,(DE)
Ø152Ø          CP      ØH
Ø153Ø          JR      NZ,LOOP5
Ø154Ø          LD      (HL),A
Ø155Ø          INC     HL
Ø156Ø          LD      (EBASIC),HL   ;ADJUST END BAS PTR
Ø157Ø          LD      (4ØFBH),HL    ;ADJUST ARRAY PTR
Ø158Ø          LD      (4ØFDH),HL    ;ADJUST FREE SPACE PTR
Ø159Ø          CALL    FIXPTR
Ø16ØØ          EI
Ø161Ø          JP      DOS
Ø162Ø
Ø163Ø LOOP5    LD      B,3H
Ø164Ø          JP      LOOP8
Ø165Ø COLON    XOR     A
Ø166Ø          LD      (COUNT),A     ;ZERO COUNT OF "
Ø167Ø          JR      KEYWRD
Ø168Ø COUNT    DEFB    ØH            ;Ø=EVEN ,1=ODD
Ø169Ø REM      DEFB    ØØH           ;Ø=NO REM IN LINE
Ø17ØØ          END     START
```

```
SPACE DUMP

START   END    ENTRY
FØØØ    FØCC   FØ1C


FØØØ:  ED 5B A4 4Ø 2A F9 4Ø B7 ED 52 23 E5 C1 C9 CD ØØ
FØ1Ø:  FØ 2A F9 4Ø 11 16 FØ ED B8 23 13 C9 F3 CD ØE FØ
FØ2Ø:  Ø6 Ø4 AF 32 CB FØ 32 CC FØ 1A 77 23 13 1Ø FA 1A
FØ3Ø:  FE 22 2Ø ØA F5 3A CB FØ EE Ø1 32 CB FØ F1 FE 8Ø
FØ4Ø:  3Ø ØE FE 3A 28 7F FE ØØ 28 4B 77 23 13 Ø4 18 DF
FØ5Ø:  3A CB FØ FE ØØ 1A 2Ø F2 FE 93 2Ø Ø5 3E FF 32 CC
FØ6Ø:  FØ FE 95 28 2D 3A CC FØ FE ØØ 1A 2Ø DD 78 FE ØØ
FØ7Ø:  28 ØA 2B 7E FE 2Ø 28 Ø3 23 36 2Ø 23 1A 77 23 13
FØ8Ø:  FE D7 3Ø AB FE BC 28 A7 1A FE 2Ø 28 A2 36 2Ø 23
FØ9Ø:  18 BB 2B 18 E7 2B 7E FE 2Ø 28 Ø1 23 1A 77 23 13
FØAØ:  1A FE ØØ C2 2Ø FØ 77 23 13 1A FE ØØ 2Ø 12 77 23
FØBØ:  22 F9 4Ø 22 FB 4Ø 22 FD 4Ø CD F8 1A FB C3 2D 4Ø
FØCØ:  Ø6 Ø3 C3 22 FØ AF 32 CB FØ 18 85 ØØ ØØ
```

**** YAHTZEE ****

MODEL 3

```
1Ø REM..............YAHTZEE/BAS...............................
.............(c) 1982 by Tony Domigan.........................
.............m/l is entered into this line....................
2Ø CLS:CLEAR7ØØ:DEFINTA-Z:RANDOM:DIMP1(15),P2(15):BV=1315Ø:C=-1
```

```
30 BX=176Ø:BW=2555Ø:TEST=PEEK(16548)+PEEK(16549)*256+5:GOTO178Ø
40 YP=1:IF(Z$=P1$ANDP1(12)>C)OR(Z$=P2$ANDP2(12)>C)THEN5ØELSEYF=1
50 IF(Z$=P1$ANDP1(I)=CANDP1(12)>C)THENYG=1:RETURN
60 IF(Z$=P2$ANDP2(I)=CANDP2(12)>C)THENYG=1ELSEYG=Ø
70 RETURN
80 SC=S(1)+S(2)+S(3)+S(4)+S(5):RETURN
90 PRINT@752,K$;:PRINT@88Ø,K$;:PRINT@948,K$;
100 N=N+1:IF(N=1)THENZ$=P1$ELSEIF(N>3ANDN<6)THENZ$=P2$
110 PRINT@948,T1$;Z$;T2$;:IFN=7THENN=Ø:GOTO1ØØ
120 PRINT@337,S$;:JZ=JZ+1:PRINT@37Ø,"Roll No";JZ;
130 IF(JZ=1)THEN25ØELSEIF(JZ=3)THENJZ=Ø
140 Y$="":H$="":GOSUB1Ø3Ø:L$=LEFT$(H$,1)
150 LH=LEN(H$)+C:Y$=RIGHT$(H$,LH):H$=Y$
160 IFL$="R"THEN17ØELSEIFL$="S"THEN121ØELSEPRINT@337,S$;:GOTO14Ø
170 P=121
180 FORJ=1TO5:K(J)=Ø:NEXTJ:FORDI=1TOLEN(Y$)
190 Y1$=LEFT$(Y$,1):Y$=RIGHT$(Y$,LEN(Y$)+C)
200 Y2=VAL(Y1$):K(Y2)=Y2:NEXTDI
210 FORZZ=1TO5
220 IFK(ZZ)<>ØTHENP=(121+(K(ZZ)*12)):GOSUB117Ø
230 NEXTZZ
240 FLAG=Ø:GOTO48Ø
250 PRINT@467,A1$;:PRINT@491,A1$;
260 GG=1:HH=6:WP=Ø:IF(Z$=P1$)THENSU(1)=ØELSESU(2)=Ø
270 GOSUB149Ø
280 GG=7:HH=13:WP=1:IF(Z$=P1$)THENTU(1)=ØELSETU(2)=Ø
290 GOSUB149Ø
300 P=121:FORW=1TO5:P=P+12:PRINT@P,D7$;:NEXTW:GOSUB1Ø3Ø
310 P=121:FORK=1TO5:P=P+12
320 GOSUB34Ø
330 R=RND(6):S(K)=R:ONRGOTO38Ø,39Ø,4ØØ,41Ø,42Ø,43Ø
340 GOSUB148Ø:PRINT@P,D7$;:GOSUB148Ø:PRINT@P,D5$;
350 GOSUB148Ø:PRINT@P,D7$;:GOSUB148Ø:PRINT@P,D2$;
360 GOSUB148Ø:PRINT@P,D7$;:GOSUB148Ø:PRINT@P,D4$;
370 GOSUB148Ø:PRINT@P,D7$;:GOSUB148Ø:RETURN
380 PRINT@P,D1$;:E=USR(BX):GOTO44Ø
390 PRINT@P,D2$;:E=USR(BX):GOTO44Ø
400 PRINT@P,D3$;:E=USR(BX):GOTO44Ø
410 PRINT@P,D4$;:E=USR(BX):GOTO44Ø
420 PRINT@P,D5$;:E=USR(BX):GOTO44Ø
430 PRINT@P,D6$;:E=USR(BX)
440 IF(K=5)THEN45ØELSEX=5Ø:GOSUB141Ø
450 IF(FLAG=1)THENFLAG=Ø:RETURN
460 IF(ST=Ø)THENRETURN
470 NEXTK
480 Q=Q+1:GOSUB164Ø
490 IF(Q=3)THENQ=Ø:GOTO121ØELSEGOTO1ØØ
500 M=Ø:O=Ø
510 FORW=1TO4:IF(S(W)<=S(W+1))THEN53Ø
520 W1=S(W):S(W)=S(W+1):S(W+1)=W1:M=M+1
530 NEXTW
540 IFM>ØTHEN5ØØELSEO=Ø
550 FORF=1TO4:FORG=F+1TO5:IF(S(F)=S(G))THENO=O+1:H=S(F)
560 IF(O=6ORO=3ORO=1)THENI=HELSEIF(O=2)THENII=H
570 NEXTG,F
580 SC=Ø:SV=VAL(H$):IF(SV<1)THEN121Ø
590 IF(SV>ØANDSV<7)THEN61ØELSEIF(SV=13)THEN63Ø
600 IF(SV<13)THEN67ØELSEGOTO121Ø
610 FORW=1TO5:IF(S(W)=SV)THENSC=SC+SV:NEXTWELSESC=SC:NEXTW
620 RETURN
630 IF(O=1)ØTHENGOSUB4ØELSEGOTO66Ø
640 IF(YPANDNOTYG)THEN66Ø:ELSEIF(YG)THENRETURN
650 IF(YF)THENRETURN
660 GOSUB8Ø:RETURN
670 SQ=SV-6:ONSQGOTO69Ø,72Ø,75Ø,79Ø,94Ø,1Ø1Ø
680 GOTO121Ø
690 IF((O=3)OR(O=4)OR(O=6))THENGOSUB8Ø:RETURNELSEGOTO7ØØ
700 IF(O=1Ø)THENGOSUB4ØELSESC=Ø:RETURN
710 IF(YPANDNOTYG)THENGOSUB8Ø:RETURNELSEIF(YG)THENRETURN
720 IF(O=6)THENGOSUB8Ø:RETURNELSEIF(O=1Ø)GOSUB4Ø
730 IF(YPANDNOTYG)THENGOSUB8Ø:RETURNELSESC=Ø:RETURN
740 IF(YF)THENRETURNELSESC=Ø:RETURN
750 IF(O=4)THENSC=25:RETURN
760 IF(O=1Ø)THENGOSUB4ØELSESC=Ø:RETURN
770 IF(YPANDNOTYG)THENSC=25:RETURNELSEIF(YG)THENRETURN
780 IF(YF)THENRETURNELSESC=Ø:RETURN
790 IF(O=1Ø)THENGOSUB4ØELSE82Ø
800 IF(YPANDNOTYG)THENSC=3Ø:RETURNELSEIF(YG)THENRETURN
810 IF(YF)THENRETURN
820 IF(O<>1)THEN9ØØELSEW=Ø
830 W=W+1
840 IF(S(W)=S(W+1)ANDW=4)THEN9ØØELSEIF(S(W)<>S(W+1))THEN83Ø
850 W1=S(W+1):IF(W=1)THENS(2)=S(3):S(3)=S(4):S(4)=S(5):S(5)=W1
860 IF(W=2)THENS(3)=S(4):S(4)=S(5):S(5)=W1
870 IF(W=3)THENS(4)=S(5):S(5)=W1
880 FORW=1TO5:PRINT@26Ø+W*2,S(W);:NEXTW
890 V1=Ø:V2=Ø
900 IF(S(1)+1=S(2)ANDS(2)+1=S(3)ANDS(3)+1=S(4))THENV1=1
910 IF(S(2)+1=S(3)ANDS(3)+1=S(4)ANDS(4)+1=S(5))THENV2=1
920 IF(V1ORV2)THENSC=3ØELSESC=Ø
930 RETURN
940 IF(O>Ø)THENGOTO97Ø
950 IFS(1)=S(2)+CANDS(2)=S(3)+CANDS(4)=S(5)+CTHENSC=4ØELSESC=Ø
960 RETURN
970 IF(O=1Ø)THENGOSUB4ØELSESC=Ø:RETURN
980 IF(YPANDNOTYG)THENSC=4Ø:RETURNELSEIF(YG)THENRETURN
990 IF(YF)THENRETURN
1000 SC=Ø:RETURN
1010 IF(O=1Ø)THENSC=5Ø:RETURN
1020 SC=Ø:RETURN
1030 DE=Ø:PRINT@257,STRING$(6Ø," ");
1040 PRINT@275,"**** ";Z$;" To Go ****";
1050 IF(JZ=1)THENPRINT@338,N$;
1060 DE=DE+1:IF(DE<>1)THEN1Ø7ØELSEE=USR(BV+1Ø)
1070 J$=INKEY$
1080 IFJ$<>CHR$(13)THEN112Ø
1090 IF(LEN(J$)=1ANDJZ=1)THENPRINT@337,S$;:E=USR(BV):RETURN
1100 IF(LEN(H$)>Ø)THENE=USR(BV):RETURN
1110 GOTO1Ø7Ø
1120 IF(J$<>"")THENE=USR(BV)
1130 IF(LEN(H$)=1)THENPRINT@337,S$;ELSEIF(J$="")THEN1Ø7Ø
1140 IF(J$<>CHR$(8))THEN116Ø
1150 IF(LEN(H$)>Ø)THENH$=LEFT$(H$,LEN(H$)+C):PRINT@347,H$;" ";:G
OTO1Ø7ØELSEJ$="":H$="":GOTO1Ø3Ø
1160 H$=H$+J$:IF(LEN(H$)>7)THENH$="":GOTO1Ø3ØELSEPRINT@347,H$;:G
OTO1Ø7Ø
1170 IF(JZ=1)THENPRINT@,337,S$;
1180 R=RND(6):S(ZZ)=R:FLAG=1:GOSUB34Ø
1190 ONRGOTO38Ø,39Ø,4ØØ,41Ø,42Ø,43Ø
1200 RETURN
```

```
1210 YF=Ø:YP=Ø:YG=Ø:PRINT@337,S$;
1220 PRINT@275,Z$;I$;:E=USR(BV+35)
1230 H$="":J$="":GOSUB1070
1240 Y3$=LEFT$(H$,1):IF(Y3$="R"ORY3$="S"ORY3$=CHR$(13))THEN1210
1250 GOSUB500
1260 IF(YFANDNOTYG)THENE=USR(BW):PRINT@337,F$;:GOTO1770
1270 IF(YG)THENE=USR(BW):PRINT@337,"*";I;G$;:GOTO1770
1280 IF(Z$=P1$)THENIF(P1(SV)=C)THENP1(SV)=SCELSEGOTO1400
1290 IF(Z$=P2$)THENIF(P2(SV)=C)THENP2(SV)=SCELSEGOTO1400
1300 GG=1:HH=6:WP=Ø:IF(Z$=P1$)THENSU(1)=ØELSESU(2)=Ø
1310 GOSUB1490
1320 GG=7:HH=13:WP=1:IF(Z$=P1$)THENTU(1)=ØELSETU(2)=Ø
1330 GOSUB1490
1340 IF(N<3)THENN=3:JZ=ØELSEIF(N<6ANDN>3)THENN=6:JZ=Ø
1350 J$="":H$="":Q=Ø:S(W)=Ø:FORW=1TO5:S(W)=Ø:NEXTW
1360 PRINT@338,E$;:PRINT@260,Q$;:E=USR(BV+20)
1370 RE$=INKEY$:IFRE$=""THEN1370
1380 PRINT@337,S$;:QE=QE+1:IF(QE=26)THEN1720
1390 GOTO90
1400 PRINT@337,M$;:E=USR(BW):PRINT@337,S$;:GOTO1220
1410 FORJ=1TOX:NEXTJ:X=Ø:RETURN
1420 'OUT 254,16     REM SYSTEM 80 EXT CASSETTE
1430 FORA=TEXTTOTEXT+28:READB:POKEA,B:NEXT
1440 ONERRORGOTO1450:DEFUSRØ=TEXT:RETURN
1450 POKE 16526,TEXT AND 255 : POKE 16527, INT(TEXT/256) :RETURN
1460 DATA205,127,10,229,193,197,65,16,254,58,61,64,246,2,203
1470 DATA215,211,255,65,16,254,230,253,211,255,193,16,233,201
1480 NZ=1600+RND(55):E=USR(NZ):GOSUB1710:RETURN
1490 FORPQ=GGTOHH:IF(WP=Ø)THENPR=403+PQ*64ELSEPR=427+((PQ-6)*64)
1500 IF(Z$=P1$)THEN1540
1510 IF(P2(PQ)=C)THENQ8=Ø:GOTO1520ELSEPRINT@PR,USINGU$;P2(PQ);:Q
8=P2(PQ)
1520 IF(WP=Ø)THENSU(2)=SU(2)+Q8ELSETU(2)=TU(2)+Q8
1530 GOTO1560
1540 IF(P1(PQ)=C)THENQ8=Ø:GOTO1550ELSEPRINT@PR,USINGU$;P1(PQ);:Q
8=P1(PQ)
1550 IF(WP=Ø)THENSU(1)=SU(1)+Q8ELSETU(1)=TU(1)+Q8
1560 NEXTPQ
1570 IF(Z$=P1$)THENQ4=1ELSEQ4=2
1580 IF(WP)THEN1620ELSEPT(Q4)=Ø
1590 IF(SU(Q4)>=63)THENBS(Q4)=35ELSEBS(Q4)=Ø
1600 PT(Q4)=SU(Q4)+BS(Q4)
1610 PRINT@851,USINGU$;BS(Q4);:PRINT@913,USINGV$;PT(Q4);:RETURN
1620 PRINT@937,USINGV$;TU(Q4);:TS(Q4)=PT(Q4)+TU(Q4)
1630 PRINT@885,USINGV$;TS(Q4);:RETURN
1640 FOREE=1TO5:R(EE)=S(EE):NEXTEE
1650 M=Ø
1660 FORW=1TO4:IF(R(W)<=R(W+1))THEN1680
1670 W1=R(W):R(W)=R(W+1):R(W+1)=W1:M=M+1
1680 NEXTW
1690 IF(M>Ø)THEN1650
1700 FORW=1TO5:PRINT@752+W*2,R(W);:NEXTW
1710 RETURN
1720 PRINT@275,"====  Game Finished  =="
1730 IF(TS(1)>TS(2))THENPRINT@328,P1$;P$;TS(1);X$;TS(2);O$;P2$;
1740 IF(TS(2)>TS(1))THENPRINT@328,P2$;P$;TS(2);X$;TS(1);O$;P1$;
1750 IF(TS(1)=TS(2))THENPRINT@330,PP$;TS(1);PX$;TS(2);PO$;
1760 RE$=INKEY$:IFRE$=""THEN1760ELSERUN
1770 PRINT@337,S$;:YG=Ø:GOTO1210
1780 GOSUB1430
1790 ONERRORGOTO2310
1800 P=858:GOSUB2120
1810 PRINT@275,TI$:GOSUB320:ST=1
1820 E=USR(BV):PRINT@466,;:INPUT"First Players Name ";P1$
1830 E=USR(BV):PRINT@593,;:INPUT"Second Players Name ";P2$
1840 IF(LEN(P1$)>5)THENP1$=LEFT$(P1$,5)
1850 IF(LEN(P2$)>5)THENP2$=LEFT$(P2$,5)
1860 A2=LEN(P1$):IF(A2<5)THEN P1$=P1$+CHR$(32):GOTO1860
1870 A3=LEN(P2$):IF(A3<5)THEN P2$=P2$+CHR$(32):GOTO1870
1880 E=USR(BV):FORZ2=1TO13:P1(Z2)=C:P2(Z2)=P1(Z2):NEXT
1890 X=400:GOSUB1410:CLS
1900 A$=CHR$(188)+STRING$(7,140)+CHR$(188)+CHR$(193)
1910 A$=A$+A$+A$+A$+A$+CHR$(196)
1920 B$=CHR$(191)+CHR$(199)+CHR$(191)+CHR$(195)
1930 B$=B$+B$+B$+B$+B$+CHR$(196)
1940 C$=STRING$(9,131)+CHR$(195)
1950 C$=C$+C$+C$+C$+C$
1960 A$=A$+B$+B$+C$
1970 PRINT@3,A$;
1980 PRINT@199,"1";:PRINT@211,"2";:PRINT@223,"3";:PRINT@235,"4";
:PRINT@247,"5";
1990 PRINT@384,R$;:PRINT@448,;:
2000 PRINT"<1> Aces..........        < 7> 3/Kind......"
2010 PRINT"<2> Two's.........        < 8> 4/Kind......"
2020 PRINT"<3> Three's.......        < 9> F/House....."
2030 PRINT"<4> Four's........        <10> S/Strt....."
2040 PRINT"<5> Fives.........        <11> L/Strt......"
2050 PRINT"<6> Sixes.........        <12> Yahtzee....."
2060 PRINT"    Bonus.........        <13> Chance......"
2070 PRINT"    Subtotal......             Subtotal...."
2080 PRINTR$;:PRINT@496,"Y A H T Z E E";
2090 PRINT@560,"Rnnnn=Roll Dice";:PRINT@624,"S     =Score Dice";
2100 PRINT@688,"Sorted Die Below";:PRINT@816,"   Total Score";
2110 GOTO90
2120 D1$=STRING$(5,128)+CHR$(27)+STRING$(5,24)+STRING$(2,128)+CH
R$(176)+STRING$(2,128)
2130 D2$=STRING$(4,128)+CHR$(140)+CHR$(27)+STRING$(5,24)+CHR$(13
1)+STRING$(4,128)
2140 D3$=STRING$(4,128)+CHR$(140)+CHR$(27)+STRING$(5,24)+CHR$(13
1)+CHR$(128)+CHR$(176)+STRING$(2,128)
2150 D4$=CHR$(140)+STRING$(3,128)+CHR$(140)+CHR$(27)+STRING$(5,2
4)+CHR$(131)+STRING$(3,128)+CHR$(131)
2160 D5$=CHR$(140)+STRING$(3,128)+CHR$(140)+CHR$(27)+STRING$(5,2
4)+CHR$(131)+CHR$(128)+CHR$(176)+CHR$(128)+CHR$(131)
2170 D6$=CHR$(140)+STRING$(3,128)+CHR$(140)+CHR$(27)+STRING$(5,2
4)+CHR$(179)+STRING$(3,128)+CHR$(179)
2180 D7$=STRING$(5,128)+CHR$(27)+STRING$(5,24)+STRING$(5,128)
2190 E$="Press <ENTER> To Clear "
2200 F$="* YAHTZEE Not Yet Scored *"
2210 G$="'s Must Be Scored First "
2220 I$=" Enter Score Please":K$=STRING$(13,32)
2230 M$="   Incorrect  Category":N$="Press  <ENTER> To Start"
2240 P$=" WINS With":X$="Points vs":O$=" Points For "
2250 PP$="** DRAWN GAME **  ":PX$=" VS ":PO$=" Points "
2260 Q$=STRING$(40,32):R$=STRING$(63,140):S$=STRING$(32,32)
2270 T1$=CHR$(143)+CHR$(32):T2$=CHR$(32)+CHR$(143)
2280 U$="##":V$="###":TI$="**** Yahtzee v1.5 ****"
2290 FORA1=1TO8:A1$=A1$+"**"+CHR$(24)+CHR$(24)+CHR$(26):NEXTA1
2300 W$="**":RETURN
2310 PRINT"Error Occurred In ";ERL;" Code";ERR/2+1
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**** VER 5.Ø   HOUSEHOLD ACCOUNTING ****

                    MODEL 4


1Ø CLEAR 5Ø : VV = INT(( MEM - 2ØØØ) / 69) : VV = - VV * (VV < 6
98) - (VV > 697) * 697:REM
MODULEØ/BAS
  THE LARGEST MODULE, (MODULE6/BAS), IS 42Ø3 BYTES LONG

2Ø CLEAR 62 * VV + 7ØØ : VV = INT(( FRE(ZØ$) - 7ØØ) / 62) : DIM
A$(VV + 1),LB(VV + 1) : F3$ = "  #######.##" : F4$ = " $$##,###.
##-" : F5$ = "       " + F3$ + "-"
3Ø W = 1 : SO$ = "Press any key to continue *" : ZØ$ = "Total" :
 Z1$ = "Memory" : Z2$ = "Account" : Z3$ = "Select Function *" :
Z4$ = "Journal" : Z5$ = "Credit" : Z6$ = "Debit" : Z7$ = "Date"
4Ø PRINT CHR$(15)
5Ø GOSUB 23Ø : PRINT @4ØØ,"Maximum number of records = ";VV : PR
INT @8ØØ,SO$; :PRINT@184Ø,"................... Written by  Sunb
urst Software Services ..................";: PA = 826 : LN = 1
: GOSUB 6Ø : GOTO 25Ø
6Ø AD$ = ""
7Ø FOR T = 1 TO LN
8Ø GOSUB 15Ø : IF IN$ = CHR$(13) THEN 13Ø ELSE IF IN$ = CHR$(8)
THEN 11Ø ELSE IF IN$ = CHR$(32) THEN GOSUB 17Ø
9Ø AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
1ØØ NEXT : RETURN
11Ø IF T < = 1 THEN 8Ø ELSE T = T - 1
12Ø AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO
8Ø
13Ø IF FL = Ø THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
14Ø BL$ = STRING$ (LN - LEN(AD$),"Ø") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
15Ø IN$ = "" : IN$ = INKEY$ : GOSUB 16Ø : IF IN$ = "" THEN 15Ø E
LSE RETURN
16Ø PRINT @PA,AD$;;CHR$(143);: RETURN
17Ø IF FL = Ø THEN RETURN
18Ø IN$ = "Ø" : RETURN
19Ø T = 1
2ØØ IF T > 5 THEN AD$ = "    Ø" : RETURN
21Ø IF MID$(AD$,T,1) = "Ø" THEN T = T + 1 : GOTO 2ØØ
22Ø AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
23Ø CLS : PRINT @Ø,"***                 Household Accounting   Ver
5.Ø  for the Model 4            ***"; : PRINT @8Ø,"***         (
C)  1st November 1983       M i c r o - 8 Ø   P t y  L t d
 ***";
24Ø PRINT @16Ø, CHR$(31); : RETURN
25Ø COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,ZØ$,Z1$,Z2$,Z3$,Z4$,Z5
$,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P
26Ø P=Ø:GOSUB 23Ø:PRINT@196,"MENU":PRINT:PRINT:PRINT"1 = Keyboar
d Input              :          5 = Save Data"
27Ø PRINT:PRINT"2 = Load Data                       :        6 =
 Print Journals"
28Ø PRINT:PRINT"3 = Read Memory                     :        7 =
 Lineprinter Utility"
29Ø PRINT:PRINT"4 = Edit Memory                     :        8 =
 Ledger Accounts"
3ØØ PRINT @12ØØ,Z3$; : PA = 1216 : LN = 1 : GOSUB 6Ø
31Ø AD = VAL(AD$) : IF AD < 1 OR AD > 8 THEN 3ØØ
32Ø ON AD GOTO 33Ø,4ØØ,34Ø,35Ø,39Ø,36Ø,37Ø,38Ø
33Ø CHAIN "MODULE1/BAS",ALL
34Ø CHAIN "MODULE3/BAS",ALL
35Ø CHAIN "MODULE4/BAS",ALL
36Ø CHAIN "MODULE6/BAS",ALL
37Ø CHAIN "MODULE7/BAS",ALL
38Ø CHAIN "MODULE8/BAS",ALL
39Ø CHAIN "MODULE5/BAS",ALL
4ØØ CHAIN "MODULE2/BAS",ALL
41Ø REM WRITTEN BY
SUNBURST SOFTWARE SERVICES


1Ø REM                         MODULE1/BAS
2Ø COMMON ZØ$,Z1$,Z2$,Z3$,Z4$,Z5$,Z6$,Z7$,A$(),LB(),DT$,DE$,RF$,
PR$,DB$,CR$,AD$,AD,VV,W
3Ø GOTO 41Ø
4Ø AD$ = ""
5Ø FOR T = 1 TO LN
6Ø GOSUB 13Ø : IF IN$ = CHR$(13) THEN 11Ø ELSE IF IN$ = CHR$(8)
THEN 9Ø ELSE IF IN$ = CHR$(32) THEN GOSUB 15Ø
7Ø AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
8Ø NEXT : RETURN
9Ø IF T < = 1 THEN 6Ø ELSE T = T - 1
1ØØ AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO
6Ø
11Ø IF FL = Ø THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
12Ø BL$ = STRING$ (LN - LEN(AD$),"Ø") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
13Ø IN$ = "" : IN$ = INKEY$ : GOSUB 14Ø : IF IN$ = "" THEN 13Ø E
LSE RETURN
14Ø PRINT @PA,AD$;CHR$(143);: RETURN
15Ø IF FL = Ø THEN RETURN
16Ø IN$ = "Ø" : RETURN
17Ø T = 1
18Ø IF T > 5 THEN AD$ = "    Ø" : RETURN
19Ø IF MID$(AD$,T,1) = "Ø" THEN T = T + 1 : GOTO 18Ø
2ØØ AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
21Ø PRINT @16Ø, CHR$(31); : RETURN
22Ø CHAIN "MODULEØ/BAS",25Ø,ALL
23Ø PRINT @19Ø,"KEYBOARD INPUT"
24Ø PRINT @32Ø,Z7$;"     **/**/**"; : PRINT @4ØØ,"REF NO. ****";
: PRINT @48Ø,"DETAILS *******************************"; : PRINT
@56Ø,"PREFIX  **"; : PRINT @64Ø,"ACC NO. ***"; : PRINT @72Ø,Z6$;
"  *****.**";
25Ø PRINT @24Ø,"RECORD NO. ";I;
26Ø PRINT @8ØØ,Z5$;" *****.**"; : PRINT @88Ø,"CORRECT (Y/N) *";
: RETURN
27Ø GOSUB 21Ø : GOSUB 23Ø
28Ø FL = 1 : PA = 328 : LN = 2 : GOSUB 4Ø : DT$ = AD$ : IF DT$ =
 "ØØ" THEN RETURN
29Ø GOSUB 3ØØ : GOSUB 31Ø : GOSUB 32Ø : GOSUB 33Ø : GOSUB 34Ø :
FL = 1 : GOSUB 35Ø : GOSUB 36Ø : GOSUB 37Ø : GOSUB 38Ø : FL = Ø
: GOTO 39Ø
3ØØ PA = 331 : GOSUB 4Ø : DT$ = DT$ + AD$ : PA = 334 : GOSUB 4Ø
: DT$ = DT$ + AD$ : RETURN
31Ø PA = 4Ø8 : LN = 4 : FL = Ø : GOSUB 4Ø : RF$ = AD$ : RETURN
32Ø PA = 488 : LN = 31 : GOSUB 4Ø : DE$ = AD$ : RETURN
33Ø PA = 568 : LN = 2 : GOSUB 4Ø : PR$ = AD$ : RETURN
34Ø PA = 648 : LN = 3 : GOSUB 4Ø : PR$ = PR$ + AD$ : RETURN
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350 PA = 727 : LN = 5 : GOSUB 40 : GOSUB 170 : DB$ = AD$ + "." :
 RETURN
360 PA = 733 : LN = 2 : GOSUB 40 : DB$ = DB$ + AD$ : RETURN
370 PA = 807 : LN = 5 : GOSUB 40 : GOSUB 170 : CR$ = AD$ + "." :
 RETURN
380 PA = 813 : LN = 2 : GOSUB 40 : CR$ = CR$ + AD$ : FL = 0 : RE
TURN
390 PA = 894 : LN = 1 : GOSUB 40 : IF AD$ = "N" THEN 270 ELSE IF
 AD$ < > "Y" THEN 390
400 A$(I) = DT$ + RF$ + DE$ + PR$ + DB$ + CR$ : RETURN
410 FOR I = W TO VV : GOSUB 270 : IF DT$ = "00" THEN W = I : GOT
O 220
420 NEXT I : GOTO 220


10 REM                          MODULE2/BAS
20 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5$
,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P
30 GOTO 230
40 AD$ = ""
50 FOR T = 1 TO LN
60 GOSUB 130 : IF IN$ = CHR$(13) THEN 110 ELSE IF IN$ = CHR$(8)
THEN 90 ELSE IF IN$ = CHR$(32) THEN GOSUB 150
70 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
80 NEXT : RETURN
90 IF T < = 1 THEN 60 ELSE T = T - 1
100 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO
60
110 IF FL = 0 THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
120 BL$ = STRING$ (LN - LEN(AD$),"0") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
130 IN$ = "" : IN$ = INKEY$ : GOSUB 140 : IF IN$ = "" THEN 130 E
LSE RETURN
140 PRINT @PA,AD$;CHR$(143);: RETURN
150 IF FL = 0 THEN RETURN
160 IN$ = "0" : RETURN
170 T = 1
180 IF T > 5 THEN AD$ = "     0" : RETURN
190 IF MID$(AD$,T,1) = "0" THEN T = T + 1 : GOTO 180
200 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
210 CLS : PRINT @0,"***                  Household Accounting   Ver
5.0  for the Model 4               ***"; : PRINT @80,"***         (
C)  1st November 1983       M i c r o - 8 0    P t y  L t d
 ***";
220 PRINT @160, CHR$(31); : RETURN
230 X1$ = "LOAD FROM" : GOSUB 310
240 GOSUB 330
250 IF SF = 2 THEN 360
260 GOSUB 340
270 GOSUB 350 : IF AD$ = "E" THEN 230
280 IF SF = 1 THEN OPEN "I",1,NM$
290 IF SF = 1 THEN INPUT #1,W : FOR I = 1 TO W : INPUT #1,A$(I)
 : NEXT : CLOSE
300 GOTO 230
310 GOSUB 220 : PRINT @190,"DATA "; LEFT$(X1$,4);"
320 PRINT:PRINT"                        1 = ";X1$;" DISK":PRINT
:PRINT"                         2 = EXIT TO MENU" : RETURN
330 PRINT @832,Z3$; : PA = 848 : LN = 1 : GOSUB 40 : SF = VAL(AD
$) : IF SF < 1 OR SF > 3 THEN 330 ELSE RETURN
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```
340 FL = 0 : GOSUB 220 : PRINT @428,"ENTER FILENAME ********"; :
 PA = 443 : LN = 8 : GOSUB 40 : NM$ = AD$ : RETURN
350 PRINT @492,"PRESS ANY KEY WHEN DEVICE READY OR (E)SCAPE   *"
; : PA = 538 : LN = 1 : GOSUB 40 : RETURN
360 CHAIN "MODULE0/BAS",250,ALL


10 REM                          MODULE3/BAS
20 GOTO 220
30 AD$ = ""
40 FOR T = 1 TO LN
50 GOSUB 120 : IF IN$ = CHR$(13) THEN 100 ELSE IF IN$ = CHR$(8)
THEN 80 ELSE IF IN$ = CHR$(32) THEN GOSUB 140
60 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
70 NEXT : RETURN
80 IF T < = 1 THEN 50 ELSE T = T - 1
90 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO 5
0
100 IF FL = 0 THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
110 BL$ = STRING$ (LN - LEN(AD$),"0") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
120 IN$ = "" : IN$ = INKEY$ : GOSUB 130 : IF IN$ = "" THEN 120 E
LSE RETURN
130 PRINT @PA,AD$;CHR$(143);: RETURN
140 IF FL = 0 THEN RETURN
150 IN$ = "0" : RETURN
160 T = 1
170 IF T > 5 THEN AD$ = "     0" : RETURN
180 IF MID$(AD$,T,1) = "0" THEN T = T + 1 : GOTO 170
190 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
200 CLS : PRINT @0,"***                  Household Accounting   Ver
5.0  for the Model 4               ***"; : PRINT @80,"***         (
C)  1st November 1983       M i c r o - 8 0    P t y  L t d
 ***";
210 PRINT @160, CHR$(31); : RETURN
220 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5
$,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P
230 GOSUB 210 : GOSUB 240 : GOSUB 280 : GOTO 340
240 PRINT @190,"Contents of ";Z1$;
250 PRINT @240,Z7$;"      REF    DETAILS                          A
CC NO      ";Z6$;"       ";Z5$
260 IF P THEN LPRINT Z7$;"      REF    DETAILS
    ACC NO      ";Z6$;"       ";Z5$
270 RETURN
280 L = 1 : FOR I = 1 TO W - 1
290 GOSUB 330 : GOSUB 350 : PRINT VX$
300 L = L + 1 : IF L = 20 THEN L = 1 : PRINT @1840,SO$; : PA = 1
866 : LN = 1 : GOSUB 30 : GOSUB 210 : GOSUB 240
310 NEXT I
320 PRINT @1840,"END OF DATA - ";SO$; : PA = 1880 : LN = 1 : GOS
UB 30 : RETURN
330 V1$ = LEFT$(A$(I),2) : V2$ = MID$(A$(I),3,2) : V3$ = MID$(A$
(I),5,2) : V4$ = MID$(A$(I),7,4) : V5$ = MID$(A$(I),11,31) : V6$
 = MID$(A$(I),42,2) : V7$ = MID$(A$(I),44,3) : V8$ = MID$(A$(I),
47,8) : V9$ = MID$(A$(I),55,8) : RETURN
340 CHAIN "MODULE0/BAS",250,ALL
350 VX$ = V1$ + "/" + V2$ + "/" + V3$ + " " + V4$ + "  " + V5$ +
 "  " + V6$ + V7$ + "   " + V8$ + "    " + V9$ : RETURN
```

```
10 REM                    MODULE4/BAS
20 GOTO 220
30 AD$ = ""
40 FOR T = 1 TO LN
50 GOSUB 120 : IF IN$ = CHR$(13) THEN 100 ELSE IF IN$ = CHR$(8)
THEN 80 ELSE IF IN$ = CHR$(32) THEN GOSUB 140
60 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
70 NEXT : RETURN
80 IF T < = 1 THEN 50 ELSE T = T - 1
90 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO 5
0
100 IF FL = 0 THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
110 BL$ = STRING$ (LN - LEN(AD$),"0") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
120 IN$ = "" : IN$ = INKEY$ : GOSUB 130 : IF IN$ = "" THEN 120 E
LSE RETURN
130 PRINT @PA,AD$;CHR$(143);: RETURN
140 IF FL = 0 THEN RETURN
150 IN$ = "0" : RETURN
160 T = 1
170 IF T > 5 THEN AD$ = "     0" : RETURN
180 IF MID$(AD$,T,1) = "0" THEN T = T + 1 : GOTO 170
190 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
200 CLS : PRINT @0,"***                   Household Accounting   Ver
5.0  for the Model 4                  ***"; : PRINT @80,"***          (
C)  1st November 1983       M i c r o - 8 0   P t y  L t d
 ***";
210 PRINT @160, CHR$(31); : RETURN
220 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5
$,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P:GOTO 360
230 PRINT @320,Z7$;"     **/**/**"; : PRINT @400,"REF NO. ****";
: PRINT @480,"DETAILS *******************************"; : PRINT
@560,"PREFIX  **"; : PRINT @640,"ACC NO. ***"; : PRINT @720,Z6$;
"  *****.**";
240 PRINT @240,"RECORD NO. ";I;
250 PRINT @800,Z5$;" *****.**"; : RETURN
260 PA = 331 : GOSUB 30 : DT$ = DT$ + AD$ : PA = 334 : GOSUB 30
: DT$ = DT$ + AD$ : RETURN
270 PA = 408 : LN = 4 : FL = 0 : GOSUB 30 : RF$ = AD$ : RETURN
280 PA = 488 : LN = 31 : GOSUB 30 : DE$ = AD$ : RETURN
290 PA = 568 : LN = 2 : GOSUB 30 : PR$ = AD$ : RETURN
300 PA = 648 : LN = 3 : GOSUB 30 : PR$ = PR$ + AD$ : RETURN
310 PA = 727 : LN = 5 : GOSUB 30 : GOSUB 160 : DB$ = AD$ + "." :
 RETURN
320 PA = 733 : LN = 2 : GOSUB 30 : DB$ = DB$ + AD$ : RETURN
330 PA = 807 : LN = 5 : GOSUB 30 : GOSUB 160 : CR$ = AD$ + "." :
 RETURN
340 PA = 813 : LN = 2 : GOSUB 30 : CR$ = CR$ + AD$ : FL = 0 : RE
TURN
350 A$(I) = DT$ + RF$ + DE$ + PR$ + DB$ + CR$ : RETURN
360 I = 1 : FL = 0
370 PRINT @213,"EDIT ";Z1$;
380 GOSUB 210 : GOSUB 230 : PRINT @832,"                  "; : PRIN
T @960,"SELECT *";
390 PRINT @240,"RECORD NO. ";I;
400 GOSUB 640
410 IF V1$ = "" THEN GOSUB 230 : PRINT @832,"                   ";
420 PRINT @328,V1$; : PRINT @331,V2$; : PRINT @334,V3$; : PRINT
@408,V4$; : PRINT @488,V5$; : PRINT @568,V6$; : PRINT @648,V7$;
: PRINT @727,V8$; : PRINT @807,V9$;
430 PA = 967 : LN = 1 : GOSUB 30 : IF AD$ = ";" THEN PRINT @960,
"ADVANCE"; : I = I + 1 : IF I > VV THEN I = VV
440 IF AD$ = "+" THEN PRINT @960,"ADVANCE"; : I = I + 10 : IF I
> VV THEN I = VV
450 IF AD$ = "-" THEN I = I - 1 : PRINT @960,"REVERSE"; : IF I <
 = 0 THEN I = 1
460 IF AD$ = "=" THEN I = I - 10 : PRINT @960,"REVERSE"; : IF I
< = 0 THEN I = 1
470 IF AD$ = " " THEN 650
480 IF AD$ = "E" THEN PRINT @960,"* EDIT *"; : GOSUB 500 : GOTO
380
490 GOTO 390
500 FL = 1 : PA = 328 : LN = 2 : GOSUB 30 : IF AD$ = "00" THEN D
T$ = V1$ + V2$ + V3$ : PRINT @328,V1$;"/";V2$;"/";V3$; : GOTO 52
0
510 DT$ = AD$ : GOSUB 260
520 GOSUB 270 : IF RF$ = "    " THEN RF$ = V4$ : PRINT @408,RF$;
530 GOSUB 280 : IF DE$ = "                               " THEN
DE$ = V5$ : PRINT @488,DE$;
540 GOSUB 290 : IF PR$ = "  " THEN P1$ = V6$ : PRINT @568,V6$; :
 GOTO 560
550 P1$ = AD$
560 GOSUB 300 : IF AD$ = "   " THEN PR$ = P1$ + V7$ : PRINT @648
,V7$; : GOTO 580
570 PR$ = P1$ + AD$
580 FL = 0 : GOSUB 310 : IF AD$ = "     " THEN DB$ = V8$ : PRINT
 @727,V8$; : GOTO 600
590 GOSUB 160 : GOSUB 320
600 FL = 0 : GOSUB 330 : IF AD$ = "     " THEN CR$ = V9$ : PRINT
 @807,V9$; : GOTO 620
610 GOSUB 160 : GOSUB 340
620 GOSUB 350
630 FL = 0 : RETURN
640 V1$ = LEFT$(A$(I),2) : V2$ = MID$(A$(I),3,2) : V3$ = MID$(A$
(I),5,2) : V4$ = MID$(A$(I),7,4) : V5$ = MID$(A$(I),11,31) : V6$
 = MID$(A$(I),42,2) : V7$ = MID$(A$(I),44,3) : V8$ = MID$(A$(I),
47,8) : V9$ = MID$(A$(I),55,8) : RETURN
650 CHAIN "MODULE0/BAS",250,ALL
```

```
10 REM                    MODULE5/BAS
20 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5$
,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P
30 GOTO 230
40 AD$ = ""
50 FOR T = 1 TO LN
60 GOSUB 130 : IF IN$ = CHR$(13) THEN 110 ELSE IF IN$ = CHR$(8)
THEN 90 ELSE IF IN$ = CHR$(32) THEN GOSUB 150
70 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
80 NEXT : RETURN
90 IF T < = 1 THEN 60 ELSE T = T - 1
100 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO
60
110 IF FL = 0 THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
120 BL$ = STRING$ (LN - LEN(AD$),"0") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
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130 IN$ = "" : IN$ = INKEY$ : GOSUB 140 : IF IN$ = "" THEN 130 E
LSE RETURN
140 PRINT @PA,AD$;CHR$(143);: RETURN
150 IF FL = Ø THEN RETURN
160 IN$ = "Ø" : RETURN
170 T = 1
180 IF T > 5 THEN AD$ = "    Ø" : RETURN
190 IF MID$(AD$,T,1) = "Ø" THEN T = T + 1 : GOTO 180
200 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
210 CLS : PRINT @Ø,"***                Household Accounting   Ver
5.Ø  for the Model 4              ***"; : PRINT @8Ø,"***          (
C)  1st November 1983      M i c r o - 8 Ø   P t y  L t d
 ***";
220 PRINT @16Ø, CHR$(31); : RETURN
230 X1$ = "SAVE TO" : GOSUB 31Ø
240 GOSUB 33Ø
250 IF SF = 2 THEN 36Ø
260 GOSUB 34Ø
270 GOSUB 35Ø : IF AD$ = "E" THEN 23Ø
280 IF SF = 1 THEN OPEN "O",1,NM$
290 IF SF = 1 THEN PRINT #1,W : FOR I = 1 TO W : PRINT #1,A$(I)
: NEXT : CLOSE
300 GOTO 23Ø
310 GOSUB 22Ø : PRINT @19Ø,"DATA "; LEFT$(X1$,4);"
320 PRINT:PRINT"                        1 = ";X1$;" DISK":PRINT
:PRINT"                        2 = EXIT TO MENU" : RETURN
330 PRINT @832,Z3$; : PA = 848 : LN = 1 : GOSUB 4Ø : SF = VAL(AD
$) : IF SF < 1 OR SF > 3 THEN 33Ø ELSE RETURN
340 FL = Ø : GOSUB 22Ø : PRINT @428,"ENTER FILENAME ********"; :
 PA = 443 : LN = 8 : GOSUB 4Ø : NM$ = AD$ : RETURN
350 PRINT @492,"PRESS ANY KEY WHEN DEVICE READY OR (E)SCAPE    *"
; : PA = 538 : LN = 1 : GOSUB 4Ø : RETURN
360 CHAIN "MODULEØ/BAS",25Ø,ALL


10 REM                    MODULE6/BAS
20 GOTO 22Ø
30 AD$ = ""
40 FOR T = 1 TO LN
50 GOSUB 12Ø : IF IN$ = CHR$(13) THEN 1ØØ ELSE IF IN$ = CHR$(8)
THEN 8Ø ELSE IF IN$ = CHR$(32) THEN GOSUB 14Ø
60 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
70 NEXT : RETURN
80 IF T < = 1 THEN 5Ø ELSE T = T - 1
90 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO 5
Ø
100 IF FL = Ø THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
110 BL$ = STRING$ (LN - LEN(AD$),"Ø") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
120 IN$ = "" : IN$ = INKEY$ : GOSUB 13Ø : IF IN$ = "" THEN 12Ø E
LSE RETURN
130 PRINT @PA,AD$;CHR$(143);: RETURN
140 IF FL = Ø THEN RETURN
150 IN$ = "Ø" : RETURN
160 T = 1
170 IF T > 5 THEN AD$ = "    Ø" : RETURN
180 IF MID$(AD$,T,1) = "Ø" THEN T = T + 1 : GOTO 17Ø
190 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
200 CLS : PRINT @Ø,"***                Household Accounting   Ver
5.Ø  for the Model 4              ***"; : PRINT @8Ø,"***          (
C)  1st November 1983      M i c r o - 8 Ø   P t y  L t d
 ***";
210 PRINT @16Ø, CHR$(31); : RETURN
220 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,SO$,ZØ$,Z1$,Z2$,Z3$,Z4$,Z5
$,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P:GOTO 26Ø
230 PRINT @32Ø,Z7$;"       REF    DETAILS                        A
CC NO      ";Z6$;"       ";Z5$
240 IF P THEN LPRINT Z7$;"       REF    DETAILS
   ACC NO      ";Z6$;"       ";Z5$
250 RETURN
260 GOSUB 2ØØ : PRINT @19Ø,Z4$;"s Available":PRINT:PRINT"1 = Pri
nt Ledger Balances               :  4 = GJ General ";Z4$:PRINT"2 =
 CP Cash Payments ";Z4$;"           :  5 = SJ Sales ";Z4$:PRINT"3
 = CR Cash Received ";Z4$"           :";
270 PRINT"  6 = Return To Main Menu"
280 PRINT @832,Z3$; : PA = 848 : LN = 1 : GOSUB 3Ø : AD = VAL(AD
$)
290 IF AD < 1 OR AD > 6 THEN 28Ø
300 ON AD GOTO 56Ø,31Ø,32Ø,33Ø,34Ø,53Ø
310 PT$ = "CASH PAYMENTS" : KA$ = "CP" : GOTO 35Ø
320 PT$ = "CASH RECEIVED" : KA$ = "CR" : GOTO 35Ø
330 PT$ = "GENERAL" : KA$ = "GJ" : GOTO 35Ø
340 PT$ = "SALES" : KA$ = "SJ"
350 GOSUB 36Ø : GOSUB 39Ø : GOTO 41Ø
360 PRINT @832,"IS THE PRINTER REQUIRED (Y/N) *"; : PA = 862 : L
N = 1 : GOSUB 3Ø
370 IF AD$ < > "N" AND AD$ < > "Y" THEN 36Ø
380 P = (AD$ = "Y") : RETURN
390 ZK$ = "" : PRINT @896,"WHICH ";Z7$;" DO YOU REQUIRE **/**/**
"; : FL = 1 : PA = 922 : LN = 2 : GOSUB 3Ø : E$ = AD$ : IF E$ =
"ØØ" THEN E$ = "'S" : ZK$ = "ALL " : GOTO 41Ø
400 PA = 925 : GOSUB 3Ø : E$ = E$ + AD$ : PA = 928 : GOSUB 3Ø :
E$ = E$ + AD$ : RETURN
410 GOSUB 21Ø : PRINT : PRINT PT$;" ";Z4$;" FOR ";ZK$;"(";Z7$;")
";E$ : IF P THEN LPRINT : LPRINT PT$;" ";Z4$;" FOR ";ZK$;"(";Z7$
;")";E$
420 DT# = Ø : CT# = Ø : BL# = Ø : GOSUB 23Ø
430 FOR I = 1 TO W
440 IF MID$(A$(I),42,2) < > KA$ THEN 49Ø
450 IF E$ = "'S" THEN 47Ø
460 IF E$ < > LEFT$(A$(I),6) THEN 49Ø
470 GOSUB 54Ø : GOSUB 55Ø : PRINT VX$ : IF P THEN LPRINT VX$
480 DR# = VAL( MID$(A$(I),47,8)) : CR# = VAL( MID$(A$(I),55,8))
: DT# = DT# + DR# : CT# = CT# + CR# : BL# = BL# + DR# - CR#
490 NEXT
500 PRINT : PRINT ZØ$; TAB(36); : PRINT USING F3$;DT#;CT# : PRIN
T "BALANCE "; : PRINT USING F4$;BL#
510 IF P THEN LPRINT : LPRINT ZØ$; TAB(36); : LPRINT USING F3$;D
T#;CT# : LPRINT "BALANCE "; : LPRINT USING F4$;BL#
520 PRINT @96Ø,"PRINTOUT COMPLETE - ";SO$; : PA = 1ØØ6 : LN = 1
: GOSUB 3Ø : GOTO 26Ø
530 CHAIN "MODULEØ/BAS",25Ø,ALL
540 V1$ = LEFT$(A$(I),2) : V2$ = MID$(A$(I),3,2) : V3$ = MID$(A$
(I),5,2) : V4$ = MID$(A$(I),7,4) : V5$ = MID$(A$(I),11,31) : V6$
 = MID$(A$(I),42,2) : V7$ = MID$(A$(I),44,3) : V8$ = MID$(A$(I),
47,8) : V9$ = MID$(A$(I),55,8) : RETURN
550 VX$ = V1$ + "/" + V2$ + "/" + V3$ + " " + V4$ + "  " + V5$ +
 "  " + V6$ + V7$ + "   " + V8$ + "    " + V9$ : RETURN
```

```
560 GOSUB 200 : GOSUB 360 : GOSUB 200 : GOSUB 710 : PRINT @463,"
* * *  W A I T  * * *" : FOR I = 1 TO W - 1 : GOSUB 540 : LB(I)
= VAL( RIGHT$(V7$,3)) : NEXT I : J = 0 : DT# = 0 : CT# = 0 : BL#
 = 0
570 GOSUB 210 : PRINT : PRINT "ACC NO."; TAB(16);Z6$;"S"; TAB(34
);Z5$;"S"; TAB(55);Z0$
580 IF P THEN LPRINT : LPRINT "ACC NO."; TAB(16);Z6$;"S"; TAB(34
);Z5$;"S"; TAB(55);Z0$
590 TT# = 0 : DR# = 0 : CR# = 0 : J = J + 1
600 VF = LB(J) : FOR I = 1 TO W : IF LB(I) = VF AND LB(I) < > 0
THEN GOSUB 700
610 NEXT I : LB(J) = 0 : IF J = W THEN 670 ELSE 620
620 IF VF = 0 THEN 590
630 TT# = DR# - CR# : DT# = DT# + DR# : CT# = CT# + CR# : BL# =
BL# + TT#
640 PRINT "  "; MID$(A$(J),44,3); : PRINT USING F5$;DR#;CR#;TT#
650 IF P THEN LPRINT "  "; MID$(A$(J),44,3); : LPRINT USING F5$;
DR#;CR#;TT#
660 GOTO 590
670 PRINT : PRINT Z0$; : PRINT USING F5$;DT#;CT#;BL#
680 IF P THEN LPRINT : LPRINT Z0$; : LPRINT USING F5$;DT#;CT#;BL
#
690 PRINT @1840,S0$; : PA = 1866 : LN = 1 : GOSUB 30 : GOTO 530
700 GOSUB 540 : DR# = DR# + VAL(V8$) : CR# = CR# + VAL(V9$) : LB
(I) = 0 : RETURN
710 PRINT @463,"* * *  SORTING  * * *" : FOR SC = 1 TO W - 1 : F
OR SA = 1 TO W - 1
720 SA$ = MID$(A$(SA),28,3)
730 SB$ = MID$(A$(SA + 1),28,3) : IF SB$ = "" THEN GOTO 740 ELSE
 IF SA$ > SB$ THEN SB$ = A$(SA) : A$(SA) = A$(SA + 1) : A$(SA +
1) = SB$
740 NEXT SA : NEXT SC : RETURN
```

```
10 REM                    MODULE7/BAS
20 ON ERROR GOTO 100
30 GOTO 50
40 PRINT @160, CHR$(31); : RETURN
50 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,S0$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5$
,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P
60 GOSUB 40 : PRINT @190,"LINEPRINTER UTILITY":PRINT:PRINT"TYPE
HEADINGS OR NOTES AS REQUIRED":PRINT:PRINT"TYPE "; CHR$(34);"EXI
T"; CHR$(34);" TO RETURN TO MAIN MENU":PRINT CHR$(14)
70 M$ = "" : INPUT M$ : IF M$ = "EXIT" THEN PRINT CHR$(15):GOTO
90
80 PRINT M$ : LPRINT M$ : GOTO 70
90 CHAIN "MODULE0/BAS",250,ALL
100 IF ERR = 57 THEN PRINT"Device I/O error":PRINT"PLEASE CONNEC
T PRINTER OR TYPE EXIT":PRINT:RESUME 70
```

```
10 REM                    MODULE8/BAS
20 GOTO 220
30 AD$ = ""
40 FOR T = 1 TO LN
50 GOSUB 120 : IF IN$ = CHR$(13) THEN 100 ELSE IF IN$ = CHR$(8)
THEN 80 ELSE IF IN$ = CHR$(32) THEN GOSUB 140
60 AD$ = AD$ + IN$ : PRINT @PA,AD$; : NEXT : RETURN
70 NEXT : RETURN
80 IF T < = 1 THEN 50 ELSE T = T - 1
90 AD$ = LEFT$(AD$, LEN(AD$) - 1) : PRINT @PA,AD$;"**"; : GOTO 5
0
100 IF FL = 0 THEN BL$ = STRING$ (LN - LEN(AD$)," ") : AD$ = AD$
 + BL$ : PRINT @PA,AD$; : RETURN
110 BL$ = STRING$ (LN - LEN(AD$),"0") : AD$ = AD$ + BL$ : PRINT
@PA,AD$; : RETURN
120 IN$ = "" : IN$ = INKEY$ : GOSUB 130 : IF IN$ = "" THEN 120 E
LSE RETURN
130 PRINT @PA,AD$;CHR$(143);: RETURN
140 IF FL = 0 THEN RETURN
150 IN$ = "0" : RETURN
160 T = 1
170 IF T > 5 THEN AD$ = "     0" : RETURN
180 IF MID$(AD$,T,1) = "0" THEN T = T + 1 : GOTO 170
190 AD$ = STRING$ (T - 1,32) + RIGHT$(AD$,6 - T) : RETURN
200 CLS : PRINT @0,"***                    Household Accounting   Ver
5.0  for the Model 4                ***"; : PRINT @80,"***           (
C)  1st November 1983       M i c r o - 8 0   P t y  L t d
 ***";
210 PRINT @160, CHR$(31); : RETURN
220 COMMON VV,A$(),LB(),F3$,F4$,F5$,W,S0$,Z0$,Z1$,Z2$,Z3$,Z4$,Z5
$,Z6$,Z7$,PA,LN,AD,AD$,DT$,RF$,DE$,PR$,DB$,CR$,P:GOTO 290
230 PRINT @320,Z7$;"      REF    DETAILS                          A
CC NO      ";Z6$;"       ";Z5$
240 IF P THEN LPRINT Z7$;"      REF    DETAILS
   ACC NO      ";Z6$;"       ";Z5$
250 RETURN
260 PRINT @832,"IS THE PRINTER REQUIRED (Y/N) *"; : PA = 862 : L
N = 1 : GOSUB 30
270 IF AD$ < > "N" AND AD$ < > "Y" THEN 260
280 P = (AD$ = "Y") : RETURN
290 GOSUB 210 : PRINT @190,"Ledger ";Z2$;"s":PRINT:PRINT"Type ";
 CHR$(34);"999"; CHR$(34);" To Exit"
300 GOSUB 260
310 PRINT @960,"Which ";Z2$;" No. Do You Require ***"; : PA = 99
3 : LN = 3 : FL = 1 : GOSUB 30 : N = VAL(AD$)
320 IF N < 1 OR N > 999 THEN 310
330 BL# = 0 : DT# = 0 : CT# = 0 : IF N = 999 THEN 480
340 GOSUB 200 : PRINT : PRINT Z2$;" NO. ";AD$; : IF P THEN LPRIN
T : LPRINT Z2$;" NO. ";AD$
350 GOSUB 230 : FOR I = 1 TO W
360 IF N < > VAL( MID$(A$(I),28,3)) THEN 390
370 GOSUB 460 : GOSUB 470 : PRINT VX$ : IF P THEN LPRINT VX$
380 DR# = VAL( MID$(A$(I),47,8)) : CR# = VAL( MID$(A$(I),55,8))
 : DT# = DT# + DR# : CT# = CT# + CR# : BL# = BL# + DR# - CR#
390 NEXT
400 PRINT : PRINT Z0$; TAB(36); : PRINT USING F3$;DT#;CT#
410 IF P THEN LPRINT : LPRINT Z0$; TAB(36); : LPRINT USING F3$;D
T#;CT#
420 PRINT Z2$;" BALANCE"; : PRINT USING F4$;BL#
430 IF P THEN LPRINT Z2$;" BALANCE"; : LPRINT USING F4$;BL#
440 PRINT : PRINT : IF P THEN LPRINT " " : LPRINT " "
450 GOTO 310
460 V1$ = LEFT$(A$(I),2) : V2$ = MID$(A$(I),3,2) : V3$ = MID$(A$
(I),5,2) : V4$ = MID$(A$(I),7,4) : V5$ = MID$(A$(I),11,31) : V6$
 = MID$(A$(I),42,2) : V7$ = MID$(A$(I),44,3) : V8$ = MID$(A$(I),
47,8) : V9$ = MID$(A$(I),55,8) : RETURN
470 VX$ = V1$ + "/" + V2$ + "/" + V3$ + " " + V4$ + "  " + V5$ +
 "  " + V6$ + V7$ + "   " + V8$ + "    " + V9$ : RETURN
480 CHAIN "MODULE0/BAS",250,ALL
```

```
ØØØ1Ø **************************
ØØØ2Ø *      WRITER 1.1          *
ØØØ3Ø *(C) 1983 G.D. WILLIAMSON*
ØØØ4Ø **************************
ØØØ5Ø *
ØØØ6Ø *
ØØØ7Ø *This program is in two parts
ØØØ8Ø *
ØØØ9Ø *This is the loader
ØØ1ØØ *
ØØ11Ø *
ØØ12Ø SCRST   EQU     $BA     Basic's pointer to screen start
ØØ13Ø ENDBAS  EQU     $1B     End of Basic program pointer
ØØ14Ø         ORG     Ø
ØØ15Ø START   LDX     <ENDBAS Get end of Basic pointer
ØØ16Ø         TFR     X,U     Keep it in U
ØØ17Ø         LEAX    $4CD,X  Length of our program
ØØ18Ø         STX     <ENDBAS Redirect end of program pointer
ØØ19Ø         LEAX    BEGIN,PCR       Point to start of program
ØØ2ØØ         LDY     #$4CD   Counter
ØØ21Ø LOOP    LDA     ,X+     Get byte
ØØ22Ø         STA     ,U+     Reposition it
ØØ23Ø         LEAY    -1,Y    Counter down
ØØ24Ø         BNE     LOOP    ?Go again
ØØ25Ø         LDA     #$39    RTS code
ØØ26Ø         STA     START,PCR       Do not allow to be exec'd again
ØØ27Ø         RTS             Back to Basic
ØØ28Ø *
ØØ29Ø *
ØØ3ØØ *This is the entry point for USRØ
ØØ31Ø *
ØØ32Ø *
ØØ33Ø BEGIN   PSHS    CC,X    Save them
ØØ34Ø         ORCC    #$5Ø    Disable interrupts
ØØ35Ø         TST     <FLAG,PCR       ?already set
ØØ36Ø         BNE     BACK1   If set, exit
ØØ37Ø         INC     <FLAG,PCR       If not, set it
ØØ38Ø         LDX     $168    Get Basic's return address
ØØ39Ø         STX     1+RET1,PCR      And save it
ØØ4ØØ         LEAX    <CHROUT,PCR     Point to our routine
ØØ41Ø BACK    STX     $168    Direct Basic to our patch
ØØ42Ø BACK1   ANDCC   #$AF    Enable interrupts
ØØ43Ø         PULS    X,CC,PC Back to Basic
ØØ44Ø *
ØØ45Ø *
ØØ46Ø *This is the entry point for USR1
ØØ47Ø *
ØØ48Ø *
ØØ49Ø         PSHS    X,CC    Save them
ØØ5ØØ         ORCC    #$5Ø    Disable interrupts
ØØ51Ø         TST     <FLAG,PCR       ? set
ØØ52Ø         BEQ     BACK1   Back if so
ØØ53Ø         CLR     <FLAG,PCR       If not, clear it
ØØ54Ø RET1    LDX     #$1111  Dummy address - see line 39Ø
ØØ55Ø         BRA     BACK    Reset RAM hook for Basic
ØØ56Ø *
ØØ57Ø *
ØØ58Ø *Start of our main routine
ØØ59Ø *
ØØ6ØØ *
ØØ61Ø CHROUT  PSHS    U,D,X,Y,CC      Save all
ØØ62Ø         CMPA    #8      ?Backspace
ØØ63Ø         BNE     CRTRNG  If not look for more controls
ØØ64Ø         LDA     #$2Ø    ASCII for space
ØØ65Ø         BSR     DSPLY   Go show it
ØØ66Ø         LEAX    -1,X    Back one pos
ØØ67Ø         BSR     SHOW    Rub out charac
ØØ68Ø         BRA     STOP    Exit
ØØ69Ø CRTRNG  CMPA    #$2Ø    ?Control charac
ØØ7ØØ         BLO     STOP    Exit if so
ØØ71Ø         CMPA    #$7F    ?Graphics charac
ØØ72Ø         BHI     STOP    Exit if so
ØØ73Ø         BSR     DSPLY   Go show it
ØØ74Ø         BSR     SHOW
ØØ75Ø         BRA     STOP    Exit
```

```
ØØ76Ø DSPLY   PSHS    A         Save charac
ØØ77Ø         LDD     <$88      Basic's cursor pos
ØØ78Ø         PSHS    B         Save LSB
ØØ79Ø         LSRA              MSB of A into carry bit
ØØ8ØØ         RORB              And into MSBit of B
ØØ81Ø         LSRB              Shift into lower nybble
ØØ82Ø         LSRB
ØØ83Ø         LSRB
ØØ84Ø         LSRB
ØØ85Ø         LDA     #$ØC      12 bytes/charac
ØØ86Ø         MUL               Modify position
ØØ87Ø         LDA     #$2Ø      32 bytes/row
ØØ88Ø         MUL               Get row position
ØØ89Ø         TFR     D,X       Swap for later
ØØ9ØØ         PULS    B         Retrieve it
ØØ91Ø         ANDB    #$1F      Clear bits 5-7
ØØ92Ø         ABX               Get column position
ØØ93Ø         LDD     <SCRST    Get screen start
ØØ94Ø         LEAX    D,X       Get position on screen
ØØ95Ø         PULS    A         Retrieve charac
ØØ96Ø         RTS
ØØ97Ø SHOW    SUBA    #$2Ø      Adjust for table
ØØ98Ø         LDB     #$ØC      12 bytes/charac
ØØ99Ø         MUL               So modify
Ø1ØØØ         LEAU    TABLE,PCR         Point to start of table
Ø1Ø1Ø         LEAU    D,U       Point to charac
Ø1Ø2Ø         LDB     #$ØC      12 bytes/charac
Ø1Ø3Ø DSPLY1  LDA     ,U+       Get byte from table
Ø1Ø4Ø         STA     ,X        Display it
Ø1Ø5Ø         LEAX    $2Ø,X     Down one row
Ø1Ø6Ø         DECB              Counter down
Ø1Ø7Ø         BNE     DSPLY1    ?Get more
Ø1Ø8Ø         RTS               Back to sender
Ø1Ø9Ø STOP    PULS    U,D,X,Y,CC,PC     Back to Basic
Ø11ØØ *
Ø111Ø *
Ø112Ø FLAG    FCB     Ø         Store to show which USR routine is invoked
Ø113Ø *
Ø114Ø *
Ø115Ø *Start of character table
Ø116Ø TABLE   FCB     Ø         SPACE
Ø117Ø         FCB     Ø
Ø118Ø         FCB     Ø
Ø119Ø         FCB     Ø
Ø12ØØ         FCB     Ø
Ø121Ø         FCB     Ø
Ø122Ø         FCB     Ø
Ø123Ø         FCB     Ø
Ø124Ø         FCB     Ø
Ø125Ø         FCB     Ø
Ø126Ø         FCB     Ø
Ø127Ø         FCB     Ø
Ø128Ø         FCB     Ø         !
Ø129Ø         FCB     8
Ø13ØØ         FCB     8
Ø131Ø         FCB     8
Ø132Ø         FCB     8
Ø133Ø         FCB     8
Ø134Ø         FCB     8
Ø135Ø         FCB     8
Ø136Ø         FCB     Ø
Ø137Ø         FCB     8
Ø138Ø         FCB     Ø
Ø139Ø         FCB     Ø
Ø14ØØ         FCB     Ø         "
Ø141Ø         FCB     $24
Ø142Ø         FCB     $24
Ø143Ø         FCB     Ø
Ø144Ø         FCB     Ø
Ø145Ø         FCB     Ø
Ø146Ø         FCB     Ø
Ø147Ø         FCB     Ø
Ø148Ø         FCB     Ø
Ø149Ø         FCB     Ø
Ø15ØØ         FCB     Ø
```

```
12Ø4Ø         FCB      $7E
12Ø5Ø         FCB      Ø
12Ø6Ø         FCB      Ø
12Ø7Ø         FCB      Ø
12Ø8Ø         FCB      Ø
12Ø9Ø         FCB      Ø
121ØØ         FCB      Ø
1211Ø         END      START
3ØØØ: 9E1B 1F13 3Ø89 Ø4CD 9F1B 3Ø8D ØØ12 1Ø8E
3Ø1Ø: Ø4CD A68Ø A7CØ 313F 26F8 8639 A78C E139
3Ø2Ø: 3411 1A5Ø 6D8C 7F26 1Ø6C 8C7A BEØ1 68AF
3Ø3Ø: 8DØØ 173Ø 8C18 BFØ1 681C AF35 9134 111A
3Ø4Ø: 5Ø6D 8C62 27F3 6F8C 5D8E 1111 2ØE8 3477
3Ø5Ø: 81Ø8 26ØA 862Ø 8D14 3Ø1F 8D3Ø 2Ø46 812Ø
3Ø6Ø: 2542 817F 223E 8DØ4 8D22 2Ø38 34Ø2 DC88
3Ø7Ø: 34Ø4 4456 5454 5454 86ØC 3D86 2Ø3D 1FØ1
3Ø8Ø: 35Ø4 C41F 3ADC BA3Ø 8B35 Ø239 8Ø2Ø C6ØC
3Ø9Ø: 3D33 8DØØ 1233 CBC6 ØCA6 CØA7 843Ø 882Ø
3ØAØ: 5A26 F639 35F7 ØØØØ ØØØØ ØØØØ ØØØØ ØØØØ
3ØBØ: ØØØØ ØØØØ Ø8Ø8 Ø8Ø8 Ø8Ø8 Ø8ØØ Ø8ØØ ØØØØ
3ØCØ: 2424 ØØØØ ØØØØ ØØØØ ØØØØ ØØØØ ØØ24 247E
3ØDØ: 2424 7E24 24ØØ ØØØ8 3E49 281C ØAØ9 493E
3ØEØ: Ø8ØØ ØØØØ 7Ø51 72Ø4 Ø81Ø 2745 Ø7ØØ ØØØC
3ØFØ: 1212 ØC18 2542 4639 ØØØØ ØØØØ 181Ø ØØØØ
31ØØ: ØØØØ ØØØØ ØØØØ ØØØ8 1Ø1Ø 1Ø1Ø 1Ø1Ø 1ØØ8
311Ø: ØØØØ ØØØ8 Ø4Ø4 Ø4Ø4 Ø4Ø4 Ø4Ø8 ØØØØ ØØØØ
312Ø: ØØØØ 4122 147F 1422 41ØØ ØØØØ ØØØØ ØØØ8
313Ø: Ø87F Ø8Ø8 Ø8ØØ ØØØØ ØØØØ ØØØØ ØØØØ ØØ18
314Ø: 18Ø8 1ØØØ ØØØØ ØØØØ 7FØØ ØØØØ ØØØØ ØØØØ
315Ø: ØØØØ ØØØØ ØØØØ 1818 ØØØØ ØØØ1 Ø1Ø2 Ø4Ø8
316Ø: 1Ø2Ø 4Ø4Ø ØØØØ ØØ3E 4143 4549 5161 413E
317Ø: ØØØØ ØØØ8 18Ø8 Ø8Ø8 Ø8Ø8 Ø83E ØØØØ ØØ3E
318Ø: 41Ø1 Ø2Ø4 Ø81Ø 2Ø7F ØØØØ ØØ3E 41Ø1 Ø1ØE
319Ø: Ø1Ø1 413E ØØØØ ØØØ2 Ø6ØA 1222 7FØ2 Ø2Ø2
31AØ: ØØØØ ØØ7F 4Ø4Ø 4Ø7E Ø1Ø1 413E ØØØØ ØØ3E
31BØ: 414Ø 4Ø7E 4141 413E ØØØØ ØØ7F Ø1Ø1 Ø2Ø4
31CØ: Ø81Ø 2Ø2Ø ØØØØ ØØ3E 4141 413E 4141 413E
31DØ: ØØØØ ØØ3E 4141 413F Ø1Ø1 413E ØØØØ ØØØØ
31EØ: ØØØØ ØØ18 18ØØ 1818 ØØØØ ØØØØ ØØØØ ØØ18
31FØ: 18ØØ 1818 Ø81Ø ØØØØ Ø2Ø4 Ø81Ø 2Ø1Ø Ø8Ø4
32ØØ: Ø2ØØ ØØØØ ØØØØ ØØ7F ØØ7F ØØØØ ØØØØ ØØØØ
321Ø: 2Ø1Ø Ø8Ø4 Ø2Ø4 Ø81Ø 2ØØØ ØØ3E 41Ø1 Ø2Ø4
322Ø: Ø8Ø8 ØØØ8 ØØØØ ØØ3E 414Ø 4Ø4E 5151 493E
323Ø: ØØØØ ØØØ8 1422 417F 4141 4141 ØØØØ ØØ7E
324Ø: 2121 213E 2121 217E ØØØØ ØØ3E 414Ø 4Ø4Ø
325Ø: 4Ø4Ø 413E ØØØØ ØØ7E 2121 2121 2121 217E
326Ø: ØØØØ ØØ7F 4Ø4Ø 4Ø7E 4Ø4Ø 4Ø7F ØØØØ ØØ7F
327Ø: 4Ø4Ø 4Ø7E 4Ø4Ø 4Ø4Ø ØØØØ ØØ7F 4Ø4Ø 4341
328Ø: 4141 417F ØØØØ ØØ41 4141 417F 4141 4141
329Ø: ØØØØ ØØ1C Ø8Ø8 Ø8Ø8 Ø8Ø8 Ø81C ØØØØ ØØØ4
32AØ: Ø4Ø4 Ø4Ø4 Ø4Ø4 441C ØØØØ ØØ41 4244 487Ø
32BØ: 4844 4241 ØØØØ ØØ4Ø 4Ø4Ø 4Ø4Ø 4Ø4Ø 4Ø7F
32CØ: ØØØØ ØØ41 6355 4941 4141 4141 ØØØØ ØØ41
32DØ: 4161 5149 4543 4141 ØØØØ ØØ3E 4141 4141
32EØ: 4141 413E ØØØØ ØØ7E 4141 417E 4Ø4Ø 4Ø4Ø
32FØ: ØØØØ ØØ3E 4141 4141 4945 423D ØØØØ ØØ7E
33ØØ: 4141 417E 4844 4241 ØØØØ ØØ3E 414Ø 4Ø3E
331Ø: Ø1Ø1 413E ØØØØ ØØ7F Ø8Ø8 Ø8Ø8 Ø8Ø8 Ø8Ø8
332Ø: ØØØØ ØØ41 4141 4141 4141 413E ØØØØ ØØ41
333Ø: 4141 4141 4122 14Ø8 ØØØØ ØØ41 4141 4141
334Ø: 4955 6341 ØØØØ ØØ41 4122 14Ø8 1422 4141
335Ø: ØØØØ ØØ41 4141 2214 Ø8Ø8 Ø8Ø8 ØØØØ ØØ7F
336Ø: Ø1Ø2 Ø4Ø8 1Ø2Ø 4Ø7F ØØØØ ØØ3C 2Ø2Ø 2Ø2Ø
337Ø: 2Ø2Ø 2Ø3C ØØØØ ØØ4Ø 4Ø2Ø 1ØØ8 Ø4Ø2 Ø1Ø1
338Ø: ØØØØ ØØ3C Ø4Ø4 Ø4Ø4 Ø4Ø4 Ø43C ØØØØ ØØØØ
339Ø: 1C2A 49Ø8 Ø8Ø8 Ø8Ø8 Ø8ØØ ØØØØ ØØØ8 1Ø2Ø
33AØ: 7F2Ø 1ØØ8 ØØØØ ØØØØ ØØØØ ØØØØ ØØØØ ØØØØ
33BØ: ØØØØ ØØØØ ØØØØ 3CØ2 3E42 423C ØØØØ ØØ4Ø
33CØ: 4Ø4Ø 7C42 4242 427C ØØØØ ØØØØ ØØØØ 3C42
33DØ: 4Ø4Ø 423C ØØØØ ØØØ2 Ø2Ø2 3E42 4242 423E
33EØ: ØØØØ ØØØØ ØØØØ 7C44 7C4Ø 4Ø7C ØØØØ ØØØA
33FØ: Ø8Ø8 Ø81E Ø8Ø8 Ø8Ø8 ØØØØ ØØØØ ØØØØ 3C42
34ØØ: 4242 423E Ø242 3C4Ø 4Ø4Ø 7C42 4242 4242
341Ø: ØØØØ ØØØØ 1ØØØ 3Ø1Ø 1Ø1Ø 1Ø7C ØØØØ ØØØØ
342Ø: ØØØ2 ØØØ6 Ø2Ø2 Ø2Ø2 Ø242 3C4Ø 4Ø44 487Ø
343Ø: 4844 4242 ØØØØ ØØ1Ø 1Ø1Ø 1Ø1Ø 1Ø1Ø 1Ø1Ø
344Ø: ØØØØ ØØØØ ØØØØ 7749 4941 4141 ØØØØ ØØØØ
345Ø: ØØØØ 5C62 4242 4242 ØØØØ ØØØØ ØØØØ 3C42
346Ø: 4242 423C ØØØØ ØØØØ ØØØØ 7C42 4242 427C
347Ø: 4Ø4Ø 4ØØØ ØØØØ 3C42 4242 423E Ø2Ø2 Ø3ØØ
348Ø: ØØØØ 4C52 6Ø4Ø 4Ø4Ø ØØØØ ØØØØ ØØØØ 3E4Ø
349Ø: 3CØ2 Ø27C ØØØØ ØØØ8 Ø8Ø8 3EØ8 Ø8Ø8 ØAØ4
34AØ: ØØØØ ØØØØ ØØØØ 4242 4242 463A ØØØØ ØØØØ
34BØ: ØØØØ 4242 4242 2418 ØØØØ ØØØØ ØØØØ 4141
34CØ: 4149 4977 ØØØØ ØØØØ ØØØØ 4224 1818 2442
34DØ: ØØØØ ØØØØ ØØØØ 4242 4242 423E Ø242 3CØØ
34EØ: ØØØØ 7EØ2 Ø418 2Ø7E ØØØØ ØØØØ ØØØØ
```

#### TRACK RACER ####

HITACHI PEACH

```
1Ø REM TRACK RACER BY D.C. KELLY,2Ø RUTH
 ST. CORINDA,BRISBANE,4Ø75
2Ø WIDTH4Ø:INPUT"DO YOU WANT DIRECTIONS
(Y/N)";DR$:IFDR$="Y"THEN22Ø
3Ø RANDOMIZE(PEEK(&HFFEØ)*255+PEEK(&HFFE
Ø)):Z=2Ø:B$=CHR$(254):D$=CHR$(94):S$=CHR
$(92):TIME$="ØØ:ØØ:ØØ":SCREEN Ø:WIDTH4Ø
4Ø FORY=ØTO24
```

```
5Ø PRINTTAB(15)B$;:PRINTTAB(25)B$
6Ø NEXT
7Ø X1=INT(RND*9+1)+15
8Ø PRINTTAB(15)B$;:PRINTTAB(X1)D$;:PRINT
TAB(25)B$
9Ø X=POS(Ø):Y=CSRLIN
1ØØ LOCATEZ,11:PRINT" "
11Ø K$=INKEY$:IFK$=""THEN14Ø
12Ø IFASC(K$)=28THENZ=Z+1
13Ø IFASC(K$)=29THENZ=Z-1
14Ø IF SCREEN(Z,12)<>32THEN 18Ø
15Ø LOCATEZ,12:PRINTS$:LOCATEØ,Ø:PRINTTI
ME
16Ø LOCATEX,Y
17Ø GOTO7Ø
18Ø LOCATEØ,Ø:BEEP(1):PRINT"CRASHED  INS
=PLAY AGAIN  DEL=FINISH":PRINT"TIME=";TI
ME
19Ø K$=INKEY$:IFK$=""THEN19ØELSEIFASC(K$
)=18THENCLS:RUN
2ØØ IF ASC(K$)=8THENCLS:END
21Ø GOTO19Ø
22Ø PRINTTAB(14)"TRACK RACER":PRINT"The
object is to steer a car (";CHR$(92);")
for as long as possible,without       hi
tting any obstacles,or going off the  tr
ack.You control it with the left and  ri
ght arrows of the cursor control keys.":
FORI=1TO9ØØØ
23Ø NEXTI:GOTO3Ø
```

**** L2/16K   AUSTRALIA'S CUP   (AUSCUP/DAT) ****

TRS-8Ø/SYSTEM-8Ø

```
1 REM           ***************
                * AUSCUP/DAT  *
                ***************
2 CLS:CLEAR3ØØØ:DEFINTT:DIMA$(13):REM
DELETE THIS LINE BEFORE TYPING IN THE REST OF THE PROGRAM!!
135Ø AC$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 12345"
136Ø T$(1)="123456789 123456789 123456789 123456789 123"
137Ø T$(2)="123456789 123456789 123456789 123456789 123"
138Ø T$(3)="123456789 123456789 123456789 123456789 123"
139Ø SR$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 "
14ØØ RR$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 "
141Ø CS$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 "
142Ø SL$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 "
143Ø RL$="123456789 123456789 123456789 123456789 123456789 1234
56789 123456789 123456789 "
144Ø A$(1)="123456789 123456789 123456789 123456789 123456789 "
145Ø A$(2)="123456789 123456789 123456789 123456789 123456789 "
146Ø A$(3)="123456789 123456789 123456789 123456789 123456789 "
147Ø A$(4)="123456789 123456789 123456789 123456789 123456789 "
148Ø A$(5)="123456789 123456789 123456789 123456789 123456789 "
149Ø A$(6)="123456789 123456789 123456789 123456789 123456789 "
15ØØ A$(7)="123456789 123456789 123456789 123456789 123456789 "
151Ø A$(8)="123456789 123456789 123456789 123456789 123456789 "
152Ø A$(9)="123456789 123456789 123456789 123456789 123456789 "
153Ø A$(1Ø)="123456789 123456789 123456789 123456789 123456789 "
154Ø A$(11)="123456789 123456789 123456789 123456789 123456789 "
155Ø A$(12)="123456789 123456789 123456789 123456789 123456789 "
156Ø A$(13)="123456789 123456789 123456789 123456789 123456789 "
5ØØØ PRINTCHR$(23);
5Ø1Ø AC=PEEK(VARPTR(AC$)+2)*256+PEEK(VARPTR(AC$)+1):FORT=ØTO84:G
OSUB539Ø:POKEAC+T,X:NEXT
5Ø2Ø DATA16Ø,191,191,191,143,191,191,191,144,26,24,24,24,24,24,2
4,24,24,24,165,138,191,149,179,17Ø,191,133,154,26,24,24,24,24,24
,24,24,24,24,32,131,139,191,191,191,135,131,32,26,24,24,24,24,24
,24,24,24,24,32,32,32,162,191,145,32,32,32
5Ø3Ø DATA26,24,24,24,24,24,24,24,24,24,32,131,131,131,131,131,13
1,131,32
5Ø4Ø T1=PEEK(VARPTR(T$(1))+2)*256+PEEK(VARPTR(T$(1))+1):FORT=ØTO
42:GOSUB539Ø:POKET1+T,X:NEXT
5Ø5Ø T2=PEEK(VARPTR(T$(2))+2)*256+PEEK(VARPTR(T$(2))+1):FORT=ØTO
42:GOSUB539Ø:POKET2+T,X:NEXT:T3=PEEK(VARPTR(T$(3))+2)*256+PEEK(V
ARPTR(T$(3))+1):FORT=ØTO42:GOSUB539Ø:POKET3+T,X:NEXT
5Ø6Ø DATA152,137,144,149,32,149,15Ø,131,132,131,151,129,151,131,
148,152,137,144,149,32,32,131,151,129,152,137,144,134,129,15Ø,13
1,132,32,32,168,131,137,17Ø,32,17Ø,17Ø,131,169
5Ø7Ø DATA151,131,149,149,32,149,146,131,148,32,149,32,151,167,32
,151,131,149,149,32,32,32,149,32,151,131,149,32,32,146,131,148,3
2,32,17Ø,32,16Ø,17Ø,32,17Ø,17Ø,131,129
5Ø8Ø DATA129,32,129,13Ø,131,32,13Ø,131,32,32,129,32,129,32,129,1
29,32,129,131,131,129,131,131,129,129,32,129,32,32,13Ø,131,32,32
,32,32,131,129,32,131,129,13Ø,32,32
5Ø9Ø SR=PEEK(VARPTR(SR$)+2)*256+PEEK(VARPTR(SR$)+1):FORT=ØTO79:G
OSUB539Ø:POKESR+T,X:NEXT
51ØØ DATA32,32,32,16Ø,19Ø,17Ø,168,144,32,32,32,26,24,24,24,24,24
,24,24,24,24,24,24,32,32,184,191,191,17Ø,17Ø,191,18Ø,32,32,26,24
,24,24,24,24,24,24,24,24,24,32,178,179,179,179,186,178,179,17
9,177,32,26,24,24,24,24,24,24,24,24,24,24,24
511Ø DATA32,32,131,131,131,131,131,131,131,32,32
512Ø RR=PEEK(VARPTR(RR$)+2)*256+PEEK(VARPTR(RR$)+1):FORT=ØTO79:G
OSUB539Ø:POKERR+T,X:NEXT
513Ø DATA32,32,32,32,16Ø,19Ø,144,32,32,32,32,26,24,24,24,24,24,2
4,24,24,24,24,24,32,32,32,32,19Ø,191,189,32,32,32,32,26,24,24,24
,24,24,24,24,24,24,24,24,32,32,32,178,179,187,179,177,32,32,32,2
6,24,24,24,24,24,24,24,24,24,24,24
514Ø DATA32,32,32,13Ø,131,131,131,129,32,32,32
```

```
5150 CS=PEEK(VARPTR(CS$)+2)*256+PEEK(VARPTR(CS$)+1):FORT=0TO79:G
OSUB5390:POKECS+T,X:NEXT
5160 DATA32,32,32,32,170,32,32,32,32,32,26,24,24,24,24,24,24,
24,24,24,24,24,32,32,32,32,32,170,32,32,32,32,32,26,24,24,24,24,
24,24,24,24,24,24,24,32,32,32,32,160,186,176,32,32,32,32,26,24,2
4,24,24,24,24,24,24,24,24,24
5170 DATA32,32,32,32,32,131,129,32,32,32,32
5180 SL=PEEK(VARPTR(SL$)+2)*256+PEEK(VARPTR(SL$)+1):FORT=0TO79:G
OSUB5390:POKESL+T,X:NEXT
5190 DATA32,32,32,184,170,170,180,32,32,32,32,26,24,24,24,24,24,
24,24,24,24,24,32,160,190,191,170,170,191,189,144,32,32,26,24
,24,24,24,24,24,24,24,24,24,160,179,179,179,186,178,179,179,1
79,144,32,26,24,24,24,24,24,24,24,24,24,24,24
5200 DATA32,130,131,131,131,131,131,131,129,32,32
5210 RL=PEEK(VARPTR(RL$)+2)*256+PEEK(VARPTR(RL$)+1):FORT=0TO79:G
OSUB5390:POKERL+T,X:NEXT
5220 DATA32,32,32,32,32,186,180,32,32,32,32,26,24,24,24,24,24,24
,24,24,24,24,24,32,32,32,32,168,191,191,148,32,32,32,26,24,24,24
,24,24,24,24,24,24,24,24,32,32,32,160,179,187,179,179,144,32,32,
26,24,24,24,24,24,24,24,24,24,24,24
5230 DATA32,32,32,32,131,131,131,131,32,32,32
5240 FORG=1TO13:AA=PEEK(VARPTR(A$(G))+2)*256+PEEK(VARPTR(A$(G))+
1):FORT=0TO49:GOSUB5390:POKEAA+T,X:NEXTT:NEXTG
5250 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,3
2,32,32,32,32,32,32,32,32,160,176,176,176,32,32,32,32,32,32,32,1
60,148,32,32,32,32,32,32,32,32,32,32,32
5260 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,3
2,32,32,176,176,32,160,190,191,191,191,191,191,191,32,32,32,32,3
2,160,191,191,180,144,32,32,32,32,32,32,32,32
5270 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,160,144
,176,188,191,191,191,183,191,191,78,84,191,191,191,191,189,156,1
76,176,160,186,191,191,191,191,144,32,32,32,32,32,32,32
5280 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,176,176,188,191,
191,191,191,191,191,191,157,191,191,191,191,191,191,191,191,191,
149,191,191,191,191,191,191,191,191,191,188,144,32,32,32,32,32
5290 DATA32,32,32,32,32,32,32,32,184,188,191,191,191,191,191,
191,191,191,191,191,191,191,183,191,191,191,191,191,191,191,191,
191,149,191,191,191,191,81,76,68,191,191,191,191,188,180,144,32,
32
5300 DATA32,32,32,32,32,32,32,32,189,191,191,191,191,191,191,191
,191,191,191,191,191,191,191,157,159,159,159,159,159,159,159,159
,159,149,159,159,191,191,191,191,191,191,191,191,191,191,191,189
,176,32
5310 DATA32,32,32,32,32,32,136,178,191,191,191,191,87,65,191,
191,191,191,191,191,191,191,183,191,191,191,83,65,191,191,191,19
1,191,191,157,159,159,159,159,159,159,159,159,159,159,159,159,15
9,191
5320 DATA32,32,32,32,32,32,32,130,175,191,191,191,191,191,191
,191,191,191,191,191,191,191,157,191,191,191,191,191,191,191,191
,191,191,191,183,191,191,191,191,191,191,78,83,87,191,191,191,19
1,151
5330 DATA32,32,32,32,32,32,32,32,32,130,175,191,191,191,191,1
91,191,191,191,143,143,135,131,131,32,32,130,131,131,143,191,135
,187,191,157,187,187,187,187,159,159,159,191,191,191,191,191,135
,32
5340 DATA32,32,32,32,32,32,32,32,32,32,32,138,191,191,159,143,13
1,129,32,32,32,32,32,32,32,32,32,32,32,32,32,32,130,130,129,137,
191,191,191,86,73,67,191,189,189,143,131,129,32,32
5350 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,3
2,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,131,131,191
,143,175,191,191,143,135,32,32,32,32,32
5360 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,3
2,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,13
8,188,188,132,84,65,83,32,32,32,32
5370 DATA32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,3
2,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32,32
,131,129,32,32,32,32,32,32,32,32
5380 DELETE5000-5430
5390 READX
5400 V=V+1:IFV<10THENPRINT@410,"        ";:RETURN
5410 IFV>=10ANDV<=20THENPRINT@410,"Standby!";
5420 IFV>20THENV=0
5430 RETURN
```

**** L2/16K   AUSTRALIA'S CUP   (AUSCUP/LST) ****

```
10 OUT254,0:CLEAR400:DIMA$(13):GOSUB1010:CLS:PRINTTAB(15)"T h e
  A u s t r a l i a ' s   C u p":PRINTSTRING$(64,140)
20 MS$="How many are playing ?":PP=192:SL=1:GOSUB920:IFVAL(QQ$)<
1ORVAL(QQ$)>6THEN20
30 NP=VAL(QQ$):CLS:PRINT"Player's names are now required.":PRINT
STRING$(64,140):PP=192:FORZ=1TONP:MS$="Player "+STR$(Z)+", pleas
e enter name ?":SL=10:GOSUB920:PN$(Z)=QQ$:PP=PP+64:NEXTZ
40 CLS:PRINT"Please place bets ! (Max: $100)":PRINTSTRING$(64,14
0):GOSUB1580:PRINT"Defending yacht is ";DF$;" at ";DO$:PRINT"Cha
llenging yacht is ";CH$;" at ";CO$:PRINT
50 PP=384:FORZ=1TONP:MS$=PN$(Z)+", please make your bet ?":SL=3:
GOSUB920:PB(Z)=VAL(QQ$):GOSUB1810:PP=PP+64:NEXTZ
60 PRINT@384,CHR$(31);
70 PP=384:FORZ=1TONP:MS$=PN$(Z)+", who do you bet on, C or D ?":
SL=1:GOSUB920:IFQQ$="C"ORQQ$="c"ORQQ$="D"ORQQ$="D"THENPB$(Z)=QQ$
:PP=PP+64:NEXTZELSEZ=Z-1:NEXTZ
80 PRINT@832,"The challenging yacht comes from ";CN$;CHR$(31);
90 PRINT@979,"Press any key for the first race!";:FORT=1TO5000
100 IFPEEK(15359)=0THENNEXT:RUN
110 RN=0
120 RANDOM:DS=259:CS=579:DD=1:CD=1:CL=0:DL=0:CT=0:DT=0:MN=0:SE=0
130 RN=RN+1
140 OUT254,116:CLS:PRINT@0,"Race ";RN;" - Between ";DF$;" and ";
CH$
150 PRINT@266,SR$;:PRINT@266+89,DF$;:PRINT@586,SR$;:PRINT@586+89
,CH$;:FORG=1TO800:NEXTG:PRINT@64,CHR$(31);:FORT=1TO50:PRINT@RND(
896)+64,".";:NEXT
160 PRINT@DS,SR$;:PRINT@CS,SR$;
170 ONRND(2)GOSUB370,380
180 IFCL=5THEN530ELSEIFDL=5THEN630
```

```
190 IFCT>DTTHENPRINT@0,"The Challenger ";CHR$(34);CH$;CHR$(34);"
 leads.";CHR$(30);
200 IFDT>CTTHENPRINT@0,"The Defender ";CHR$(34);DF$;CHR$(34);" l
eads.";CHR$(30);
210 GOTO170
220 GOTO220
230 IFDS>=305THEN250ELSEDS=DS+DD
240 PRINT@DS,SR$;:RETURN
250 DC=DC+1:IFDC=1THENPRINT@DS,RR$;:RETURN
260 IFDC=2THENPRINT@DS,CS$;:RETURN
270 IFDC=3THENPRINT@DS,RL$;:RETURN
280 IFDC=4THENDC=0:PRINT@DS,SL$;:DD=-1:DL=DL+1
290 RETURN
300 IFDS<=260THEN320ELSEDS=DS+DD
310 PRINT@DS,SL$;:RETURN
320 DC=DC+1:IFDC=1THENPRINT@DS,RL$;:RETURN
330 IFDC=2THENPRINT@DS,CS$;:RETURN
340 IFDC=3THENPRINT@DS,RR$;:RETURN
350 IFDC=4THENDC=0:PRINT@DS,SR$;:DD=1:DL=DL+1
360 RETURN
370 DT=DT+1:IFDD=1THEN230ELSE300
380 CT=CT+1:IFCD=1THEN390ELSE460
390 IFCS>=625THEN410ELSECS=CS+CD
400 PRINT@CS,SR$;:RETURN
410 CC=CC+1:IFCC=1THENPRINT@CS,RR$;:RETURN
420 IFCC=2THENPRINT@CS,CS$;:RETURN
430 IFCC=3THENPRINT@CS,RL$;:RETURN
440 IFCC=4THENCC=0:PRINT@CS,SL$;:CD=-1:CL=CL+1
450 RETURN
460 IFCS<=580THEN480ELSECS=CS+CD
470 PRINT@CS,SL$;:RETURN
480 CC=CC+1:IFCC=1THENPRINT@CS,RL$;:RETURN
490 IFCC=2THENPRINT@CS,CS$;:RETURN
500 IFCC=3THENPRINT@CS,RR$;:RETURN
510 IFCC=4THENCC=0:PRINT@CS,SR$;:CD=1:CL=CL+1
520 RETURN
530 FORG=1TO600:NEXTG:CLS:OUT254,0:PRINT"The Challenging ship ";
CH$;" from ";CN$;" has won!"
540 PRINT:PRINT
550 CT=(CT-DT)*6:MN=INT(CT/60):SE=CT-(MN*60)
560 PRINT"The Challenger won by ";MN;" minutes & ";SE;" seconds.
"
570 PRINT
580 CW=CW+1:IFCW>=4THEN740
590 PRINT"The tally so far is:":PRINT"--------------------"
600 PRINT"Challenger has won ";CW
610 PRINT"Defender has won ";DW
620 PRINT:PRINT:INPUT"Press <ENTER> to start the next race";ZZ$:
GOTO120
630 FORG=1TO600:NEXTG:CLS:OUT254,0:PRINT"The Defending ship ";DF
$;" won!!!"
640 PRINT:PRINT"Australia will be celebrating !!"
650 PRINT:PRINT
660 DT=(DT-CT)*6:MN=INT(DT/60):SE=DT-(MN*60)
670 PRINT"The Defender won by ";MN;" minutes & ";SE;" seconds."
```

```
680 PRINT
690 DW=DW+1:IFDW>=4THEN750
700 PRINT"The tally so far is:":PRINT"--------------------"
710 PRINT"Defender has won ";DW
720 PRINT"Challenger has won ";CW
730 PRINT:PRINT:INPUT"Press <ENTER> to start the next race";ZZ$:
GOTO120
740 FORG=1TO800:NEXTG:WI$=CH$:GOTO760
750 FORG=1TO800:NEXTG:WI$=DF$
760 CLS:PRINT"The Australia's cup has come to an end !!"
770 PRINT:PRINT"The winning yacht was ";WI$;" from ";
780 IFWI$=DF$THENPRINT"Australia !"ELSEPRINTCN$
790 PRINT
800 IFWI$=DF$THENPRINT"Australia has defended the cup yet again
!!"ELSEPRINTCN$;" has won the cup from Australia !!"
810 PRINT@512,"                ";AC$:PRINT@512+30+64,"";
820 IFWI$=DF$THENPRINT"<-- Australia's Cup";ELSEPRINT"<-- ";CN$;
"'s Cup";
830 PRINT@896,"";:INPUT"Press <ENTER> to see betting results";ZZ
$
840 IFWI$=DF$THENX$="D":XX$="d":XV=DVELSEX$="C":XX$="c":XV=CV
850 FORZ=1TONP:IFPB$(Z)=X$ORPB$(Z)=XX$THENPB(Z)=PB(Z)*XV:Z$(Z)="
won"ELSEPB(Z)=0:Z$(Z)="lost"
860 NEXTZ
870 CLS:PRINT"The betting results for all players are below.":PR
INTSTRING$(64,140);
880 FORZ=1TONP:PRINTPN$(Z);" has ";Z$(Z);
890 IFPB(Z)=0THENPRINT" !"ELSEPRINT" ";PB(Z)
900 NEXTZ:PRINTSTRING$(64,140)
910 MS$="Press <ENTER> for another Australia's Cup":PP=960:SL=1:
GOSUB920:RUN
920 QQ$="":PRINT@PP,MS$;" ";
930 FORT=1TOSL:PRINTCHR$(95);:NEXT:FORT=1TOSL:PRINTCHR$(24);:NEX
T
940 AS$=INKEY$
950 IFAS$=""THEN940
960 IFAS$=CHR$(8)ANDLEN(QQ$)=0THEN940
970 QQ$=QQ$+AS$:IFAS$=CHR$(13)THENQQ$=LEFT$(QQ$,LEN(QQ$)-1):RETU
RN
980 PRINTAS$;:IFAS$=CHR$(8)THENQQ$=LEFT$(QQ$,LEN(QQ$)-2):PRINTCH
R$(95);CHR$(24);:GOTO940
990 IFLEN(QQ$)=SLTHENRETURN
1000 GOTO940
1010 GOTO1350
1020 CLS:FORT=1TO3:PRINT"          ";T$(T):NEXT:FORT=1TO12:PRINT
"   ";A$(T):NEXT:PRINT"        "A$(13);
1030 PRINT@769,"You    -->";:PRINT@833,"are";:PRINT@896,"here!";
1040 FORH=1TO25
1050 PRINT@780,"X";
1060 FORG=1TO90:NEXTG
1070 PRINT@780," ";
1080 FORG=1TO90:NEXTG
1090 IFINKEY$=""THENNEXT:GOTO1880ELSE1100
1100 CLS:MS$="Do you require instructions ?":PP=512:SL=1:GOSUB92
0:IFQQ$="N"ORQQ$="n"THENRETURN
```

```
1110 CLS:PRINT"  W e l c o m e   t o   t h e  ";CHR$(34);" A U S T
 R A L I A ' S   C U P ";CHR$(34):PRINTSTRING$(64,140);
1120 PRINT"On the 26th of September 1983, the America's Cup was
lost by theAmerican yacht 'Liberty' to the Australian yacht 'Aus
tralia II'"
1130 PRINT"This day will go down in history because a 132 year w
inning     streak finally came to an end. The people of Australi
a rejoiced in Australia II's triumph and celebrated the win for
many days  (and nights) after the glorious event."
1140 PRINT"The America's cup (affectionately known as The Auld M
ug) was     transported to Australia and to the Royal Perth Yacht
 Club whereit was gazed upon in wonder by all."
1150 PRINT"The Auld Mug's previous home had been the New York Ya
cht Club   which was renowned for its sly and devious tactics us
ed to stop the cup from leaving their shores.":PRINTSTRING$(64,1
40);
1160 PRINT@979,"Press any key to continue";
1170 IFPEEK(15359)=0THEN1170
1180 CLS:PRINT"                 T h e   A U S T R A L I A ' S   C U
P"
1190 PRINTSTRING$(64,140);
1200 PRINT"The New York Yacht Club could not defeat Australia II
 neither   on shore or off and had to surrender the cup to syndi
cate head  Alan Bond and the Australian crew."
1210 PRINT"Australia II owed much of its success to the controve
rsial      'Winged Keel' as well as its sturdy management."
1220 PRINT"The Australian Yacht earned a good reputation as well
 as a few  nicknames - One of these being 'The wonder from Down
Under'."
1230 PRINT:PRINT"It is now some time after that glorious day and
 you must defend the Australia's Cup. Australia II will not be c
ompeting as it isnow in a museum, stuffed, along with other spor
ting greats such as Dennis Lillee & Robert de Castella."
1240 PRINTSTRING$(64,140);:PRINT@979,"Press any key to continue"
;
1250 IFPEEK(15359)=0THEN1250
1260 CLS:PRINT"                 T h e   A U S T R A L I A ' S   C U
P":PRINTSTRING$(64,140);
1270 PRINT"The challengers for this years cup were from the Unit
ed States, England and New Zealand. The Australian trials have a
lready beenheld to decide the defender and the challengers have
all        competed to decide the challenger."
1280 PRINT"The Australias Cup will be awarded to the yacht that
wins the   best of seven races to be held in the forthcoming wee
k."
1290 PRINTSTRING$(64,140);
1300 PRINT"Up to 6 people can bet on the outcome of the seven ra
ces. The   names of the Challenging and Defending yachts will be
 displayed along with the odds for each."
1310 PRINT:PRINT"Australia's Cup (C) 10/83 by Carl Cranstone. Al
l Rights Reserved";
1320 PRINT@979,"Press any key to start.";
1330 IFPEEK(15359)=0THEN1330
1340 RETURN
1350 '**********************************************************
1360 '*                                                         *
1370 '*                                                         *
1380 '*                                                         *
1390 '*                                                         *
1400 '* THESE LINES WILL CONTAIN THE GRAPHIC STRINGS            *
1410 '*                                                         *
1420 '*                                                         *
1430 '*                                                         *
1440 '*                                                         *
1450 '*                                                         *
1460 '*                                                         *
1470 '*                                                         *
1480 '*                                                         *
1490 '*                                                         *
1500 '*                                                         *
1510 '*                                                         *
1520 '*                                                         *
1530 '*                                                         *
1540 '*                                                         *
1550 '*                                                         *
1560 '**********************************************************
1570 GOTO1020
1580 RESTORE:FORT=1TO1000:READS$:IFS$<>"AUSSIE"THENNEXTT
1590 FORT=1TORND(10):READS$:NEXT:DF$=S$:FORT=1TO1000:READS$:IFS$
<>"THEM"THENNEXTT
1600 U=RND(30):FORT=1TOU:READS$:NEXT:CH$=S$
1610 IFU<=10THENCN$="America"
1620 IFU>10ANDU<=20THENCN$="England"
1630 IFU>20ANDU<=30THENCN$="New Zealand"
1640 X=RND(7):ONXGOTO1650,1660,1670,1680,1690,1700,1710
1650 DO$="2/1":DV=2:GOTO1720
1660 DO$="5/1":DV=5:GOTO1720
1670 DO$="10/1":DV=10:GOTO1720
1680 DO$="20/1":DV=20:GOTO1720
1690 DO$="40/1":DV=40:GOTO1720
1700 DO$="50/1":DV=50:GOTO1720
1710 DO$="100/1":DV=100:GOTO1720
1720 X=RND(7):ONXGOTO1730,1740,1750,1760,1770,1780,1790
1730 CO$="2/1":CV=2:GOTO1800
1740 CO$="5/1":CV=5:GOTO1800
1750 CO$="10/1":CV=10:GOTO1800
1760 CO$="20/1":CV=20:GOTO1800
1770 CO$="40/1":CV=40:GOTO1800
1780 CO$="50/1":CV=50:GOTO1800
1790 CO$="100/1":CV=100:GOTO1800
1800 RETURN
1810 IFPB(Z)>=0ANDPB(Z)<=100THENRETURN
1820 PP=PP-64:PRINT@960,"Sorry ";PN$(Z);", but you're bet is ill
egal!!";:PRINT@PP+64,CHR$(30);:PB(Z)=0:Z=Z-1:RETURN
1830 RETURN
1840 DATA"AUSSIE",Australia III,Down Under,Kangaroo I,Kangaroo I
I,Koala I,Emu II,Aussie Crawl,Kookaburra I,Advance II,Wallaby I
1850 DATA"THEM",Yankee I,Yankee II,Liberty,Stars n' Stripes,Newp
ort,Yankee Doodle,Boston Strangler,Lost Angeles,Apple Pie,Titani
c I
```

```
1860 DATAUnion Jack,Royal I,Britannia II,Victorious,Unsinkable,B
odyline '32,Victory '83,Britain I,Britain II,England III
1870 DATAKiwi I,Kiwi II,Auckland I,Wellington II,New Zealand I,I
ntrepid II,Restless Native,N.Z. Challenge,KeelHaul,Deadly Weopon
1880 OUT254,116:DS=259:CS=579:DD=1:CD=1:CLS:PRINT@0,"   Australi
a's Cup (c) 1983 by Carl Cranstone ** Demo Mode **":PRINTSTRING$
(64,131);
1890 DE$="
        ** Australia's Cup **  -  ** Press <ENTER> to start **
  -  ** For up to six players **
                                 "
1900 FORT=1TO50:PRINT@RND(832)+128,".";:NEXT
1910 X=RND(2):ONXGOSUB370,380
1920 IFPEEK(15359)<>0THENRUN
1930 ZZ=ZZ+1:IFZZ>=LEN(DE$)THENZZ=0ELSEPRINT@960,MID$(DE$,ZZ,62)
;:GOTO1910
1940 V=V+1:IFV=2THENRUNELSE1910
```

**** L2/16K   AUSTRALIA'S CUP   (AUSCUP/LNW) ****

```
10 MODE2:OUT254,116:PCLS5:FLS
20 COLOR4:LINE0,0,159,11,SET,BF
30 COLOR2:LINE0,48,159,79,SET,BF
40 COLOR1:LINE0,80,159,88,SET,BF
50 COLOR6:LINE0,104,159,139,SET,BF
60 COLOR3:LINE0,140,159,147,SET,BF
70 COLOR7:LINE128,0,159,191,SET,BF
80 GOTO80
90 REM PSAVE"AUSCUP/GRF"
```

**** 32K/DISK   GRAFX INIT PROGRAM ****

TRS-80/SYSTEM-80

```
10 CLS:CLEAR3000:OPEN"O",1,"BIGLTRS"
20 FORX=1TO 414:READY:PRINT#1,Y;:NEXT:CLOSE:END
30 DATA 152, 137, 144, 157, 140, 149, 129, 32, 129, 151, 131, 14
8, 151, 131, 148, 131, 131, 32, 150, 131, 132, 149, 32, 144, 130
, 131, 32, 151, 131, 148, 149, 32, 149, 131, 131, 32, 151, 131,
129, 151, 131, 32, 131, 131, 129
40 DATA 151, 131, 129, 151, 129, 32, 129, 32, 32, 150, 131, 132,
 149, 136, 148, 130, 131, 32, 149, 32, 149, 151, 131, 149, 129,
32, 129, 130, 151, 32, 32, 149, 32, 130, 131, 32, 130, 131, 149,
 144, 32, 149, 130, 131, 32, 149
50 DATA 152, 129, 151, 164, 32, 129, 32, 129, 149, 32, 32, 149,
32, 32, 131, 131, 129, 157, 152, 149, 149, 32, 149, 129, 32, 129
, 181, 32, 149, 149, 137, 149, 129, 32, 129, 150, 131, 148, 149,
 32, 149, 130, 131, 32, 151, 131
60 DATA 148, 151, 131, 32, 129, 32, 32, 150, 131, 148, 149, 164,
 149, 130, 131, 129, 151, 131, 148, 151, 167, 32, 129, 32, 129,
150, 131, 132, 146, 131, 148, 130, 131, 128, 131, 151, 129, 32,
149, 32, 32, 129, 32, 149, 32
70 DATA 149, 149, 32, 149, 130, 131, 32, 149, 32, 149, 165, 160,
 133, 32, 129, 32, 149, 32, 149, 149, 148, 149, 131, 131, 129, 1
65, 160, 133, 152, 137, 144, 129, 32, 129, 149, 32, 149, 130, 15
0, 32, 32, 129, 32, 131, 163
80 DATA 133, 152, 129, 32, 131, 131, 129, 32, 32, 32, 32, 32, 32
, 32, 32, 32, 134, 163, 132, 32, 133, 32, 32, 129, 32, 32, 149,
32, 32, 133, 32, 32, 129, 32, 32, 32, 32, 32, 32, 32, 32, 131, 3
2, 32, 32, 32, 32, 140, 32, 32
90 DATA 131, 32, 32, 32, 32, 140, 32, 32, 139, 32, 32, 32, 3
2, 32, 32, 32, 32, 139, 32, 136, 149, 32, 32, 149, 32, 130, 131,
 32, 134, 131, 148, 152, 131, 32, 131, 131, 129, 134, 131, 148,
144, 131, 148, 130, 131, 32, 160
100 DATA 174, 32, 141, 174, 132, 32, 130, 32, 183, 179, 129, 144
, 32, 149, 130, 131, 32, 152, 131, 129, 151, 131, 148, 130, 131,
 32, 131, 163, 133, 32, 149, 32, 32, 129, 32, 150, 131, 148, 150
, 131, 148, 130, 131, 32, 150
110 DATA 131, 148, 130, 163, 133, 131, 129, 32, 150, 163, 148, 1
57, 129, 149, 130, 131, 32, 184, 184, 144, 174, 174, 132, 128, 1
28, 128, 164, 181, 132, 155, 159, 145, 128, 129, 128, 156, 157,
132, 179, 183, 149, 128, 129, 32
```

**** 32K/DISK   GRAFX ****

```
10 CLS:CLEAR2000:READL:DIML(L),T$(L)
20 FORX=1TOL:READL(X):NEXT:FORX=1TOL:FORY=1TOL(X):READC:T$(X)=T$
(X)+CHR$(C):NEXTY,X
30 FORX=1TOL:PRINT@(X-1)*64,T$(X);:NEXT
40 DATA3,19,19,19
50 DATA150,131,132,32,151,131,148,32,152,137,144,32,151,131,129,
32,165,160,133,149,136,148,32,151,167,32,32,157,140,149,32,151,1
29,32,32,152,137,144,130,131,32,32,129,32,129,32
60 DATA129,32,129,32,129,32,32,32,129,32,129
70 PRINT@192,STRING$(64,131):PRINT@108,"Bob Wilson Software";
80 PRINT@256,CHR$(31)"One moment please":CMD"F",DELETE 10-70
90 CLEAR50:CLEARMEM-8500:DEFINTA-Z:DEFSTRW,P:GOTO210
100 A$=INKEY$:IFA$=""THEN100ELSERETURN
110 CP=FIX(Y/3)*64+FIX(X/2)+15360:RETURN
120 SET(X,Y):FORZ=1TO8:A=PEEK(14400):B=PEEK(14368):IFA=0ANDB=0TH
ENNEXTZ:RESET(X,Y):FORZ=1TO8:A=PEEK(14400):B=PEEK(14368):IFA=0AN
DB=0THENNEXTZ:GOSUB190:IFA=0THEN120ELSERETURN
130 IFM=0THENSET(X,Y)ELSERESET(X,Y)
140 GOSUB150:GOTO120
150 IFAAND8THENY=Y+(Y>0)*1:RETURN
160 IFAAND16THENY=Y-(Y<44)*1:RETURN
170 IF(AAND32)OR(BAND16)THENX=X+(X>0)*1:RETURN
180 IF(AAND64)OR(BAND64)THENX=X-(X<127)*1:RETURN
190 A$=INKEY$:IFA$=""THENA$=" "
200 A=INSTR("CDETX",A$):IFATHENRETURNELSEA=INSTR("cdetx",A$):RET
URN
210 W1=CHR$(31):W3="[
"+CHR$(08)+CHR$(09)+",.":W2=W1+"GRAFX MODE : %       % : use ARRO
WS or < > ESC CTRL"
220 X$="ABCDEFGHIJKLMNOPQRSTUVWXYZ ?!.:;,1234567890#*$":X1$="abc
defghijklmnopqrstuvwxyz":DIMT$(LEN(X$),3),SS%(3360),G$(25),P(25)
,U(15)
```

```
230 OPEN"I",1,"BIGLTRS":PRINT"Initializing HUGE letters":FORX=1T
OLEN(X$):FORY=1TO3:FORZ=1TO3:INPUT#1,C:T$(X,Y)=T$(X,Y)+CHR$(C):N
EXTZ::NEXTY,X:CLOSE
240 FORX=ØTO15:READU(X):NEXT:J=Ø:CLS:S$="S":FORSN%=1TO7:GOSUB79Ø
:NEXT
250 PRINT@96Ø,"<C>lear  <G>rafx  <H>uge  <S>ave  <R>ecall  <P>ro
gram  <E>nd";:GOSUB1ØØ
260 S=INSTR("CGHPSRE",A$):IFSTHENONSGOSUB3ØØ,31Ø,47Ø,62Ø,77Ø,78Ø
,83Ø
270 S=INSTR("cghpsre",A$):ONSGOSUB3ØØ,31Ø,47Ø,62Ø,77Ø,78Ø,83Ø
280 GOTO25Ø
290 ONAGOTO32Ø,36Ø,37Ø,38Ø,25Ø
300 CLS:RETURN
310 X=Ø:Y=Ø
320 PRINT@96Ø,USINGW2;"CURSOR";
330 GOSUB11Ø:CH=PEEK(CP)
340 POKECP,32:SET(X,Y):FORZ=1TO8:A=PEEK(144ØØ):B=PEEK(14368):IFA
=ØANDB=ØTHENNEXTZ:POKECP,CH:FORZ=1TO8:A=PEEK(144ØØ):B=PEEK(14368
):IFA=ØANDB=ØTHENNEXTZ:GOSUB19Ø:IFA=ØTHEN34ØELSE29Ø
350 POKECP,CH:GOSUB15Ø:GOTO33Ø
360 PRINT@96Ø,USINGW2;"DRAW";:M=Ø:GOSUB12Ø:SET(X,Y):GOTO29Ø
370 PRINT@96Ø,USINGW2;"ERASE";:M=1:GOSUB12Ø:GOTO29Ø
380 PRINT@96Ø,W1"TEXT Mode :  <ENTER> to Exit";:GOSUB11Ø
390 CH=PEEK(CP):POKECP,14Ø:FORZ=1TO1Ø:A$=INKEY$:IFA$=""THENNEXT:
POKECP,CH:FORZ=1TO1Ø:A$=INKEY$:IFA$=""THENNEXT:GOTO39Ø
400 POKECP,CH:ONINSTR(W3,A$)GOTO43Ø,44Ø,45Ø,46Ø,45Ø,46Ø
410 IFA$=CHR$(13)THEN42ØELSEPOKECP,ASC(A$):CP=CP+1:GOTO39Ø
420 XY=CP-1536Ø:Y=FIX(XY/64)*3+1:X=2*(XY-INT(XY/64)*64):GOTO32Ø
430 CP=CP+(CP>15423)*64:GOTO39Ø
440 CP=CP-(CP<16256)*64:GOTO39Ø
450 CP=CP+(CP>1536Ø)*1:GOTO39Ø
460 CP=CP-(CP<16319)*1:GOTO39Ø
470 L=Ø:GOTO58Ø
480 GOSUB6ØØ:PRINT@Q+64,"XXX";:GOSUB1ØØ:S=INSTR(X$,A$):IFSTHEN55
Ø
490 S=INSTR(X1$,A$):IFSTHEN55Ø
500 S=INSTR(CHR$(13)+CHR$(Ø8)+CHR$(24)+CHR$(91),A$):IFS=ØTHEN48Ø
ELSEGOSUB59Ø:ONSGOTO51Ø,52Ø,59Ø,53Ø
510 L=INT((L+16)/16)*16-1:GOTO56Ø
520 L=L+(L>Ø)*1:GOTO54Ø
530 L=L+(L>15)*16
540 S=27:GOSUB6ØØ:GOSUB61Ø:GOTO48Ø
550 GOSUB61Ø
560 L=L+1:IFL<8ØTHEN48Ø
570 DEFUSR=VARPTR(U(Ø)):J=USR(Ø):PRINT@768,W1:L=L-16
580 PRINT@96Ø,W1"SHIFT/BACKSPACE to Exit";:GOTO48Ø
590 PRINT@Q+64,"   ";:RETURN
600 Q=INT(L/16)*192+(L-INT(L/16)*16)*4:RETURN
610 FORY=1TO3:PRINT@Q+(Y-1)*64,T$(S,Y);:NEXT:RETURN
620 TL=Ø:C=1536Ø:PRINT@96Ø,W1"Enter 1 letter to identify program
";
630 A$=INKEY$:IFA$=""THEN63ØELSES=ASC(A$):IFS<65ORS>9ØTHEN63Ø
640 F$="TITLE"+A$+"/GFX":PRINT@96Ø,W1"LOCATING END OF DATA";:FOR
X=16319TOCSTEP-1
650 PRINT@988,X-C;:IF(PEEK(X)<>32ANDPEEK(X)<>128)THEN66ØELSENEXT
X:PRINT@896,W1"Screen is empty : TRY AGAIN";:FORD=1TO5ØØ:NEXT:GO
TO25Ø
660 B=X-C:L=INT(B/64):R=B-L*64:IFR=ØTHENR=64ELSEL=L+1
670 G=5:P(1)="1 CLS:CLEAR2ØØØ:READL:DIML(L),T$(L)"
680 P(2)="2 FORX=1TOL:READL(X):NEXT:FORX=1TOL:FORY=1TOL(X):READC
:T$(X)=T$(X)+CHR$(C):NEXTY,X"
690 P(3)="3 FORX=1TOL:PRINT@(X-1)*64,T$(X);:NEXTX":P(4)="4 DATA"
+STR$(L):P(5)="5 DATA"
700 FORX=1TOL:SB=C+(X-1)*64:G$(X)="":POKEVARPTR(G$(X))+2,INT(SB/
256):POKEVARPTR(G$(X))+1,SB-INT(SB/256)*256:POKEVARPTR(G$(X)),64
:NEXT
710 PRINT@96Ø,W1"Writing program";:FORX=1TOL:PRINT@976,W1;X;:FOR
Y=64TO2STEP-1:PRINT@98Ø,Y;:V$=MID$(G$(X),Y,1):IFV$=CHR$(32)THENN
EXTY
720 POKEVARPTR(G$(X)),Y:P(4)=P(4)+","+STR$(Y):FORZ=1TOY:TL=TL+1:
PRINT@984,USING"###";TL;:P(G)=P(G)+STR$(ASC(MID$(G$(X),Z,1)))+",
":IFLEN(P(G))>22ØTHENGOSUB76Ø:G=G+1:P(G)=STR$(G)+" DATA"
730 NEXTZ,X:GOSUB76Ø:K=G:G=3:GOSUB76Ø:S$="S":SN%=7:GOSUB79Ø
740 CLS:PRINT@256,"PROGRAM COMPLETE:
Program is      : "K"lines Numbered 1 TO"K"
Graphics data   : "TL"elements
Filespec        :  "F$
750 PRINT"
DUMPING PROGRAM :":OPEN"O",1,F$:FORX=1TOK:PRINT#1,P(X):NEXT:CLOS
E:PRINT@96Ø,"Hit any key";:GOSUB1ØØ:SN%=7:S$="R":GOSUB79Ø:GOTO25
Ø
760 P(G)=LEFT$(P(G),LEN(P(G))-1):RETURN
770 PRINT@96Ø,W1"Save as screen # <1-6>";:GOSUB1ØØ:SN%=INSTR("12
3456",A$):IFSN%THENS$="S":GOTO79ØELSE77Ø
780 PRINT@96Ø,W1"Recall screen # <1-6>";:GOSUB1ØØ:SN%=INSTR("123
456",A$):IFSN%THENS$="R"ELSE78Ø
790 DEFUSR=VARPTR(U(8)):IFS$="S"THENU(9)=1536Ø:U(11)=VARPTR(SS%(
(SN%-1)*48Ø))ELSEU(9)=VARPTR(SS%((SN%-1)*48Ø)):U(11)=1536Ø
800 J=USR(Ø):RETURN
810 DATA8448,15552,4352,1536Ø,256,768,-2Ø243,2Ø1
820 DATA8448,Ø,4352,Ø,256,96Ø,-2Ø243,2Ø1
830 CLS:CMD"DIR Ø":END
```

**** L2/16K   LVAR UTILITY ****

TRS-80/SYSTEM-80

```
ØØØØ1 ;       **LVAR=NAME**
ØØØØ2 ;
ØØØØ3 ;       BY TIM FISH
ØØØØ4 ;       9 CAVENDISH RD
ØØØØ5 ;       COLLIERS WOOD
ØØØØ6 ;       LONDON SW19 2ET
ØØØØ7 ;       ENGLAND
ØØØØ8 ;
```

```
00009 ;
00100          ORG     7E41H
00102 INIT     LD      A,0C3H  ;C3=JP OP
00104          LD      (418EH),A        ;ADRRESS OF "NAME" DOS EXI
T
00106          LD      HL,START
00108          LD      (418FH),HL
00110          JP      1A33H
00120 START    LD      BC,(40F9H)       ;START OF VLT
00122 NEXT     LD      A,(COUNT)
00124          CP      0
00126          JR      NZ,NOT15
00128 AGN      CALL    2BH
00130          OR      A
00132          JR      Z,AGN
00134          LD      A,15
00136 NOT15    DEC     A
00138          LD      (COUNT),A
00140          PUSH    BC
00142          POP     HL
00180          LD      DE,(40FBH)       ;END OF VLT+1
00200          SBC     HL,DE   ;TEST FOR END
00220          JR      Z,OUT
00240          INC     BC
00260          INC     BC
00280          LD      A,0DH   ;LINE FEED
00300          CALL    33H
00320          LD      A,(BC)
00340          CALL    33H
00360          DEC     BC
00380          LD      A,(BC)
00400          CALL    33H
00420          DEC     BC      ;POINT TO CODE LENGTH
00440          LD      A,(BC)
00460          LD      (40AFH),A
00480          CP      2       ;INTEGER?
00500          JR      NZ,NOTINT
00520 INT      LD      A,'%'
00540          CALL    33H
00560          LD      A,'='
00580          CALL    33H
00600          INC     BC
00620          INC     BC
00640          INC     BC
00660          LD      A,(BC)  ;VALUE MSB
00680          LD      (4121H),A        ;WRA1
00700          INC     BC
00720          LD      A,(BC)
00740          LD      (4122H),A
00760          LD      HL,(4121H)
00780          BIT     7,H     ;TEST FOR NEG VALUE
00800          JR      Z,POS
00820          LD      DE,0
00840          EX      DE,HL
00860          XOR     A       ;CLEAR CARRY
00880          SBC     HL,DE   ;TWOS COMPLIMENT IT
00900          LD      A,'-'
00920          CALL    33H
00940 POS      PUSH    BC
00960          CALL    0FAFH
00980          POP     BC
01000          INC     BC
01020 STEP     JR      NEXT
01040 OUT      HALT
01060 NOTINT   CP      04      ;SINGLE PRECISION?
01080          JR      NZ,NOTSNG
01100          LD      A,'='
01120          CALL    33H
01140          INC     BC
01160          INC     BC
01180          INC     BC      ;POINT  TO VALUE
01200          LD      D,4
01220          LD      HL,4121H
01240 LOOP1    LD      A,(BC)
01260          LD      (HL),A
01280          INC     HL
01300          INC     BC
01320          DEC     D
01340          JR      NZ,LOOP1
01360          LD      A,0     ;NO PRINT USING
01380          PUSH    BC
01400          CALL    0FBEH   ;CONVERT TO ASCII & STORE
01420          CALL    28A7H   ;PRINT IT
01440          POP     BC
01460 HALFWY   JR      STEP
01480 NOTSNG   CP      8       ;STRING?
01500          JR      NZ,STRING
01520          LD      A,'#'   ;MUST BE DBL
01540          CALL    33H
01560          LD      A,'='
01580          CALL    33H
01600          INC     BC
01620          INC     BC
01640          INC     BC
01660          LD      D,8
01680          LD      HL,411DH
01700          JR      LOOP1
01720 STRING   CP      3
01740          JR      NZ,OUT
01760          LD      A,'$'
01780          CALL    33H
01800          LD      A,'='
01820          CALL    33H
01840          LD      A,'"'
01860          CALL    33H
01880          INC     BC
01900          INC     BC
01920          INC     BC
01940          LD      A,(BC)
01960          PUSH    AF
```

```
Ø198Ø            INC     BC
Ø2ØØØ            LD      A,(BC)   ;MSB STRING ADDRESS
Ø2Ø2Ø            LD      L,A
Ø2Ø4Ø            INC     BC
Ø2Ø6Ø            LD      A,(BC)
Ø2Ø8Ø            LD      H,A
Ø21ØØ            POP     AF
Ø212Ø            CP      Ø
Ø214Ø            JR      Z,SKIP   ;IF NULL STRING
Ø216Ø            PUSH    BC
Ø218Ø            LD      B,A
Ø22ØØ LOOP2      LD      A,(HL)
Ø222Ø            CALL    33H
Ø224Ø            INC     HL
Ø226Ø            DJNZ    LOOP2
Ø228Ø            POP     BC
Ø23ØØ SKIP       INC     BC
Ø232Ø            LD      A,'"'
Ø234Ø            CALL    33H
Ø236Ø            JR      HALFWY
Ø238Ø COUNT      DEFB    15
Ø24ØØ            END     INIT


START   END   ENTRY
7E41    7F2C 7E41


7E41:   3E C3 32 8E 41 21 4F 7E 22 8F 41 C3 33 1A ED 4B
7E51:   F9 4Ø 3A 2C 7F FE ØØ 2Ø Ø8 CD 2B ØØ B7 28 FA 3E
7E61:   ØF 3D 32 2C 7F C5 E1 ED 5B FB 4Ø ED 52 28 4A Ø3
7E71:   Ø3 3E ØD CD 33 ØØ ØA CD 33 ØØ ØB ØA CD 33 ØØ ØB
7E81:   ØA 32 AF 4Ø FE Ø2 2Ø 32 3E 25 CD 33 ØØ 3E 3D CD
7E91:   33 ØØ Ø3 Ø3 Ø3 ØA 32 21 41 Ø3 ØA 32 22 41 2A 21
7EA1:   41 CB 7C 28 ØC 11 ØØ ØØ EB AF ED 52 3E 2D CD 33
7EB1:   ØØ C5 CD AF ØF C1 Ø3 18 99 76 FE Ø4 2Ø 2Ø 3E 3D
7EC1:   CD 33 ØØ Ø3 Ø3 Ø3 16 Ø4 21 21 41 ØA 77 23 Ø3 15
7ED1:   2Ø F9 3E ØØ C5 CD BE ØF CD A7 28 C1 18 D9 FE Ø8
7EE1:   2Ø 14 3E 23 CD 33 ØØ 3E 3D CD 33 ØØ Ø3 Ø3 Ø3 16
7EF1:   Ø8 21 1D 41 18 D5 FE Ø3 2Ø BF 3E 24 CD 33 ØØ 3E
7FØ1:   3D CD 33 ØØ 3E 22 CD 33 ØØ Ø3 Ø3 Ø3 ØA F5 Ø3 ØA
7F11:   6F Ø3 ØA 67 F1 FE ØØ 28 ØA C5 47 7E CD 33 ØØ 23
7F21:   1Ø F9 C1 Ø3 3E 22 CD 33 ØØ 18 B1 ØF
```

#### MODEL 3   SOURCE UTILITY ####

TRS-8Ø

```
1Ø  REM             SOURCE/BAS
    EDTASM SOURCE-TAPE UTILITY FOR MODEL III NEWDOS8Ø V2.Ø
              (copyright  1982  T. Domigan)
2Ø POKE&H4ØB1,&HØØ:POKE&H4ØB2,&H8Ø:POKE&H4Ø7F,PEEK(&H4ØAØ)
3Ø CLS:CLEAR5Ø:DEFINTA-Z:CP=&H4Ø23:CC=PEEK(CP):POKECP,32
4Ø PRINT@72,"EDTASM ASSEMBLER SOURCE UTILITY FOR MODEL III"
5Ø PRINT TAB(19);"NEWDOS8Ø Version 2.Ø"
6Ø PRINTTAB(15);"( Copyright 1982 T. Domigan )":GOSUB47Ø
7Ø DEFUSRØ=&H4Ø4E:DEFUSR1=&H4Ø7Ø:BU=&H8ØØØ:MD=&H4Ø56
8Ø POKE&H4Ø24,&HØ1:POKE&H421Ø,&H28:POKE&H4214,&HØ4
9Ø H$=CHR$(244)+CHR$(245)+CHR$(246)+CHR$(32)
1ØØ CLS:PRINT:PRINTTAB(29);"MENU"
11Ø PRINT:PRINT"                1. DISK FILE TO MEMORY BUFFER
                2. CASSETTE FILE TO MEMORY BUFFER
                3. MEMORY BUFFER TO CASSETTE FILE
                4. MEMORY BUFFER TO DISK FILE"
12Ø PRINT"          5. CLEAR MEMORY BUFFER
                6. EXIT PROGRAM AND REPAIR BASIC"
13Ø GOSUB46Ø
14Ø IF(EQ<1)OR(EQ>6)THENGOTO13ØELSEIF(EQ<6)THEN17Ø
15Ø POKE&H4214,&HØØ:POKECP,CC:POKE&H4ØB1,&HFF:POKE&H4ØB2,&HFF
16Ø POKE&H4ØAØ,PEEK(&H4Ø7F):POKE&H4ØA1,&HFF:CLEAR:CLOSE:CLS:END
17Ø ONEQGOTO18Ø,24Ø,3ØØ,35Ø,43Ø
18Ø ME=BU:CLS:PRINT@398,"DISK  FILE  TO  MEMORY  ROUTINE"
19Ø PRINT@582,"Enter Filespec ( with Extension ) ==> ";
2ØØ LINEINPUTFS$:OPEN"R",1,FS$,1:PRINT@72Ø,"OPENING FILE ";H$;FS
$
21Ø FIELD1,1ASA$
22Ø FORI%=1TOLOF(1):GET1,I%:Y=ASC(A$):ME=ME+1:POKEME,Y:NEXTI%
23Ø CLOSE:PRINT@855,"END OF FILE":GOTO29Ø
24Ø CLS:PRINT@398,"CASSETTE  FILE  TO  MEMORY  ROUTINE"
25Ø PRINT@59Ø,"Press ENTER when cassette is ready":GOSUB46Ø
26Ø POKEMD,15Ø:POKEMD+2,2Ø5:POKEMD+3,53:POKEMD+4,2:POKEMD+5,119
27Ø X=USRØ(P)
28Ø PRINT@845,"Cassette file has been READ to memory"
29Ø FORT=1TO1ØØØ:NEXTT:GOTO1ØØ
3ØØ CLS:PRINT@398,"MEMORY  TO  CASSETTE  FILE  ROUTINE"
31Ø POKEMD,135:POKEMD+2,126:POKEMD+3,2Ø5:POKEMD+4,1ØØ:POKEMD+5,2
32Ø PRINT@59Ø,"Press ENTER when cassette is ready":GOSUB46Ø
33Ø X=USRØ(P)
34Ø PRINT@847,"Cassette file has been WRITTEN":GOTO29Ø
35Ø CLS:PRINT@398,"MEMORY  TO  DISK  FILE  ROUTINE"
36Ø PRINT@585,"Enter Filespec ( with Extension ) ==> ";
37Ø LINEINPUTFS$:OPEN"O",1,FS$:SM=BU:SO=BU+1
38Ø PRINT@722,"OPENING FILE ";H$;FS$
39Ø S1=PEEK(SM):S2=PEEK(SO):PRINT#1,CHR$(S2);
4ØØ IF(S2<>26)THENGOTO42ØELSEIF(S1=13)THENCLOSE
41Ø PRINT@855,"END OF FILE":GOTO29Ø
42Ø SM=SM+1:SO=SO+1:GOTO39Ø
43Ø CLS:PRINT@4ØØ,"CLEAR  BUFFER  ROUTINE"
44Ø Y=USR1(Q)
45Ø PRINT@721,"BUFFER IS NOW CLEAN":GOTO29Ø
46Ø EQ$=INKEY$:IFEQ$=""THEN46ØELSEEQ=VAL(EQ$):RETURN
47Ø FORDT=&H4Ø4ETO&H4Ø7E:READD:POKEDT,D:NEXTDT:RETURN
48Ø DATA2Ø5,66,48,33,1,128,243,2Ø5,Ø,2,Ø,Ø,Ø,Ø,35,254
49Ø DATA 26,32,247,43,43,126,254,13,4Ø,4,35,35,24,236
5ØØ DATA2Ø5,248,1,2Ø1,33,1,128,17,2,128,1,Ø,112
51Ø DATA62,Ø,119,237,176,2Ø1
```

NEXT MONTH'S ISSUE

Next month's issue will contain at least the following programs plus the usual features and articles. An (80) after a program title indicates that the program will be for TRS-80 Model 1/3 or System 80/Video Genie. A (CC) indicates that the program will be for the TRS-80 Colour Computer and (HP) that the program is for the Hitachi Peach.

CRICKET (CC)

Join in the Summer fun and play your own World Series Cricket on your COCO. Complete with batsmen, bowler and fielders. A game for two players.

ALIEN CHASE (HP)

Another "get them before they get you" game for Peach users. You pursue the Aliens around the screen and are in turn pursued by them.

AUTOMATIC DIRECTORY (80) — 32K DISK

Some of the newer DOS's have a facility to speed up file manipulation from the Directory. AUTOMATIC DIRECTORY gives you this facility from earlier DOS's. You may KILL, LOAD or LIST a file simply by placing the cursor against that file name on the DIRectory display and pressing the appropriate key. In addition, you may assign keys to particular files so you may load such a file with a single keystroke.

DISK DIRECTORY RECORDER (MODEL 3)

About the time you start on your second box of diskettes, you run into the problem of keeping track of all those files. It seems a shame to use pen and paper to do this when you have a perfectly good computer there. Disk Directory recorder stores a sorted catalogue of all files showing the name of each file, its extensions and the name of the disk on which it may be found. It is thus a simple matter to update your catalogue as you add and delete new files.

FILM COSTING (80) L2/16K

Whilst we do not expect too many of our readers are involved in processing large quantities of photographic film, this program which calculates processing costs does illustrate some interesting programming points and could probably be adopted to a variety of similar uses.

CASSETTE/DISK EDITION INDEX

The cassette edition of MICRO-80 contains all the applicable software listed each month, on cassette. For machine language programs copies of both the source and object file are provided. All programs are recorded twice. Level 1 programs can only be loaded into a Level 2 machine if the 'Level 1 in Level 2' program from the MICRO-80 Software Library — Vol. 1 is loaded first.

***Note:** System 80/Video Genie computers have had different tape-counters fitted at different times. The approximate start positions shown are correct for the very early System 80 without the volume control or level meter. They are probably incorrect for later machines. The rates for a cassette subscription are printed on the inside front cover of each issue of the magazine.*

The disk edition contains all applicable programs which can be executed from disk. Level 1 disk programs are saved in NEWDOS format. Users require the Level 1/CMD utility supplied with NEWDOS+ or NEWDOS 80 version 1.0 to run them.

				Approx. Start Position		
Side 1	**Type**	**I.D.**	**Disk Filespec**	**CTR-41**	**CTR-80**	**System 80**
GRAFX INIT PROG	32K DISK	I	INIT/BAS	18	10	6
GRAFX INIT PROG	32K DISK	I	INIT BAS	47	26	11

APPLICATION FOR PUBLICATION OF A PROGRAM IN MICRO-80

Date ....

To **MICRO-80**
SOFTWARE DEPT.,
P.O. BOX 213,
GOODWOOD, S.A. 5034

Please consider the enclosed program for publication in MICRO-80.

Name ....

Address ....

....

Postcode ....

***** CHECK LIST *****

Please ensure that the cassette or disk is clearly marked with your name and address, program name(s), Memory size, Level I, II, System 1 or 2, Edtasm, System, etc. The use of REM statements with your name and address is suggested, in case the program becomes separated from the accompanying literature.

Ensure that you supply adequate instructions, notes on what the program does and how it does it, etc.

For system tapes, the start, end, and entry points, etc.

The changes or improvements that you think may improve it.

Please package securely — padabags are suggested — and enclose stamps or postage if you want your cassette or disk returned.

GRAFX	32K DISK	G	GRAFX/BAS	74	41	19
GRAFX	32K DISK	G	GRAFX/BAS	138	77	41
AUSTRALIA'S CUP	L2/16K	A	AUSCUP/BAS	180	101	56
AUSTRALIA'S CUP	L2/16K	A	AUSCUP/BAS	269	151	87
LVAR UTILITY	SYSTEM	LVAR	LVAR/CMD	348	196	122
LVAR UTILITY	SYSTEM	LVAR	LVAR/CMD	353	199	122
LVAR UTILITY	EDTASM	LVAR	LVAR/EDT	359	202	128
LVAR UTILITY	EDTASM	LVAR	LVAR/EDT	381	215	136
SOURCE UTILITY	MODEL 3	S	SOURCE/BAS	403	227	148
SOURCE UTILITY	MODEL 3	S	SOURCE/BAS	422	238	160
Side 2						
HI RES WRITER 1.1	COCO EDTASM	HIRES	—	18	10	—
HI RES WRITER 1.1	COCO BINARY	HIRES	—	251	141	—
HI RES WRITER 1.1	COCO BINARY	HIRES	—	307	173	—
TRACK RACER	HITACHI PEACH	TRACK	—	352	198	—
TRACK RACER	HITACHI PEACH	TRACK	—	364	205	—
		DECEMBER				
Side 1						
YAHTZEE	MOD 3/BASIC	Y	YAHTZEE/BAS	18	10	6
YAHTZEE	MOD3/BASIC	Y	YAHTZEE/BAS	101	58	39
BOLD PRINTING	L2/16K	B	BOLD/BAS	178	101	68
BOLD PRINTING	L2/16K	B	BOLD/BAS	188	107	72
SPACE UTILITY	SPACE	SPACE	SPACE/CMD	200	112	75
OBJECT CODE	SPACE	SPACE	SPACE/CMD	210	115	77
SPACE UTILITY	SPACES	SPACES	SPACE/EDT	220	120	81
SOURCE CODE	SPACES	SPACES	SPACE/EDT	260	144	97
SPACE UTILITY	L2/16K	SP16K	—	300	166	112
OBJECT CODE	L2/16K	SP16K	—	308	170	114
HOUSEHOLD ACCOUNTS						
MODULE 1	MOD4/DISK	1	MODULE1/BAS	316	176	—
MODULE 2	MOD4/DISK	2	MODULE2/BAS	336	187	—
MODULE 3	MOD4/DISK	3	MODULE3/BAS	352	196	—
MODULE 4	MOD4/DISK	4	MODULE4/BAS	370	206	—
MODULE 5	MOD4/DISK	5	MODULE5/BAS	398	222	—
MODULE 6	MOD4/DISK	6	MODULE6/BAS	413	231	—
MODULE 7	MOD4/DISK	7	MODULE7/BAS	444	249	—
Side 2						
HOUSEHOLD ACCOUNTS MODULE 8	MOD4/DISK	8	MODULE8/BAS	18	10	—
SIRIUS ADVENTURE	PEACH	SIRIUS	—	51	30	—
HOUSEHOLD ACCOUNTS	PEACH	ACCTS	—	159	92	—
KILLER SATELLITE	C.C.	KILLER	—	280	162	—
KILLER SATELLITE	C.C.	KILLER	—	293	170	—
SIRIUS ADVENTURE	C.C.	SIRIUS	—	308	180	—
SIRIUS ADVENTURE	C.C.	SIRIUS	—	342	200	—

TO:
**MICRO-80, P.O. BOX 213, GOODWOOD,
SOUTH AUSTRALIA. 5034.**

Please RUSH to me the items shown below:

$ enclosed Date ....

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.... 12 mth. subs. to MICRO-80, plus the disc edition

.... The latest issue of MICRO-80 (see inside front cover for prices)

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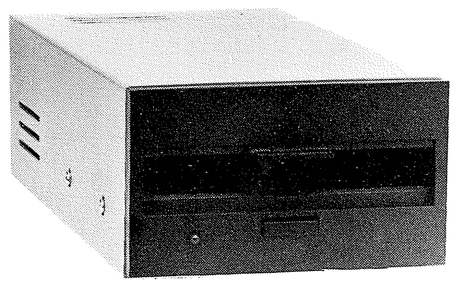

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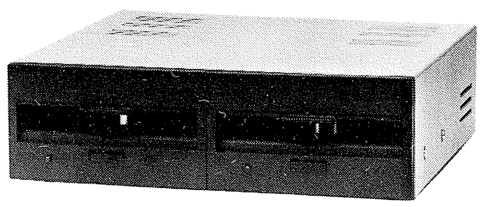

DUAL DRIVE PACKAGE ***from ...*** **$874**

Bigger volume means lower cost price, which we are passing on to you. Avoid the annoying bundle of cables, wires and separate boxes. MICRO-80 is now offering our well-proven MPI disk drives in attractive, self-contained single or dual-drive cabinets complete with internal power supply. Our drive Ø and dual-drive packages also include the appropriate version of DOSPLUS and dual-drive cable.

The best news of all is the specially reduced package prices ...
SAVE $23 — $107 over our already low prices!

Choose the appropriate system from the table below:

DRIVE TYPE	No. of Tracks	No. of Heads	Capacity	Dosplus Version	Price	* Saving
DRIVE Ø						
1 x MPI B51	40	1	100K	3.4	$499	$137.95
1 x MPI B52	40	2	200K	3.4	$639	$97.95
1 x MPI B92	80	2	400K	3.4	$799	$107.95
DRIVE 1						
1 x MPI B51	40	1	100K	—	$415	$33.00
1 x MPI B52	40	2	200K	—	$525	$23.00
1 x MPI B92	80	2	400K	—	$695	$23.00

*Represents the saving compared with buying all the items included in the package separately

•Drive Ø package includes one bare disk drive, self-contained single-drive cabinet/power supply as illustrated, two drive cable and the version of DOSPLUS indicated.

•Drive 1 package includes one bare disk drive and self-contained single-drive cabinet/power supply as illustrated.

If it's a dual-drive system you need, then take advantage of our dual-drive package and
SAVE a further $40 on the price of two single-drive packages ...

DRIVE TYPE	No. of Tracks	No. of Heads	Capacity	Dosplus Version	Price
2 x MPI B51	40 ea	1 ea	2 x 100K	3.4	$874
2 x MPI B52	40 ea	2 ea	2 x 200K	3.4	$1125
2 x MPI B92	80 ea	2 ea	2 x 400K	3.4	$1454

Dual-drive package includes two bare disk drives, self-contained dual-drive cabinet/power supply as illustrated, two drive cables and the version of Dosplus indicated.

NOTE: All 40 track drives are completely compatible with 35 track operating systems such as TRSDOS. DOSPLUS allows you to realise an additional 14% capacity compared with TRSDOS. Under DOSPLUS 3.4, 80 track drives can read 35/40 track diskettes.

All disk drive components are still available separately:

BARE DRIVES — MPI drives offer the fastest track-to-track access time (5 milliseconds) available. All drives are capable of operating in double density for 80% greater storage capacity.

	Price	Freight
MPI B51 40 track, single-head, 100K	$349	$5.00
MPI B52 40 track, dual-head, 200K	$449	$5.00
MPI B92 80 track, dual-head, 400K	$619	$5.00
Separate, dual-drive power supply	$85	
Self-contained, single drive cabinet/power supply	$99	$5.00
Self-contained, dual-drive cabinet/power supply	$135	$5.00
Two drive cable	$39	$2.00
Four drive cable	$49	$2.00

Prices are FOB Adelaide. Add $5.00 freight for single drive package, $10.00 for dual-drive package. Prices are in Australian dollars. Freight is road freight anywhere in Australia.

All items carry a 90-day parts and labour warranty. Repairs to be carried out in our Adelaide workshops.