

ATARI

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Graphics

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explained

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...and more

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GRID



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PAGE 6

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Page 6 is a users magazine and relies
entirely on readers' support in submitting
articles and programs. The aim is to
explore Atari computing through the
exchange of information and knowledge
and what we learn, unfortunately, often
for articles submitted, we hope that you
will gain satisfaction from seeing your
work published and in turn we hope
that you will learn from articles submitted
by other readers.

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ISSUE 11

September/October 1984

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A NEW DAWN?

This issue's Editorial was to have been a criticism of Atari's continuing lack of support for their computers prompted by a press release which started "Long live the 'video game!'" but of course everything has now changed. What was Atari policy is no longer Atari policy. By the time you read this, Atari's new path will have been charted and let us all hope that this time they are heading in the right direction.

For those of you who do not read the U.K. micro magazines, all of this has to do with the take-over of Atari by Jack Tramiel, founder and ex-President of Commodore. In fact, even if you do read the micro magazines, you may not have learned much as the take-over was covered much more extensively in the Financial Times, but then the U.K. computer press has never taken much interest in Atari. Maybe now that will all change.

Many Atari owners seem to have taken events as the toll of doom for Atari, as the throwing away of a great computer to the opposition, but I think that Atari owners may now be well and truly on the verge of a new dawn. A dawn that will finally bring true recognition of the fact that Atari has always produced the finest computer on the market. I hope that in saying this I don't follow *Computal's* unfortunate classic of bad timing when they published, in their July issue, an interview with James Morgan on the future of Atari. By the issue date, James Morgan was no longer CEO of Atari and the whole structure of the company had changed! Such are the perils of writing copy in advance. I have no doubt that much more will develop between my writing this and publication.

Every reader who has stayed loyal to Atari computers for any length of time must have realised that Atari was slowly sinking into obscurity, still riding the VCS wave, still failing to realise what a great computer system they had and still misunderstanding the U.K. market. Despite all the promise nothing had really changed by mid-summer and with plans to launch a new video game system in the autumn, which would compete with their own computers, the future for the computer side of Atari in the U.K. looked even bleaker. Warner Bros had been talking to Phillips for some time but in the end they made what was perhaps one of their wisest decisions since buying Atari, they sold the company to the man that more than any other, outside Atari, put Atari in the sorry position it was in.

Jack Tramiel founded and built Commodore and he put Commodore at the forefront of home computing. Not only did he put Atari in the shadows, he completely eclipsed them and not once did he mention a video games machine. He was offered the arcade machine side of Atari but turned it down and has been quoted as saying that the video game machine is dead, which leaves us with a company that we have all wanted all along - a company totally dedicated to the home computer. At the time of writing, reports from the U.S. state that the workforce had been reduced to 200 and the price of the 800XL dropped from \$250 to \$150 to bring it in direct competition with Commodore. U.K. prices were expected to drop to £199.99 for the 800XL and £99.99 for the 600XL. Mr Tramiel is said to have plans to drop the VCS entirely 'within six months' and to introduce a computer to compete with the Apple II. He is also said to be considering, for next year, a direct competitor for Apple's Macintosh. All of which seems to be the direction in which we would all like Atari to go.

Atari have always had superb products but they have in the past lacked understanding of both their own products and marketing in general. Jack Tramiel has proved with Commodore that he fully understands the marketing of home computers and he now has the opportunity to marry one of the best marketing strategies in the business with the best products. It won't be so easy this time round because Commodore won't make it as easy for Atari as Atari made it for Commodore but it promises to be the most exciting time since the early days when Atari took the home computer world by storm.

If Atari had stayed with Warner Bros, those of us who have remained loyal would probably have witnessed the end of a dream. It may still happen but I think not. Atari is dead, long live Atari!

On a personal note, please be patient if you find any delays between now and issue 12 on anything ordered or if the next one is a few days late. A new Atari fanzine is due to be born on 27th September - right in the middle of the typesetting preparation for the next issue!

Leo Ellingham

Editor

News and New Products

Over the summer the micro-world hibernates. You stop buying software and software producers have so few new products. Spectrum programmers jet off to the Bahamas whilst Atari programmers have to take holiday jobs to survive another year. All of which means that news and new products are thin on the ground.

Hottest news of a hot July is of course the take-over of Atari but it is all happening too close to copy date to report anything specific. Expect big price reductions on hardware and software and the BOOK, as the only machine to survive into the autumn.

English Software has **STRANDED** out, a 35 screen graphic adventure in 32K. **ATTACK OF THE MUTANT CAMELS** from Liamssoft brings (hopefully) a new range of top class arcade games at amazing prices (see review).

In the States (info courtesy of The Poky Press), MUSE SOFTWARE should be releasing **BEYOND CASTLE WOLFENSTEIN** and PARKER BROS should have **FROGGER II: THREEDEEP** and **MONTEZUMA'S REVENGE**, an action adventure featuring 'Panama Joe' and a 100 room maze to investigate. Also **STAR WARS: THE ARCADE GAME** and **GYRUS**.

A couple of items received for review recently deserve mention. Firstly a **RUBBER KEYBOARD** from **FILESIXTY** which looks to be a very handy piece of equipment for 400 owners. Secondly **AUTOTECH** from **Magical Electronic Services** which is a write-protect/enable switch to attach to the 810 requiring no soldering. Looks excellent. Both of these arrived too late for reviews in this issue but full reports will follow.

Rumours from England ... a disk drive at under £200 made over here to an American design ... a reliable independent recorder at under £30 ... a cassette interface allowing a normal stereo recorder to be used ... an interface for a modem ... and, finally, an advertising campaign from Atari (please!)

Since the magazine increased in size a couple of issues ago the postage costs have increased considerably. We have tried to absorb these costs but with U.K. postage due to increase in September we are forced to increase the subscription price. If you work it out we still don't pass on the full cost of post and packing and we hope that we continue to receive your subscription support. You still get six issues of PAGE 6 for less (in most cases) than one piece of software.

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Readers Letters

AN EDITOR REPLIES

Dear PAGE 6,

In issue 8, Mr B. of Herts encourages Atari owners to write to magazines and software houses asking for more (and better) support. "Your voice does count", he exclaims. He is right. Editors have only a hazy idea what their readers want, but are in the business of trying to supply it. All feedback makes an impact.

In my own magazine, Practical Computing, we regularly publish a lot of material for the Research Machines RML 3802. This is because lots of teachers read Practical Computing, they send in lots of well-written material and we publish it. It is not because the 3802 is an enormous seller.

As an Atari owner myself, I want Practical Computing to cover the Atari as well as possible. This includes fairly regular games reviews and an "Open File" program section, but (a) we very rarely get sent programs for review, except by Atari and English Software - we never get sent the expensive American imports. Also (b) the number of short, usable readers programs sent in is fairly small. The Sharp and Research Machines micros do better, as well as all the obvious ones!

Magazines usually beg, borrow or buy the machines they need to run software, we have over a dozen. Some manufacturers help with long term loans and Commodors, for example, sells 64's to journalists at half price. When the staff have machines, software and readers programs to run, they tend to get to know

those micros better than others and the bandwagon starts to roll...

Don't blame the magazines for their ignorance of Atari. Follow Mr B's advice, get out your keyboards or pens and start writing!

Jack Schofield
Editor
Practical Computing

THE COMPUTER JUNGLE?

Dear PAGE 6,

Computer terminology is baffling enough but for Atari owners it is getting worse.

Imagine hearing someone say "I have my Gorilla Banana tied to an Ape-Face and use Elephants in my Ram". Maybe Jungle Book should be required reading instead of the Basic Manual!

Alan Hollis
BPPD 40

BLEEP

Dear Sirs,

Here is a tip that newer owners may not know.

When loading or saving a program press CTRL and 2 together and when the cassette has finished the computer will bleep at you to let you know that it has finished. Much better than sitting watching an empty screen.

Kevin Ramshaw
Tyme & Wear

GOING DUTCH

Dear Lee,

With the introduction of the Atari home computers in the Dutch market, the moment has arrived to found an Atari Users Group (and the initiative has been taken by three 'founding fathers' who are members of MCC, the large Dutch Hobby Computer Club.

The User Group is now being constituted within the framework of MCC and Dutch and Flemish readers of this journal are invited to get in touch with Nic Oosterbeek, Raadhuisaan 114, Voorschoten, The Netherlands, phone 01717-2885. Also there is a MCC-Belgium and we would welcome hearing from French-speaking members of that organisation as well as anyone interested in our work. At the time of writing we have about thirty members half of whom are more or less able to read English and several who read and write French.

Authors of published and unpublished programs are invited to send us their material for inclusion in our library and possible Dutch translation. Apart from our recognition we shall endeavour to repay you in kind with disks or cassettes of suitable material.

Nic Oosterbeek
Holland

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Listing Conventions

The program listings in PAGE 6 are prepared so that the listings match exactly what you see on a normal 38 column screen. Inverse video and CONTROL characters appear as they do on the screen.

To obtain CTRL characters use the keys shown in the following chart.

| Normal Video | TYPE THIS | Inverse Video |
|--------------|-----------|---------------|
| • | CTRL . | ◊ |
| ◊ | CTRL Δ | ◊ |
| ◊ | CTRL 0 | ◊ |
| ◊ | CTRL C | ◊ |
| ◊ | CTRL D | ◊ |
| ◊ | CTRL E | ◊ |
| ◊ | CTRL F | ◊ |
| ◊ | CTRL G | ◊ |
| ◊ | CTRL H | ◊ |
| ◊ | CTRL I | ◊ |
| ◊ | CTRL J | ◊ |
| ◊ | CTRL K | ◊ |
| ◊ | CTRL L | ◊ |
| ◊ | CTRL H | ◊ |
| ◊ | CTRL N | ◊ |
| ◊ | CTRL O | ◊ |
| ◊ | CTRL P | ◊ |
| ◊ | CTRL Q | ◊ |
| ◊ | CTRL R | ◊ |
| ◊ | CTRL S | ◊ |
| ◊ | CTRL T | ◊ |
| ◊ | CTRL U | ◊ |
| ◊ | CTRL V | ◊ |
| ◊ | CTRL W | ◊ |
| ◊ | CTRL X | ◊ |
| ◊ | CTRL Y | ◊ |
| ◊ | CTRL Z | ◊ |
| ◊ | CTRL _ | ◊ |
| ◊ | CTRL : | ◊ |
| ◊ | CTRL ; | ◊ |
| ◊ | SHIFT = | ◊ |

| | | |
|---|-----------------|---|
| ◊ | ESC ESC | ◊ |
| ◊ | ESC CTRL _ | ◊ |
| ◊ | ESC CTRL = | ◊ |
| ◊ | ESC CTRL + | ◊ |
| ◊ | ESC CTRL - | ◊ |
| ◊ | ESC SHIFT 0 | ◊ |
| ◊ | ESC DEL | ◊ |
| ◊ | ESC TAB | ◊ |
| ◊ | ESC SHIFT DEL | ◊ |
| ◊ | ESC SHIFT 0 | ◊ |
| ◊ | ESC CTRL TAB | ◊ |
| ◊ | ESC SHIFT 0 | ◊ |
| ◊ | ESC CTRL Z | ◊ |
| ◊ | ESC CTRL DELETE | ◊ |
| ◊ | ESC CTRL 0 | ◊ |

Make sure that you SAVE a copy of any listing before you attempt to RUN it.

Review

BARGAIN TIME

THREE FROM P.F. SOFTWARE

In last issue's editorial I mentioned that there were a number of low-price programs around which quite frankly put you off from responding to advertisements but I also said that there were some excellent programs available. The problem is how do you know which is which?

With the above in mind I decided to take a look at three programs from P.F. Software which range in price from £2.50 to £4.50 and you won't get much cheaper than that! Most owners do not realise that Atari software generally sells only in small quantities and the cost of fancy packaging and advertising often means that selling software at low prices is not feasible. Forget the thoughts of the idle rich Atari programmer, it is simply not true! In order to sell at such low prices, P.F. Software have cut right back on the packaging to the extent that you get a typed label and photocopied instructions. You may be dismayed initially at having spent even £2.50 but it is the programs themselves that count, so are they worth it?

The first of the trio at £2.50 is **Blackjack** which is the standard game of pommoo using the joystick to twist or stick and play against the dealer. A very familiar game that has almost become a computer standard by now but this version uses excellent high-resolution graphics in four colours and knocks Atari's own **Blackjack** for six. Especially impressive are the court cards with good design and plenty of colour. It really does look like a pack of cards on the screen. Against the £9.95, or whatever, that Atari charge for a very basic program this is undoubtedly worth every penny of £2.50!

Secondly, for those of you who are budding artists but do not have a disk drive or cannot afford **MicroPainter** or **Paint** comes **Art Atari** which is a drawing utility enabling you to create screen pictures and save them to cassette. It obviously lacks the sophistication of the **MicroPainter** type utility but it does allow you to compose pictures in up to 80 colours and has the usual line, draw and fill functions. The different colours are achieved by using variable display list interrupts and although there are some limitations on how the colours are used, with careful planning some superb hi-res pictures can be composed. Generally you will need only a dozen or so colours in any given drawing and

the results that can be obtained are very impressive. Included on the tape is a demo picture which is copied from an original drawn with **MicroPainter** and whilst **Art Atari** is not so easy to use, the end result is just as impressive. If you are looking for a drawing utility but are not sure whether you can get on with one, **Art Atari** will get you started for very little cost. You can always go on to **MicroPainter** afterwards. Far better than spending £30 and finding that you don't like drawing programs after all!

To my mind, the best of the three is **Picture Puzzle**. I was amazed at the quality and the program will give you many hours of enjoyment if you like the 'sliding squares' type of puzzle. If you have young children then the program will be of extra value for the easier levels are ideally suited to young minds. **Picture Puzzle** is very similar to the range put out by Thom EMI some time ago and consists of a high resolution picture which is scrambled up and then needs to be re-arranged to the original using the joystick. There are five difficulty levels and each picture can be divided into 16, 20, 25 or 40 pieces. As the difficulty level increases the pieces are more jumbled and on level 5 the screen is blanked while the pieces are moved. Choose this level and forty pieces and you could be in for a long night! At the opposite end on level one and using only 16 pieces, the program is ideally suited to young children who, maybe with a little help, can easily re-arrange the picture and will gain a lot of pleasure in putting it back together again. There are two pictures to choose from and the quality of both and of the program in general is very good. If you like picture puzzles you will probably consider your £3.50 well spent.

P.F. Software is obviously a 'home base' company putting out some well written software at pocket money prices. You don't get fancy packaging and fancy protection techniques and these are not of the top American (and now British) standards but a great deal of care has gone into making the programs presentable, and you are not being asked to pay fancy prices.

Blackjack and **Art Atari** come on 16K cassette and **Picture Puzzle** requires 32K. ●

48K Spectrum & Atari 400/600/800



Blue Thunder by Richard Wilcox

Richard Wilcox Software

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GRID

by Mark Hewson

REQUIRES 32K

Grid is a two player game requiring the use of two joysticks. After a lengthy initialisation (approx. 50 seconds) a grid appears and the players are offered a choice of four game options. The desired option is selected by pressing the trigger button as the option lights up.

The object of the game is to outscore your opponent by placing your coloured pieces strategically to either gain high scores yourself or to stop your opponent from obtaining a high score.

Scoring is carried out in four directions.

1. Top to bottom
2. Top left to bottom right
3. Bottom left to top right
4. Left to right

The scoring procedure is difficult to explain but the following examples should help.



Top to bottom 0
 Top left to bottom right 0
 Bottom left to top right 0
 Left to right 2
 Total 2



Top to bottom 2
 Top left to bottom right 0
 Bottom left to top right 0
 Left to right 2
 Total 4



Top to bottom 2
 Top left to bottom right 2
 Bottom left to top right 0
 Left to right 2
 Total 6



Top to bottom 2
 Top left to bottom right 2
 Bottom left to top right 3
 Left to right 3
 Total 10

No score is allowed for one piece on its own in any direction. The best way to become familiar with the scoring routine is to play a few games and study the grid carefully.

There are several "Mystery Squares" and if you place your piece on these there is an even chance of either doubling your score or scoring no points for that move. In the "Tricky" version of the game Mystery Squares have an additional function. If you choose a "no score" square not only do you score zero for the move but your opponents piece will be placed on the square. "Tricky" games have red question marks over the Mystery squares and Normal games have green question marks.

I am indebted to ANTIC magazine - Volume 2 Issue 3 - for the machine code Player Move routine.

```

20 000 *****
21 000 *          *
22 000 * a two player strategy game *
23 000 *          *
24 000 *      NAME GRID      *
25 000 *****
26 000
27 00 01 0000 000 000 0
28 01 00 0000 00 0100 100 0100 000
29 000 *****
30 00 0000 0000 010 0100000000 1
31 0000 0000
32 00 0000 00000000 0000 011
33 0000 000 000000 0000
34 0000 000 000000 0000
35 00 0000 0000
36 00 0000 0000
37 00 0000 0000 0000 0000 000 0
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☆ NEW ☆

COMPETITION PRIZE

▼▼▼

Remember the competition in Issue 9 for a game built around a scrolling demo? Well, one or two of you did but that is all. The response has been quite disappointing so in a final attempt to prove that the widely held belief that Atari owners can only play games and not write them is a myth, we have, through devious (though entirely legal) means, got hold of AN ATARI TOUCH TABLET to give away as first prize! Not only that but each of the five runners up (if there are that many) will receive assorted items of software. There is no excuse for you not entering this competition. The Atari Touch Tablet is a brilliant piece of equipment.

The competition is being widened to include any scrolling game, not necessarily built around the demo in Issue 9 but that will certainly get you started. One catch is that you have only a couple of weeks to finish your masterpiece and get it here as all entries must be received by 24th September. The winning entry will be published in Issue 12.

There are a few rules for this revised competition:

1. PAGE 6 reserves the right to publish any prize winning entry but does not claim any copyright. All published material will be considered public domain.
2. Entries should not be sent or used elsewhere until the winner is announced. After that you are free to use your program as you wish.
3. All entries so far submitted will be eligible for the new prize.

Rules are pretty boring so there aren't any more. We rely on you to be sensible and fair. After all we are giving someone an Atari Touch Tablet and all you have to do is let other owners get some enjoyment from your programming ability.

If you have any queries, please phone. Remember all entries must be received by 24th September.

Oh, those sleepless nights!

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Special Interest

ADVENTURE

3. ZORK 1

Background: Just two years ago, the American magazine "Computer Gaming World" published a chart of top-selling software compiled from manufacturers' figures. Top of the list was *K-Razy Shootout* with 35,000 in sales. Second on the list was *Zork I* with 32,000 in sales. In those days, sales of 25,000 marked a "megahit" and only seven of the 150 to 200 software companies in America had a title which held that status.

Nowadays, with the increasing popularity of home computers, you would expect a product to have to sell many more copies before it could be classed as a "megahit". Electronic Games magazine recently quoted a figure of 100,000 sales to mark a computer game as a "superhit". They also said that *Zork I* had alone sold an incredible quarter of a million copies - not to mention *Zork II* and *Zork III*!

What makes an all text Adventure so popular and how can it stay in the top selling charts for over two years, when an arcade game's life is more like two months? I'm afraid I don't know. Maybe *Zork* is just more fun than any arcade game...

Zork was written by Timothy A. Anderson, Marc S. Blank, Bruce K. Daniels and P. David Labling while they were associated with the famous MIT Laboratory for Computer Science way back in 1977. The laboratory had acquired a copy of Willie Crowther and Don Woods' *Original Adventure* (see Issue 8) and they used to spend all their spare time playing the game. In doing so, some of the game's deficiencies became apparent and the competitive spirit that often animates computer researchers inspired them to write a successor. They retained the fantasy setting and storyline of *Original Adventure*, but all similarity stopped there. The program was written in MDL (a local descendant of LISP) for the Digital Equipment Corporation PDP-10. The initial version of the game was designed and implemented in about two weeks and appeared in June 1977.

The original version had 10 or 12 problems to solve and the traditional two word verb-noun input. Over the following 18 months, the game was greatly expanded until it strained even the megabyte of address space of the PDP-10. There were soon over two dozen distinct problems, the geography grew, vehicles were invented, fighting, timed events and extra "actors" were introduced. And of course, the parser was overhauled until it



by Garry Francis,

Sydney, Australia

reached the point where it was considered state-of-the-art. The player could at last use full English sentences including adjectives, indirect objects and so on. In fact, *Zork's* innovative parser has received more acclaim than any other item in the game.

Zork was later translated into FORTRAN and made available through the Digital Equipment Computer Users' Society (DECUS) program library under the name of "Dungemon". *Dungemon* probably didn't catch on quite as well as *Original Adventure*, but when it did, it cost firms more time than *Original Adventure* ever did because it was harder and far more interesting.

Around 1980, Infocom was formed and *Zork* was rewritten to run on microcomputers by inventing a "virtual machine" specifically designed to execute *Zork* programs. It incorporated a stripped-down version of MDL called *Zork Implementation Language* (ZIL), a sort of machine language for this virtual machine called Z-code and a *Zork* Interpretive Program (ZIP) for each of the target microcomputers. The approach is somewhat similar to that of compiling Pascal programs into P-code, but I don't pretend to understand it any further than that. (Interested readers are referred to "How to Fit a Large Program into a Small Machine" by Marc Blank and Stu Galley in *Creative Computing* July 1980 for a full explanation.)

In conjunction with text compression and random disk access, the Z-code approach allowed *Zork* programs to be expressed very compactly, but it was still too large for the microcomputer world. As a result, it was split into two smaller, independent games. These were *"Zork I: The Great Underground Empire"* (which included about 60% of the original and was released in 1980) and *"Zork II: The Wizard of Frobozz"* (which was released the

following year and included most of the remaining 40% of the original plus some new features). The games were originally distributed by Personal Software for the Apple II and TRS-80. Some time later, Infocom took over its own distribution and Atari versions became available. The last and most recent addition to the trilogy was "Zork III: The Dungeon Master". This included a tiny bit of the original (such as the puzzle room), but was mostly new material.

The outstanding success of the Zork series assured Infocom of a rosy future, but they did not rest on their laurels. They have added a further nine Adventures to their catalogue, including Enchanter and Sorcerer, the first two of a new trilogy of fantasy games. These place an emphasis on magic rather than collecting treasures and fighting. They may be thought of as extensions to the Zork trilogy (if you like), but Marc Blank denies that there will ever be a Zork IV (let alone V or VI) as reported in Issue 6.

In closing, have you ever wondered what Zork actually means? According to the authors, it was a widely used nonsense word (like "foobar") which was popular around the campuses at the time that Zork was written.

HINTS: I won't bother with a review of Zork I, as it has been covered in just about every computer magazine ever published. Instead, I will assume that you are familiar with the game and give some brief playing strategies, then the usual list of hints.

Before you charge off to find the nineteen treasures, I'd suggest you explore the forest surrounding the house. This will give you a feel for how to map the vast domains of Zork. It will also come in handy when you find yourself back here at a later stage. Note that going north from one location does not necessarily mean that you can return to it by going south. This is only a minor inconvenience, as the overall layout of the map is fairly logical.

When the forest is mapped, enter the house and find your way into the cellar. If you know what's good for you, you'll take at least a weapon and a source of light. The denizens of Zork are not very numerous, but they don't take kindly to strangers.

Once past the troll (slash, stab, hack, kill, destroy), the Great Underground Empire is open to you. Map as much of the terrain as you can before trying to

solve any of the puzzles, but leave the maze until later. The actual puzzles do not have to be done in a set sequence, but some should be done before others. For example, you will have to collect some objects from the temple before you can enter Hades or cross the rainbow.

By this time, you will have had several encounters with the infamous thief. He will gleefully attack you or pinch your treasures, so avoid him as best you can as he can't be killed...yet!

Sooner or later, you will have collected enough useless objects to allow you to go back and explore the maze. Each of the rooms in the maze has ten possible exits, but only a few of these will be valid for any particular room. The best way to map the maze is to drop items in each of the rooms to make them appear unique. Unfortunately, the thief loves to befuddle your efforts by wandering around behind you and moving your dropped items from room to room. If you weren't cursing the thief before, then you certainly will be by now! But don't panic. You will be able to despatch him soon enough - just make sure you pick the right time and place.

Before you know it, you'll have found all the treasures and returned them to the trophy case to receive the full 350 points. Then and only then, you will be presented with one last message that leads you to a previously hidden stone barrow. This is the gateway to Zork III!

Now wasn't that easy?

ZORK HINTS on page 16

CORRECTIONS

The listings in the last issue were generally well received but the listing program threw up a few peculiarities. Line 965 in **DIAMONDS** should be just seven spaces between the quotation marks and line 435 in **HOUSE OF SECRETS** should read **NOUNS(200,200)** and **NOT NOUNS(200,2,200)**.

Many readers had problems with **HOUSE OF SECRETS** which is not surprising considering the length of the listing but several readers advised that they had it running successfully. It will run but if you are still stuck why not send to David Blesse for a copy? It is well worth it.

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HINTS - ZORK 1

Missing a jewelled
scarab?

42 42 42 42

Missing a bag of coins?

28 15 59

Missing a shallow?

28 15 57

Can't get past the
Cyclops?

19 15 20 8 55 64 53 55
15 60

Missing a golden clock-
work canopy?

38 15 67

Missing a beautiful brass
bauble?

28 11 15 61

| | | | | | |
|----|---------|----|-----------|----|-------------|
| 1 | THING | 14 | EXORDISM | 27 | MORE |
| 2 | BIGHT | 15 | THE | 28 | TRY |
| 3 | PRAY | 16 | YOUR | 29 | WITH |
| 4 | PLACE | 17 | SOMEONE | 30 | FIRST |
| 5 | USE | 18 | KILL | 31 | BUTTONS |
| 6 | RIND | 19 | READ | 32 | APPROPRIATE |
| 7 | WILL | 20 | OVER | 33 | SKILL |
| 8 | LETTER | 21 | AT | 34 | ECHO |
| 9 | T | 22 | SACK | 35 | LOOK |
| 10 | HM | 23 | SOMEWHERE | 36 | WRINCH |
| 11 | WINDING | 24 | MIRROR | 37 | EXAMINE |
| 12 | BE | 25 | THINGS | 38 | STRONGER |
| 13 | AND | 26 | ANSWERED | 39 | PLUR |

Can't open the grate?

6 15 71

Can't open the jewel-
encrusted egg?

47 15 67 46 17 29 27
33

Can't enter the house?

38 15 58

Haven't found the cellar
yet?

35 68 25

Can't get past the troll?

16 10 66

Can't empty the dam?

62 29 15 31

Being downed by a leak in
the maintenance room?

5 15 54

Still can't empty the
dam?

5 15 36

Can't fill the thief?

74 40 65 38

Can't can't get get the
platinum platinum bar
bar?

78 34

Can't get the coffin out of
the temple?

28 15 2 1 13 16 60 7 13
26

Are you dead, but haven't
been reincarnated?

3 21 15 32 4

Can't pass the ghosts at
the entrance to Hades?

15 14 49 69 41 43

Can't see the relevance of
the mirror rooms?

38 24

Missing a sceptre?

15 45 75 51 66

Missing a pot of gold?

23 20 15 77 77 77

Can't cross the window?

50 45

Problems with a depraved
bat?

35 70 15 44

Missing a diamond?

72 75 52 73 55 9

Can't find a loaf?

37 15 56 55 48

Missing a large emerald?

63 76 63

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| 40 | UNWIL | 53 | LINE | 66 | I |
| 41 | PELIGROUS | 54 | BLINK | 67 | EGG |
| 42 | DIC | 55 | OF | 68 | UNDER |
| 43 | ITEMS | 56 | PLE | 69 | THREE |
| 44 | BROWN | 57 | THEP | 70 | IN |
| 45 | SCPTRE | 58 | WINDOW | 71 | KEY |
| 46 | TD | 59 | MAZE | 72 | WHAT |
| 47 | GRV | 60 | PRAYER | 73 | MADE |
| 48 | PLASTIC | 61 | CANARY | 74 | WANT |
| 49 | REQUIRES | 62 | PLAY | 75 | IS |
| 50 | WAIVES | 63 | BUOY | 76 | OH |
| 51 | EGYPTIAN | 64 | SACH | 77 | |
| 52 | DIAMONDS | 65 | YOU'RE | 78 | SAY |

Programming

PLAYER MISSILE GRAPHICS...

manipulating strings

In issue 9 David Eaton showed how to use Player Missile Graphics with strings in a rather elegant way by making the computer do all the work. The method worked by dumping the Player Missile area into a string but in this article we will explore the alternative method of dumping the strings into the Player Missile area. This method saves memory as you need only one dimension one string for each Player used. For a two-line resolution Player therefore only 128 bytes are used in the string.

In order to move strings we must look around with the Variable Value Table (VVT) and the string/array area (STAR). The accompanying program demonstrates how to do this but we will also have a look at what else you can do with VVT and STAR. First though to the program.

The program is called Turtle and once running, there will be a little joystick controlled animated turtle on the screen. It draws a line behind it which can have any of three colours chosen by the Option, Select or Start buttons. Pressing the fire button stops the line being drawn while the turtle moves and Shift-Clear will clear the screen.

```

1 DIM *****
2 DIM * MISSILE by John S.T. Incester *
3 DIM * *
4 DIM * * PML (256) (256) *
5 DIM *****
10 DIM A$(128),B$(128),C$(128),D$(128)
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```

The animation is done entirely by string manipulation, A\$ is the turtle shell string, superimposed over the Player Missile Graphics area. B\$ is the head and legs P/M string. C\$ contains eight turtle shells, one for each direction, and two blanks. It is analogous to the character set in the computer except each "character" is ten lines high (like Artic mode S). D\$ and E\$ contain eight head and legs shapes, one for each direction, and are mirror images of each other.

The joystick direction, minus 4, is put into variable S1. This variable, via S2 and S3, selects the correct turtle shell and head and legs shapes to be transferred from the character strings into A\$ and B\$. With each step, the loop gets the head and legs shape from C\$ and E\$ alternately which gives a stepping motion. This occurs in lines 100-150 but otherwise all movement is as in David Eaton's article.

To get A\$ and B\$ up into the Player Missile area we have to look at STAR. This has a pointer telling you where it starts which is called STARP and is at decimal locations 140 (low) and 141 (high). It is important to get the variables into the table in the right order and therefore A\$ and B\$ must be the first variables typed. If not the method simply will

by John R.T. Brazier

not work. **AS** is Dimensioned to 128 and therefore takes up the first 128 bytes of STAR. The first byte is where STARP points. **BS** takes up the next 128 bytes and **CS** follows with 100 bytes and so forth. Whilst strings take one byte for each character, arrays use six bytes for each number so DIM X(100) would use 600 bytes.

STAR is a passive area allocated by BASIC for the data in strings and arrays and so is controlled by a set of pointers and length definers which reside in the Variable Value Table. There is a pointer telling you where the VVT starts at decimal locations 134 and 135 (VVT#). The Variable Value Table contains three types of information:

- it holds all simple variables directly.
- it holds the pointer and lengths of arrays.
- it holds the pointer and lengths of strings.

Table 1 shows the VVT for a program that first Dimensioned a string, then an array and then had a normal variable. Each entry takes 8 bytes. Note that, once in, a variable is never deleted except by LISTing to storage and ENTERing, SAVing or CSAving saves the VVT first and therefore it will remain the same even if you have unused and uncreated variables.

After this digression let's get back to the program. We need to manipulate the offsets as shown in Table 1. In Turtle, the first string - **AS** - will have an offset from STARP of 0. Look at line 2000. ATAB

gets the value of STARP, where STAR begins and also where **AS** begins. In line 2000 we set **L** as the Player Missile base, in pages. In 2040 we find OFFS1, the difference between where the first Player should be (512 from PMBASE) and the start of STAR. This is calculated in bytes. Lines 2050 and 2060 break OFFS1 into low and high values and POKE these values into the offset pointer for **AS** at VVT#+2 and VVT#+3. The process is exactly the same for **BS** which via OFFS2 is 128 bytes higher up than **AS**. That's all there is to it! BASIC now thinks that the STAR for these two variables is in the P/M Graphics area.

Before we leave, let's take a look at what else you can do with the Variable Value Table. If you type in Program 2 you can see a demonstration of changing the Dimension of strings, **AS** and **BS** both grow from a length of 3 to 10. Here both the offset bytes and the Dimension bytes of VVT are being altered. As we are not moving the string contents around in STAR, however, this is a 'destructive' re-dimensioning and the strings will be full of garbage which needs to be cleared. If you wanted to keep the contents of the strings while making them larger you would need to move the string contents in STAR to the right places. I won't go through this program but I hope that I have given you enough information for you to work out what is going on.

```

10 M=1:Z=0:REM BS(3),BS(3)
20 SUPER(104)+PEEK(127)M256
30 POKE M*2,10:POKE M*3,0:POKE M*4,
  10:POKE M*5,0
40 Z=PEEK(66)+PEEK(67)M256:Z=Z*7:P
500 M*25, 12/256-INT 12/256:M256:POKE M
  +17,INT 12/256
500 M*256+M256*2:10:BS(10)M256
60 T:GOTO 60

```

Table 1. Organisation of an example VVT

| Bytes of Table | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----------------|-----|--------|--|---|----------------|--------------|-----|---|
| String | 128 | ID No. | Offset from STARP | | Present length | | DIM | |
| ARRAY | 65 | ID No. | Offset from STARP | | First DIM+1 | Second DIM+1 | | |
| Simple Variable | 0 | ID No. | ---- Six byte binary-coded decimal number ---- | | | | | |

First byte gives type of variable (for a string or array this will be one less if unidimensional). Zero means a simple variable. All numbers are in decimal.

Second byte gives the number of the variable. The first entry is 0, the second 1 and so on.

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SCREENDUMP

Computer Art comes to PAGE 6! The following screens were done by Harvey Kong Tin of New Zealand using MicroPainter. The screens were dumped on an NEC 8023 printer using Megafont.



If you have any pictures suitable for SCREENDUMP please send them in. The screens can be drawn with any utility but must be saved in MicroPainter compatible format. Please send files on disk with a brief note of how they were drawn and some details of yourself to the editorial address on page 3. All disks will be returned.



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Programming

What is USR?

USR is probably the least well-documented function in ATARI BASIC, yet it is potentially one of the most powerful. This introduction is in three parts. First we look at what USR is and the syntax it uses. This is for BASIC programmers who have come across it in program listings and just want a feel for what it does. The second part looks at the way USR works and outlines the general principles of inserting machine-code subroutines into BASIC. If you are not into machine-code and don't intend to start writing your own routines, you can comfortably skip this bit. Finally, we look at some examples you can experiment with, including a routine for copying the ROM character set into RAM at lightning speed.

Let's start with the simplest form a USR statement can take. This looks something like `X=USR(1536)`. In English, this means 'Stop executing BASIC for a moment, go execute the machine-code routines which start at address 1536 and put the resulting number into variable X'. In the majority of cases you won't give two hoots what the value of X turns out to be, what is important is the execution of the subroutine along the way. If it is designed to move a player about on the screen, your only concern is whether the movement works. If it is a scrolling routine, then it is the actual scrolling that counts. Any hypothetical number generated at the end of the routine would probably have little relevance to the real world anyway and you would hardly ever use it for anything. So why bother assigning a variable to it?

The answer is that USR is not a command like `GOSUB` or `POKE`. It is a function, like `PEEK` or `INT`, so we can't simply type `USR(1536)`, we have to give it a command to work with. Theoretically, we could use any command that works with a number. `TRAP` or `RESTORE` would do, provided we knew that the number would never exceed 32767 (the maximum allowed with these commands). `PRINT` would also work but would mess up your screen display. The most convenient command is `LET` using the format '`LET X=`' or, more simply '`X=`', since this does not place restrictions on the number following it and has no discernable effect on program execution.

You are not stuck with X as a variable name of course. Some programmers prefer statements like `MOVE=USR(1536)` or `SCROLL=USR(1536)` to give a clue about the subroutine's purpose. Similarly, the number in

brackets need not be 1536 although that is a common one since it is the first location of an area (page 6) specially reserved for things like machine-code subroutines. It need not even be a 'raw' number. Variable names or expressions (like `2*3+5`) are equally acceptable, provided they evaluate to the correct starting address. The thing to remember is that, however many numbers appear in the brackets, the first one is always the place where the machine-code routine starts.

Now a machine-code program is simply a long list of numbers, each representing either a command or an item of data, depending on its position. You can, if you like, see what the routine looks like by finding the place in your BASIC listing where the numbers are put into memory, starting at the address given in the USR statement. There are numerous ways of getting a list of numbers into RAM. Very large routines might be loaded from cassette or disk directly into the chosen memory area, using something known as a 'direct I/O call', but it is unlikely you will encounter this method in public domain BASIC programs. A very common technique is to `POKE` the numbers one at a time into RAM, using `READ` and `DATA` statements. A third approach is to `DIM`ension a string to the length of the machine code routine, then store the list of numbers in that string as ATASCII symbols. In such cases, the USR statement will take the form of `X=USR(ADR(A$))` and you will find `A$` written out somewhere in the listing, looking like a meaningless jumble of characters and symbols. This method saves both space and time, since it eliminates the need for a machine-code loading program, but it is extremely vulnerable to typing errors and a single mistake can crash the system. One final, and little used, approach is to put very short machine code routines into the USR statement itself, either as extra numbers or ATASCII symbols. De Re Atari gives the example `X=USR(ADR("hilly"/LW/d"/d"/16))` but I have never seen it used anywhere else and most subroutines will be too long to encode in this fashion. My personal preference is for the `POKE`, `READ` and `DATA` technique. This is much kinder for anyone who has to copy the program from a listing and makes debugging a lot easier.

Let's now look at the other numbers you might find in a USR statement's brackets. How about `X=USR(1536, 100, 20, 3000, PLR1, MEMTOP-10)`? These extra numbers are known as 'parameters' to make the point that they are not

Len Golding explains....

addresses. They are just ordinary numbers which will be used somewhere in the machine-code routine called by that USR statement. A parameter can be a real number, a variable name or an expression, the only restriction is that it must evaluate to a number between 0 and 65536. It might indicate which joystick the routine should read, or which player to move, or which colour register to use, or where in memory to find some data, or where to store a result - almost anything in fact. It is even possible, by using variable names, to pass the result of an earlier calculation carried out in BASIC, like how much memory there is left at any given time, or where to put an explosion on the screen. A USR statement can contain up to 255 parameters, but you are not likely to encounter more than half a dozen or so.

Discovering what the parameters mean in any given instance is a thankless task unless the programmer has deliberately made it easy for you. Sometimes he or she will have used variable names whose function can be identified from a close inspection of the BASIC listing. Alternatively, there may be a REM statement close by explaining all. If neither of these applies, there is normally no easy way of discovering what the parameters mean, or how the machine code routine uses them. Just type them in and trust the programmer!

Now on to the second part, how USR works. I'll assume that if you are reading this section you know about converting decimal numbers to 2-byte integers and how a LIFO stack operates. If not, skip the next couple of paragraphs. Better still, get hold of a decent book on machine code and find out!

When a USR call is made, the following things happen:

- The processor notes where it is in the BASIC program, and pushes this location onto the stack for later use as a return address.
- Any parameters passed are converted into 2-byte integers and pushed onto the stack, low byte first.
- A one-byte value containing the number of parameters passed (even if it is 0) is pushed onto the stack.
- The machine code routine is executed.
- On encountering the final RTS instruction, the top two bytes are pulled off the stack and used as

the return address. All being well, this transfers control back to BASIC, at the next statement after the USR call.

Note that I say 'all being well'. A number of things can go wrong if we're not careful. First of all, there is that byte mentioned at c), sitting on top of the stack ready to foul things up. Unless we get rid of it, the processor will think it is part of the return address and, when the final RTS is encountered, will bounce off into the lower reaches of operating system RAM instead of returning to BASIC. Consequently it is a good idea to do a PLA right at the start of your routine to be sure you don't forget it. For exactly the same reason, all parameters have to be pulled off the stack before the final RTS. They can be left there until you need them in your routine of course, but newcomers to machine-code programming may find it safer to retrieve them at the start of the routine. They can always be stored in a less critical location until you need them.

Remember that all parameters are converted into 2-byte integers, even if their value could be contained in a single byte, so to retrieve a one-byte parameter, you have to do two PLAs and discard the high byte. Also, don't forget that parameters come back off the stack with their high byte first. This can be a bit confusing if you are used to the conventional 'low/high' order of storing 2-byte numbers. Lastly, do make sure that your routine ends with an RTS. I know this sounds obvious, but it is easy to forget, especially if the routine uses a lot of JSRs (e.g. accessing ROM routines).

On now to the third section, where we get down to some practical examples. Here is the simplest machine code routine I can think of

```

PLA          ;Get rid of the number of
             ;parameters byte
LDA 20
STA 710      ;Store 20 in the address
             ;controlling  screen
             ;colour
RTS         ;Return to BASIC

```

In decimal form, this routine translates to : 104,168,20,141,198,2,96. Before we can do a USR call though, these numbers have to be put into some safe area of memory. Let's use address

continued overleaf

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CORBLY USERS GROUP: I am thinking of setting up a User Group in the Corby area. Anyone interested? Marco Dawson, 15, Tyne Road, Corby, Northants, NN17 2HU

ASSEMBLER PROGRAMMING: Anyone in my area interested in swapping ideas etc? Meet or write. Steve Hill, 5 Broadstones, Durkar, Wakefield, W.Yorks, WF4 3BE

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OXFORD USERS GROUP: Any support for a User Group in Oxford? Please contact Matthew Spencer with any ideas etc. Tel. Stonefield 757 or write 10, Pumber, Stonefield, Oxford, OX7 2GF

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LIGHTPEN: Do you have a light pen program in Basic that will draw in Graphics 8? Please contact Jonathan Russell, 289 Camplin Road, Cambridge, CB4 2LE. Tel. 0223 62006

NORTHERN IRELAND GROUP: Feeling left out? Anyone interested in a User Group in the Belfast area with the possibility of publishing a book and a software library? Please write with s.a.s. to Frankie Smyth, 62, Orchardville Ave., Belfast, BT10 0JH

GHOST TOWN/THE COUNT: I am completely baffled about how to show the horse in Ghost Town or get past the coffin in The Count. Can you help? Anthony Postle, 22, Greenscapes Drive, Lutterworth, Leics, LE17 4TG

PAGE 6 BACK ISSUES: The following readers require copies of issues 1 & 2

Derek Ross, 117 Moss-side Road, Silverdale, Glasgow G41. Tel. 041 632 5737

Martin Gibson, 45, Westerdale Way, Silverdale, Nottingham, NG11 7ET

ZORK 1: I am just starting the perilous journey and would welcome exchanging ideas or information in writing with another on the same journey. John Dimer, 71 Duncan Drive, Elgin, Moray. Tel. 0343 44695

850 INTERFACE: Anyone got one to sell? John Dimer (address as above).

THE SOFTWARE REVIEWS

*** STAR GAME ***

ATTACK OF THE MUTANT CAMELS

LLAMASOFT 16K 1/2 PLAYERS

In the words of the feisty Llama man himself, *Like, WOW, man...this is a real blast!* Mutant Camels comes to the Atari with a vengeance. Not just a translation but a full blown adaptation using all of the Atari's powerful features including display list interrupts, scrolling, player missile graphics, animation and **AWESOME** sound. Llamasoft have been bandying the word **AWESOME** about for some time but now that he has had the chance to pull the stops out of an Atari, I am sure that Jeff Minter now knows what **AWESOME** really means. You don't really need to read any further, just get your £7.50 (yes, that's all off to Llamasoft and wait for a superbly packaged, excellently programmed, top quality cassette to drop through your door. You won't regret it.

For those of you who don't know anything of the Llama man's games, let me give you some details of this one. It helps to know a little about the game's designer, Jeff Minter, a kind of young eccentric in the grand English tradition who lives in a sixties time-warp, is in love with Llamas and writes weird games about Mutant Camels and Sheep in Space. Don't let the eccentricity fool you, the man is a brilliant programmer and has his finger right on the pulse of the eighties micro/arcade scene. The game features an attempt by the race of Zyxos to stop mankind from leaving Earth and exploring the galaxy by using genetic engineering on camels to create 90 foot high, neutronium-shielded, laser spitting beasts designed to bring death and destruction to Earth. The beasts can be destroyed by neutron-canon bolts from a highly manoeuvrable fighter ship and that is your task. The Camels march relentlessly across the screen and you must destroy them one by one by pumping them full of neutron bolts. Your ship is shielded but loses shield power each time you collide with a Camel or are hit by a laser bolt until nine hits destroy the ship. The colours are brilliant with display list interrupts or GTIA forming the sky, pyramids on the horizon and a forward scrolling foreground. If you destroy all Camels on a level you go into hyperswap phase and must avoid missiles as the terrain scrolls by at incredible speed. Colours on the hyperswap are even better.

The only game to have been reviewed in **PAGE 6** which has been given the title **STAR GAME!** Partly because there has not been a better Atari game at this price, partly because it proves to the world that Atari is the best home-computer around and last but not least because any man that is mad enough to admit publicly that he loves llamas must be alright. The fact that he can write brilliant programs helps too.

Atari software generally sells in quite small quantities compared with other micros and if Jeff Minter is to adapt his other games it will require you to show your dedication and support by buying this in your thousands. If you love arcade games, you could not spend £7.50 more effectively. Buy it, get all your friends round and show them what a great game on the best micro looks like and get them to buy both an Atari and Attack of the Mutant Camels.

Les Elingham

GWENDOLYN 40K DISK

ARTWORX 1 PLAYER

Gwendolyn is an 'arcade-adventure' of the type which is fully joystick controlled and comes on two disks. The arcade adventure is much more graphically oriented than the text based adventures and Gwendolyn includes a certain amount of animation and sound. Whilst there are puzzles to solve the choices are limited and the plot is therefore not as complex as most text based adventures. The graphics are reasonably good but use artefacting which does not lend itself well to the PAL system and the images are therefore lacking in colour. At first I was quite disappointed with the game mainly because of the limitations of joystick control and I wandered around for a long time doing absolutely nothing, but once I was underground it became more interesting. Eventually I became hooked as more progress was made. One of the attractions of a two-disk adventure is to get onto the second disk! Gwendolyn is much more suited to novice or intermediate Adventurers or those who like some graphics and action. Experienced text Adventurers would probably find the joystick control too limiting and are likely to solve the adventure in a short time.

Les Elingham

BLUE THUNDER 16/48K CASS.**RICHARD WILCOX** 1 PLAYER

Blue Thunder is a helicopter rescue mission similar to Chopper but if you have not seen that game or could not afford it, you can get similar enjoyment from Blue Thunder for just £9.95. Your mission is to rescue your comrades from a remote island whilst avoiding hazards such as ground and sea based missiles, armoured barrage balloons and electric storms. Your jetcopter is armed and can destroy the nuclear reactor besides which your comrades are held captive but not the gun emplacements which you must pass. The best feature of the game is the control of the helicopter which is quite realistic (a fact confirmed by a reader in the RAF) and is fairly complex to master. The joystick controls the direction of the helicopter in the normal left, right, up and down motion but with the trigger pressed, the helicopter can be turned. A medium press will turn through 90° and a long press through 180°. As the trigger is also used to fire missiles (via a short press) it can take some time to master the controls. The helicopter banks as it turns and heads away and looks very good. The background graphics are of reasonable standard and the game scrolls over six screens. In the short time available for review I was not able to rescue anybody so there would appear to be some challenge to the game which should keep you occupied for many hours. Blue Thunder is not a fast paced game but requires plenty of control and is a worthy addition to your collection.

Les Ellingham

DAN STRIKES BACK 16K**ENGLISH SOFTWARE** 1 PLAYER

So you weren't lucky enough to win the real diamond in Diamonds? Never mind you can at least now carry on with the adventures of Dan but this time purely for pleasure. Many of the characters from Diamonds are here including the infamous Brian the Blob and the idea is similar in that you need to descend various levels to reach the Great Diamond which Brian has now stolen from Dan and stored in an underground vault. Dan does not dig in this game but rather drops and climbs various fixed platforms clearing mushrooms as he goes. I found

Dan Strikes Back to be much more interesting than Diamonds as there is more thought required to work out the correct directions to clear each level. Various sections have gates which open and close making it necessary to work out moves in advance to ensure that you do not get trapped. One of the problems is that Brian is also in the vault and follows you everywhere.

Before you can gain the next level you must cover and clear each part of the current level and you have the chance to score bonus points by collecting magic toadstools which occasionally spring up. On level 3 a giant spider prowls the vault leaving webs which you must break through and which delay your progress. The puzzles of how to reach each part of the vault get more complex at each of the six levels until finally you can see the Great Diamond. All you have to do then is get back out again with Brian and all his nasty friends in hot pursuit. If you enjoyed Diamonds you should also enjoy Dan Strikes Back. I certainly found it more satisfying.

Les Ellingham

GEOMETRY 16K CASS.**SOFLOW SOFTWARE**

Geometry is the first in a series of educational software from Soflow Software designed as a revision aid for the 'O' level syllabus. The program comes in several sections and uses not only diagrams and text on screen but also that unique, but much underused, Atari feature, the audio-sound track. Each section of the program is introduced and commented on by a clear female voice on the soundtrack and care has been taken to ensure that the soundtrack supplements the program and does not merely repeat what is on screen. The program itself requires interaction from the user in answering questions at various stages. Unfortunately the subject itself was too complex for me! but I have been assured that the content has been checked for accuracy by a qualified teacher so there should be no complaint in this area.

Many parents have bemoaned the lack of educational software for the Atari and the little that has been published is mainly for pre-school children. Writing software for children of secondary education age is not easy but the Soflow series provides a good start in this neglected area.

Les Ellingham

MUSIC CONSTRUCTION SET

ELECTRONIC ARTS 48K DISK

In the wake of so many graphics programs and utilities, the sound and music capabilities of Atari computers seems to have been ignored, but now Music Construction Set from Electronic Arts has put that to rights.

The screen consists of two staves (the Bass and Treble clefs) and a graphic menu. The menu contains a complete set of notes and rests, a time signature indicator, a time counter and nine symbolic pictures, or icons, representative of a certain command, e.g. a disk for disk commands. The approach is very similar to Petalab Construction Kit. The Hand icon is the most important as this controls the entire workings of the MCS. The Hand can be controlled from a choice of controllers such as joystick and keyboard or the Atari Touch Tablet or Koala Pad.

The hand is used to control the speed, sound and volume, time signature and for manipulation of the icons and even to change the key in which the music is played. Most importantly, however, it is used to write music. By placing the hand on a note, rest or other musical notation such as tes, octave raisers etc., and pressing the trigger, the item can be picked up and placed anywhere on the staves. The facility is ideal for music development or copying from manuscripts.

In the middle of the screen are five gauges which give complete control over speed, volume and various instrument effects such as piano, drum, accordion and vibrato. The editing facilities are also extremely efficient using the 'cut and paste' technique. Bars can be cut out and replaced anywhere in the same piece of music or even another piece loaded from disk. It is also possible to print the music on a dot-matrix printer giving a full printout of the score.

There are drawbacks, however, to what is otherwise an excellent program. In the disk command mode, if load or save are not specified and the filename begins with F, the program will format any disk in drive 1 without chance of verification. Secondly, it can only take 70 bars of music from either staves in memory at once which is a little short and might not allow a full piece of music to be worked on at any one time. Thirdly the controls are a

little coarse and take practice to operate correctly.

The MCS is set up to use only three of the Atari's four voices in order to give better bass notes but you can select four voices if required. It is not only the bass notes that sound good however, the whole musical quality must be heard to be believed.

Gary Sabin and Julian Bailey

DUELLIN DROID 16K

ENGLISH SOFTWARE 1 PLAYER

If you are looking for a fast action robot-shooting game, give Duellin' Droids a look for it certainly packs some fast action. The game itself is very simple, all you need to do is shoot all of the creatures in the arena and score bonus points by rescuing the "Little Pink People" who wander about. The main appeal is the speed and there are 99 levels to survive. Graphically it is very strange, written possibly in Artio mode 5(2), and it looks a little disappointing at first. Once into the game however this is not so important, it is just a question of surviving those 99 levels.

Les Ellingham

TOP TEN

| | | | |
|----|--------------------|-------------------------|---------|
| 1 | ENCOUNTER | Novagen | 16K C |
| 2 | SNOWBALL | Level 9 | 32K C |
| 3 | BASIC XL | O.S.S. | 16K ROM |
| 4 | ACTION! | O.S.S. | 16K ROM |
| 5 | BRUCE LEE | Dassoft | 32K C/D |
| 6 | THE HULK | Adventure International | 24K C |
| 7 | DANGER RANGER | Microdeal | 16K C |
| 8 | A.C.E. | English Software | 16K C |
| 9 | COLOSSAL ADVENTURE | Level 9 | 32K C |
| 10 | MAC 65 | O.S.S. | 16K ROM |

Chart compiled 20/7/84
by The Atari Center
021 643 9100

VARSORT 1

This is the first of two Variable utility programs. The second VARSORT2 which allows you to add descriptions to the variables and which can be accessed from this program will be published next issue. Whilst written for disk users, the program can be easily converted for cassette.

When writing a program which uses quite a lot of variables, it is very easy to forget which variables you have already used. It is possible to obtain a list of these from the computer itself but they will be in the order of entering. This program is 'ENTERed' from disc and tacks itself on to the end of your program (its line numbers run from 32000 upwards). When 'ENTERed' type 'GOTO 32000' and the program will clear the screen and print, in three columns, all the variables you have used so far. You will then be asked to press any key for a 'sort'. The sort section is the one used in a program published in Page 6 some time ago although in this version you can watch its progress on the screen. When completed, the sorted list of variables is displayed on screen, again in three columns. You are then asked if you want to print them or put them to disk - the filename is fixed. Finally you have the option to call 'VARSORT2' or finish. A word of warning - whichever option you choose will erase your original program from memory - so SAVE IT FIRST !!!

The program runs as follows:-

FETCHING THE VARIABLES

Line 32000 dimensions the strings and array used. The array is cleared.

Line 32010 sets the mode to zero; sets the colour; clears the cursor.

Line 32020 prints the heading asking you to wait for the variables to be fetched.

Line 32030 sets a TRAP; OPENS a channel for input from keyboard.

Line 32040 sets a loop 'XX' which will run from the address contained within memory locations 130 and 131 to that in 132 and 133 LFSS47. The first is the beginning of the variable list - the last is the end minus 1. Why 47 then? The variables used in this program occupy 46 bytes and, as we don't want them listed we stop the list just before they are reached.

(A word of explanation - the variables are listed none to tail with no gaps in between. What makes it easy to pick out each separate variable is the way in which the last character is stored - as an INVERSE character. The ASCII number for an

inverse character is 128 greater than that for a normal one).

Line 32050 looks at the value contained in 'XX', if less than 128 then its value is passed on to 'XXX'; GOSUB's line 32100 and on returning GOTO's 32070.

Line 32060 is only reached when a PEEK at 'XX' is greater than 128 and when this is so then 'XXX' is made equal to 'XX' but less 128; GOSUB's 32100 and, on return, is immediately GOSUBbed again to line 32110, for it obvious that a complete variable name has been obtained.

Line 32070 sends you back for another pass through the loop until finally the list is exhausted whereupon the program GOSUB's to line 32440 (the screen print-out).

Line 32080 prints the request to press any key for the sort to begin and then waits for your input.

Line 32090 clears the screen and GOTO's line 32150.

Line 32100 adds the individual characters of the variable (in 'XXX') to a string 'XXS'.

Line 32110 is brought into use when the complete variable is contained in 'XXX', the string is then checked for length, (not 10 characters then it has a dot added until it is. As the final string will contain all the variables, each sub-string must be of a fixed length so that we can extract it).

Line 32120 adds 'XXS' to that final 'long' string. 'XARS' and 'XXS' are then cleared ready for the next variable.

Line 32130 is the error line which the TRAP, when sprung, sends the program to.

Line 32140 sends you back to line 32010 to have another try.

THE SORT

Line 32150 is the first line of the sort section. The bell is rung, warning you of the start; 'XX' is used again, this time to represent the length of each variable sub-string. A loop is started - 'XX1' - running from 1 to the length of 'XARS' divided by 'XX', this of course gives you the number of variables in the string; 'XX1' is equalled to the pass through the loop 'XX1' times 'XX'; 'XROW' is equalled to the number of variables in the string. Line 32160 Another loop 'XX2' is started running from 1 to the number of variables; 'XX2' is equalled to 'XX2' times 'XX'. This second loop completes a whole cycle whilst the first loop is stationary on one item at a time. This is used by the line 32180.

Line 32170 prints the loop positions as they are executed.

continued on page 38

VARSORT continued from page 36

Line 32180 compares the variable in the first loop (using 'XX1' to split it from the long string) with the variables as they appear in the second. When the first variable is 'less' (alphabetically speaking) than that in the second loop then 'XROW' (initially representing the total number of variables) is reduced by one.

Line 32190 goes back for another pass through loop 'XZX2' until this is completed.

Line 32200 comes into effect when loop 'XZX2' has completed its cycle, checking each of its items against the single item of loop 'XZX1'. 'XROW' now holds the actual position which the loop 'XZX1' item will hold in the new string. This is now placed in the array 'XROW', the position within the array being determined by the pass through loop 'XZX1'.

Line 32210 now returns for the next pass through loop 'XZX1' (just one item before going through loop 'XZX2' again). 'XROW' is automatically re-initialised to the total number of variables before the loop 'XZX2' starts. This continues until the whole of loop 'XZX1' has been compared with the items shown by loop 'XZX2', and the 'XROW' array contains the new positions.

Line 32220 starts loop 'XZX1' running as before. 'XX1' is set as before.

Line 32230 starts loop 'XZX2' as before. 'XX2' is set as before.

Line 32240 prints the state of the loops to screen (alongside the other).

Line 32250 checks the first loop 'XZX1' and if the pass is equal to 'XROW' array as defined by the pass through the loop 'XZX2' then the new string has the variable shown in that pass through 'XZX2' transferred to the new string in the position which 'XZX1' and 'XROW' ['XZX1'] agree upon. Line 32260 goes back for another loop through 'XZX2' and line 32270 through 'XZX1'.

Line 32280 when all is finished and the new string 'XAR1\$' contains the sorted list then this line sets about restoring the original string. 'XAR\$' is first emptied, then 'XAR\$' is made equal to 'XAR1\$'. Finally 'XAR1\$' is emptied.

Line 32290 prints the fact that the sort has been completed and line 32300 pauses for a while, clears the screen and GOSUB's line 32440 for a print out.

PRINT IT!

Line 32320 asks you if you wish to print the list - waits for an answer Y or N. An 'N' would send the program to line 32380.

Line 32330 sets a TRAP in case the printer is not

switched on: does an exploratory LPRINT, which if O.K. then passes on to line 32350.

Line 32340 is the error routine which prints the message to switch the printer on. Line 32345 sends you back to line 32330 so creating a loop, this will continue (ringing the bell in the process) until the printer is switched on.

Line 32350 sets the printer to the Condensed Print and 8 lines to the inch mode. This should be changed to suit your own printer.

Line 32360 sets 'XX' to equal 10: starts a loop 'XZX1' running from 1 to the number of variables as before: sets 'XX1' as before: prints to paper the variables out of XARS as defined by 'XX': goes back for another pass: clears the printer settings.

Line 32380 asks if you wish to record to Disc. An 'N' would send you to line 32420. The variables would be filed under the name D:XXX.DAT and can be used by the program VARSORT2.

Line 32390 sets a TRAP to close the channel when finished: OPENS a channel to write data to the above file.

Line 32400 prints the data to disc.

Line 32410 closes the channel.

Line 32420 asks you if you wish to call the program VARSORT2. A 'Y' would cause VARSORT2 to be run, so saving both your own program and VARSORT1 in the process. The moral being SAVE IT!

Line 32430 An 'N' would close the keyboard input channel and issue a NEW instruction, with the same effect as above with regard to your program.

PUT IT ON SCREEN

Line 32440 sets 'XX' to equal 10: 'XXXLIN' (line counter) to 5: 'XZX1' (screen print position) to zero.

Line 32450 starts a loop 'XX2' as before: 'XX1' is set as before: at a position defined by 'XZX1' and 'XXXLIN' the variables are printed: 'XXXLIN' has 1 added to it.

Line 32460 'XXXLIN' is checked, if 19 and 'XZX2' equals 1 the 'XXXLIN' is reset to 5: 'XZX1' to 14: 'XZX2' to 2: the program then GOTO's line 32490.

Line 32470 checks 'XXXLIN', if 19 and 'XZX2' equals 2 then 'XXXLIN' is reset to 5: 'XZX1' to 28: 'XZX2' to 3: and goto's line 32490.

Line 32480 checks 'XXXLIN', if 19 and 'XZX2' equals 3 then 'XXXLIN' is reset to 5: 'XZX1' to zero: 'XZX2' to 1: and GOTO's line 32500. ■

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LANDSCAPE continued from page 22

- 1700 GATE 1, 74, 75, 77, 78, 79, 84, 128
- 1760 GATE 1, 3, 4, 8, 15, 31, 64, 128
- 1770 GATE 144, 222, 25, 16, 20, 6, 3, 1
- 1780 GATE 229, 64, 27, 16, 4, 4, 1, 1
- 1790 GATE 4, 19, 126, 225, 128, 16, 16, 8
- 1800 GATE 8, 8, 24, 24, 24, 24, 8
- 1810 GATE 8, 8, 8, 8, 204, 128, 51, 51
- 1820 GATE 42, 148, 75, 128, 72, 144, 42, 34
- 1830 GATE 28, 48, 48, 144, 48, 48, 18, 8
- 1840 GATE 8, 128, 144, 178, 124, 178, 144, 12
- 8
- 1850 GATE 16, 48, 48, 34, 64, 178, 34, 8
- 1860 GATE 225, 125, 125, 66, 28, 24, 32, 122

Line 32490 sends you back for another pass through the loop. When the loop is finished the program RETURNS to a position immediately after the original GOSUB.

Line 32500 asks you to press a key for the next page and then waits for an input.

Line 32610 uses a loop 'XXX' to print a line of blanks from lines 19 to 5: returns to line 32490.

Even if you do not type it in I hope that the line by line explanation will help you to understand the structure of the program and will help you to write your own utilities. VARSORT2 will follow in the next issue.

FLAGS continued from page 30

- 1700 PEEK 8,70:PEEK 842,20:PEEK 844,2
- 8:PEEK 842,20
- 1710 PEEK 20,121:PEEK 203,120:PEEK 20
- 2,20:PEEK 203,20:GOSUB 1040:RETURN
- 1720 GAMP005 G01
- 1730 POSITION 22,121:GOSUB:RETURN 01
- 1740 POSITION 21,717:GOSUB:RETURN 02
- 1750 POSITION 21,717:GOSUB:RETURN 03
- 1760 PEEK 7,12
- 1770 PEEK 20,120:PEEK 204,12
- 8
- 1780 PEEK 201,20:PEEK 202,12
- 8
- 1790 NEXT I:RETURN
- 1800 GAMP005 G01:PEEK 20,12:PEEK 201,2
- 8:PEEK 202,120
- 1810 I = **XXXXXXXXXXXXXXXXXXXX**
- 1820 I = **XXXXXXXXXXXXXXXXXXXX**
- 1830 I = **XXXXXXXXXXXXXXXXXXXX**
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- 2110 I = **XXXXXXXXXXXXXXXXXXXX**
- 2120 I = **XXXXXXXXXXXXXXXXXXXX**
- 2130 I = **XXXXXXXXXXXXXXXXXXXX**
- 2140 I = **XXXXXXXXXXXXXXXXXXXX**
- 2150 I = **XXXXXXXXXXXXXXXXXXXX**
- 2160 I = **XXXXXXXXXXXXXXXXXXXX**
- 2170 I = **XXXXXXXXXXXXXXXXXXXX**
- 2180 I = **XXXXXXXXXXXXXXXXXXXX**
- 2190 I = **XXXXXXXXXXXXXXXXXXXX**
- 2200 I = **XXXXXXXXXXXXXXXXXXXX**
- 2210 I = **XXXXXXXXXXXXXXXXXXXX**
- 2220 I = **XXXXXXXXXXXXXXXXXXXX**
- 2230 I = **XXXXXXXXXXXXXXXXXXXX**
- 2240 I = **XXXXXXXXXXXXXXXXXXXX**
- 2250 I = **XXXXXXXXXXXXXXXXXXXX**
- 2260 I = **XXXXXXXXXXXXXXXXXXXX**
- 2270 I = **XXXXXXXXXXXXXXXXXXXX**
- 2280 I = **XXXXXXXXXXXXXXXXXXXX**
- 2290 I = **XXXXXXXXXXXXXXXXXXXX**
- 2300 I = **XXXXXXXXXXXXXXXXXXXX**
- 2310 I = **XXXXXXXXXXXXXXXXXXXX**
- 2320 I = **XXXXXXXXXXXXXXXXXXXX**
- 2330 I = **XXXXXXXXXXXXXXXXXXXX**
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- 2370 I = **XXXXXXXXXXXXXXXXXXXX**
- 2380 I = **XXXXXXXXXXXXXXXXXXXX**
- 2390 I = **XXXXXXXXXXXXXXXXXXXX**
- 2400 I = **XXXXXXXXXXXXXXXXXXXX**
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- 2430 I = **XXXXXXXXXXXXXXXXXXXX**
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- 2460 I = **XXXXXXXXXXXXXXXXXXXX**
- 2470 I = **XXXXXXXXXXXXXXXXXXXX**
- 2480 I = **XXXXXXXXXXXXXXXXXXXX**
- 2490 I = **XXXXXXXXXXXXXXXXXXXX**
- 2500 I = **XXXXXXXXXXXXXXXXXXXX**

A ROM EXPANSION BOX

The advantage of games cartridges is that they instant load, however you still have to open the lid to change cartridges. With tape or disk it is possible to load a particular game by typing in its name and the computer will search the tape or disk for the program required. It would be nice to select cartridges in this way but of course you can only have one cartridge inserted at a time. Even on the 800 the second slot is of no use in this connection.

The solution is, I think, to have a separate box containing its own low voltage power unit and say 10 sockets wired in parallel, except for the CE pins which are individually wired. A multiway ribbon cable is then fitted with a suitable connector and plugs into the left hand ROM socket of the com-

puter. It should be possible for someone to write a short program and with the aid of an EPROM burner put it on ROM which would be put in slot 1 of the expansion box. This ROM would contain a menu. The BASIC cartridge would be put into slot 2 with various other games or languages taking up the remaining slots. The Menu program would ask which of the available cartridges you wished to load and exiting a program by using SYSTEM RESET would bring you back to the Menu for a new selection. I thought of this idea about six months ago and keep meaning to try it out but available time does not permit. On this occasion perhaps I can pass the idea over to PAGE 6 readers and maybe one of you could come up with a finished product or prototype. Figures 2 and 3 give a little more information to get you started.



Shielded ribbon cable to computer left hand cartridge slot

These sockets are 10-way double ended F.C.B. connectors part no. AMP-8906-7-52831-0. They are used in parallel with the exception of the CE which enable pin. It is suggested that standard TTL 1-0 (such as 7442) is used in driving the appropriate pin low.

If you want to install 10 sockets instead of the suggested 10 then I would suggest using 74154 TTL D.C.



Figure 2



Figure 3



Connector's side of 10 pin ribbon cable and 1 resistor



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FIRST STEPS

Mark Hutchinson

Have you ever written a program in *Graphics 1* with a text window and wished that you could have the space of *Graphics 0* but still use the window? Well, you can. Normally changing the screen means altering the display list but as the window itself is in *Graphics 0* I would consider this an impossibility. You may be able to use the vertical blank interrupt but you would need to know machine language. The answer is really very simple. When you call a *Graphics* mode the machine must store either 24 lines of *Graphics 0*, 4 lines for the window of another mode or 0 lines for a *Graphics* mode+ 16 (i.e. no text window). Location 703 is used for this purpose. All you need to do is call GR0 and POKE 703,4. When the display handle reads 703 it is forced to open device #8 as with any other mode with a window. This means you PRINT #6; to the top 20 lines and PRINT to the bottom 4 lines. Didn't I say it was simple?

If you have little memory to spare and want to try out *Player Missile Graphics* in single-line resolution do you realise that you can only use five players (four plus the combined missiles) maximum which means 5 x 256 bytes? As you need to start on a 2K boundary, you may think that there are 3 x 256 bytes wasted. Not at all. You can still store other bits of data here if you wish but, be warned, BASIC A+ uses this technique so be careful if you use this language.

Have you ever wished to add a utility to your program but cannot as both the utility and the program use the page 6 storage area? The answer is simple. Set one or both routines up as a string. For example

```
10 FOR I=0 TO 30: READ DATA: POKE
15,36+I*DATA: NEXT I
20 X=USR(15,36)
```

uses page 6. Try the following

```
10 DIM AS(31): READ DATA: AS(I)=CHR$(
)DATA: NEXT I
20 X=USR(ADR(AS))
```

Although you have used extra memory through the DIM statement, the routine itself has now become relocatable, i.e. the computer protects the string itself and will move it around in memory to do

so. Alternatively you could use

```
10 DIM AS(31): FOR I=0 TO 30: READ DATA:
POKE ADR(AS)+I*DATA: NEXT I
```

The FOR/NEXT - READ statements will take up a lot of space, so I suggest that once you have the string defined, delete the above lines and use the following after having RUN line 10 only.

```
PRINT AS (in direct mode)
Use the editing features to make 19 spaces before
the printed string and add
10 DIM AS(31): AS"
After the printed AS add - "X=USR(ADR(AS))
```

You can now delete all the DATA and save yourself some memory.

By taking this one stage further you could use X=USR(ADR(" assembly codes ") and save eight bytes by not using a string. By coincidence you can also save eight bytes each time you use POKE instead of SETCOLOR and, finally, using cursor control characters takes one byte each instead of the massive 15 for a POSITION statement.

I am now finding this column hard to compile. Not because I have nothing to write about but mainly because I am limited to one page and the articles I would like to include would take more room. What I need now is readers suggestions, either to me or the Editor, for page size articles. With your help I can explore the areas YOU wish to read about.

You will be reading this in September and, hopefully, I should be in sunny Florida in October. If you want any questions answered directly please write as soon as possible, otherwise you may have to wait many weeks for a reply.

Finally, I hope that by the time you read this I will have my last(?) FIRST STEPS TUTORIAL tape out. I hope that they have been of some benefit and, although they were designed for the beginner, I hope that the tapes included something for the more advanced.

Write to Mark at BAUG SOFTWARE, P.O. BOX 10, BELFAST, BT10 0DB

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Programming

RESET ROUTINES

One of the program routines which caused most interest appeared in Issue 6 in the game Scramble. It was a simple means of re-running a program on SYSTEM RESET. The routine shown would not work on the XL models but the following routine will.

```

10 POKE 2,52:POKE 3,185:POKE 4,217M#
1000
20 GRAPHICS 10:POSITION 1,0:7 M#*M#*
5 SYSTEM RESET*
30 GOTO 30
1000 REM
  
```

A more sophisticated SYSTEM RESET routine is given here. Unfortunately this will not work on the XL models. If anyone can come up with a fix, please let us know.

Cassette users should change lines 30 and 300 as follows.

```

20 I=ABS(0):R=INT(1/255):L=I-#056:PB
  M# 9,2:POKE 2,L:POKE 3,R:POKE 642,12:I#
  GRAPHICS 0
100 POKE 9,R:POKE 2,R:POKE 3,0:7 *M#M#
  PRESS THE SYSTEM RESET BUTTON*:END
  
```

Keep those prying eyes out of your program!

```

1 REM ***** SYSTEM RESET ROUTINE *****
2 REM M# 056 ESCAPE KEY TO EXIT M#
10 DIM B(149)
20 B#="***** M# 100 070-03- 0504 107M 107
  M# 0507 0507 M#*M#*
30 I=ABS(0):R=INT(1/255):L=I-#056:PB
  M# 12,L:POKE 12,R:POKE 642,12:GRAPHICS
  0
40 REM *****
500 REM ***** DEMONSTRATION *****
100 GRAPHICS 10
110 POKE 10,64:POKE 12776,64:REM DETAIL
  LE BREAK KEY
115 POSITION 6,4:7 M#:"*****"
120 POSITION 6,5:7 M#:" M#*M#*
130 POSITION 1,0:7 M#:"*****
  M#*
140 POKE 710,END:END
145 IF PEEK(7642)=20 THEN GOTO 100:REM
  ALLOW ESCAPE THROUGH ESC KEY
150 GOTO 100
200 REM *****
270 REM RESET POINTERS TO NORMAL
280 POKE 12,64:POKE 12,21:7 *M#M# PRESS
  THE SYSTEM RESET BUTTON*:END
290 REM
400 REM *****
500 REM ROUTINE IN DECIMAL FORM FOR
  INFORMATION
600 DATA 107,240,141,277,2,167,125,10,
  104,240,167,2,123,84,167,8,167,82,22,1
  64,240,167,83,22,104,240,167,70,22,164
  780 DATA 240,167,20,22,164,240,167,20,
  22,164,240,167,12,141,74,2,76,8,160
  
```

More **SCREENDUMPS** from a picture disk in the MACE library. Authors unknown.



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