

**The U.K. ATARI Computer Owners Club Issue 14 Price £1.00**

*Independent User Group*

# **Monitor**

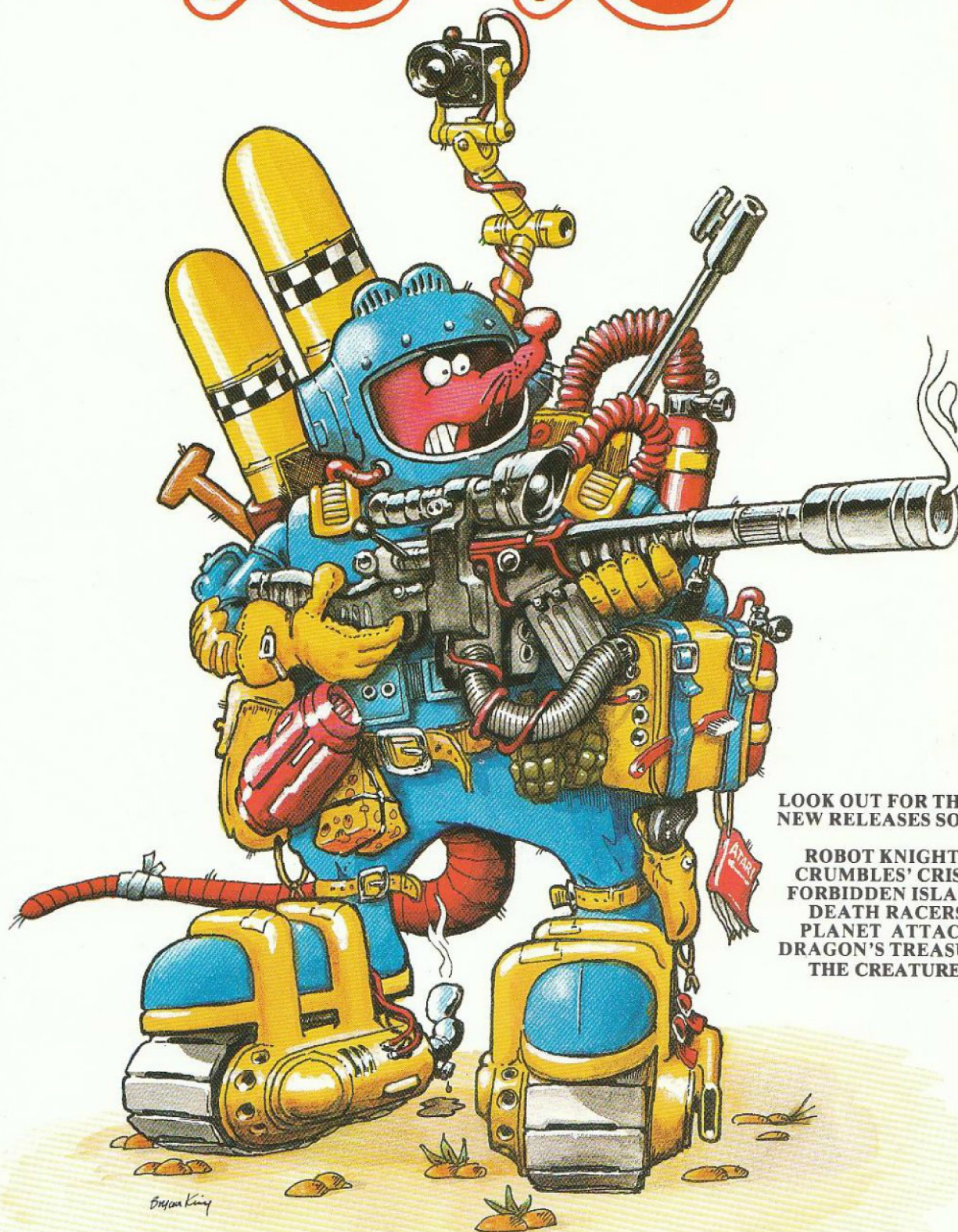
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**Molecule Man**  
**Domain of the Undead**

**ST REVIEWS**

# Red Rat



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## MINDS AT REST!

Over the last few months, we have had a number of members inform us of their concern that Monitor will be totally taken over by ST coverage. We would like to take this opportunity to assure you that this is far from the future we have planned for Monitor or the club. This club has always been dedicated to supporting 'Atari Computer Owners' and this must mean both 8-bit and 16-bit owners. We will be, and indeed are devoting some space to the ST, but there is no intention to see this coverage swamp the entire magazine. Ideally we would like to increase coverage of all aspects of Atari computing, the best way is by increasing the number of pages in each issue of Monitor. This costs though, and can only be achieved if membership/subscription is increased. We would also like to improve on the contents of the magazine. We feel that our review coverage is now excellent, but it is in other areas where we can still improve. We need you, especially the more experienced users, to send us articles and programs. We are sure that many of you have good, interesting and useful programs that you have developed for your own use that would be of a benefit to readers of Monitor. Send them to us, with a write-up on how they work, we will be delighted to receive them. Getting back to the question of ST coverage, we know that some older members have 'upgraded' to the ST, and some of our newer members are ST owners from the start. For them we hope they will understand the situation and stay with us in the knowledge that coverage will increase in the near future. And we hope the 8-bit owners who have supported the club for many years will continue to do so safe in the knowledge that 8-bit coverage will still feature strongly in the club magazine. So when you receive your re-subscription form, please fill it in and return it quickly; remember keeping the membership high is the most important factor in keeping your club and your magazine up to the standard it has achieved today!

Finally, a mention for a small user group based in Leytonstone, they would like to here from anybody with a special interest or usage for their Atari. Contact Glen Leader at SIGATARI, 143 Richmond Road, Leytonstone, London, E11 4BT.

### CREDITS

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	Keith Mayhew
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## Crystal Raider

Reviewed by Otis Bey

The object of the game is to collect all the quartz crystals in a complex of over 50 rooms. Why? Because if you don't you'll be dead, that's why! You start with five lives and one is lost every time you are caught by a nastie or you don't complete the room quickly enough and run out of oxygen. However, you do gain a life if you completely clear a room of crystals and move on to the next. The game is of the standard 'platform' type in which you must figure out the correct route to achieve your goal of clearing each room. These types of games are always entertaining and Crystal Raider is no exception. In fact, it has one feature which makes it different from the rest. You can play Crystal Raider at night! No, not when it is dark outside your window, but when you select night-time play and practically the whole screen goes black and your man is illuminated in a small yellow 'window' of his own. Playing the game is then much more difficult and puts it into the ranks of one of the best around.

Crystal Raider is marketed by Mastertronic, costs £1.99 and is available only on cassette as part of their budget range. This puts it well within the grasp of youngsters' pocket money and is therefore assured of doing well.



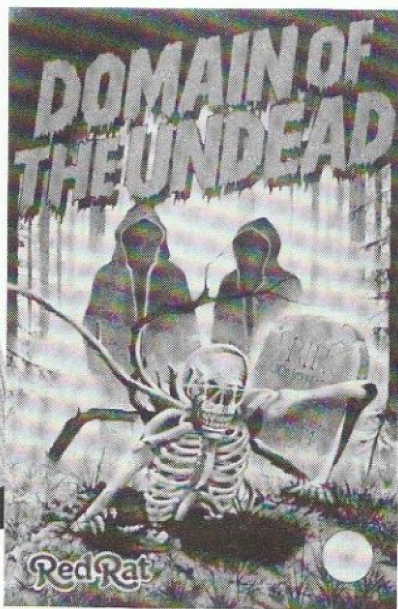
## Domain of the Undead

Reviewed by Brad Mountjoy.

In this game it is your unlucky task to have to venture into the moonlit graveyard to retrieve the master keys. Unfortunately the full moon's glow on the gravestones makes the skeletons, spooks and other nasties rise up and chase you. You do have some protection in the form of Anti-spectre bolts which you fire at the ghosties, in addition to having four crucifixes to ward off evil. As well as fending off the ghouls, you also have to contend with the vampire bats, flying creatures, lightning, gargoyles and claws that come up out of the ground at you.

On booting up the game you are treated to a graveyard scene with a musical intro which is a little bit on the long side, but not unpleasant to listen to in a morbid sort of way. Then its into the game proper. The skeletons are fairly well done, but the rest of the graphics won't win any awards. The colours are very dark and somber which doesn't help, but then what do you expect in the middle of a graveyard at dead of night?

Domain of the Undead is priced at £9.95 for disk or £7.95 for cassette. Although not the best from Red Rat Software, it is far from being bad and I am sure many who like this type of shoot-out game will find it great fun. Not a classic, but good entertainment and sure to keep Red Rat's reputation for quality games intact.

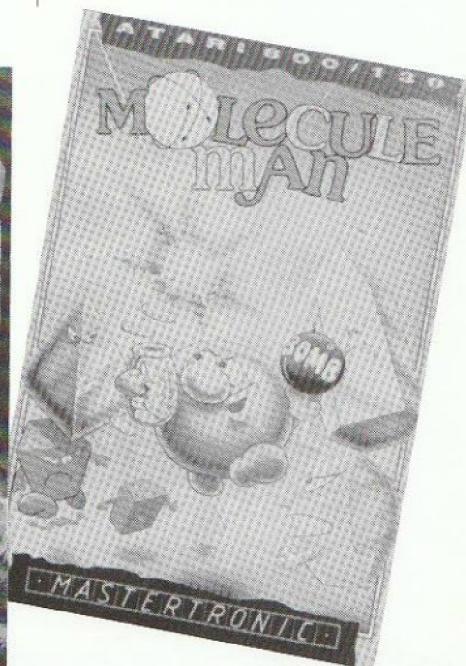


## Molecule Man

Reviewed by Otis Bey

You are the Molecule Man and you must make your way around the 3D maze trying to escape from the deadly radiation before it eats at your bones. Somewhere in the maze is a Teleporter which will transport you to freedom, however it seems to be broken. You must find 16 circuit modules to insert into the Teleporter to get it going again. Of course, time and radiation are against you in your search for the circuits, but there are caches of coins here and there which you can take. When you do though, you have to decide whether to spend the cash on Life Pills to keep you going, or Bombs which help you destroy parts of the maze so that you can get to bits of it that are inaccessible to you. Pressing 'X' explodes a bomb, 'B' buys the pills and the Fire button picks up things.

Molecule Man is part of the Mastertronic budget range at £1.99 and is only available on tape. The style of the graphics is a bit disappointing, the display is absolutely colourless and this makes it look very drab. It reminds me very much of early Spectrum games, all the shapes on the maze are drawn like outlines, very pretty and artistic outlines maybe, but still outlines when you get right down to it. Not really my sort of game, but at such a low price it is bound to sell well.



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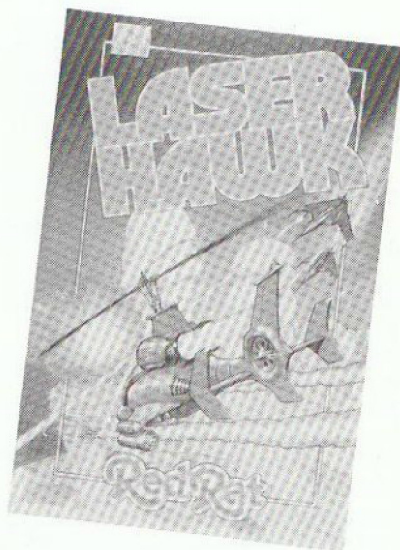
### Laser Hawk

Reviewed by Brad Mountjoy

Laser Hawk is a new helicopter shoot-em-up from Red Rat Software, the most prolific publisher of games software for Atari 8-bit computer owners in the U.K. at present. Most of their output is of extremely good quality and Laser Hawk is no exception.

Red Rat get no points for originality however, Laser Hawk does not break new ground in game concept in any way. Veteran Atari owners will recognise the similarity to Super Cobra and Airstrike. Where Laser Hawk scores is in the graphics and playability departments. My congratulations go to Andrew Bradfield for the programming and to Harvey Kong Tin for the super graphics.

For people unfamiliar with those older programs, a description of Laser Hawk follows. After the title screens, you find yourself in the role of mercenary Jim din'Alt, you dash from the Atari building to the waiting helicopter on the take off pad. Into the air you go and straight into the first scrolling landscape. From here the object is to get to end of



the level destroying buildings, avoiding falling meteorites, laser beams, air cannons, volcanic eruptions, flying missiles and many more. At the end of the zone you must destroy the Command Centre to move on to a new

level. There are five Command Centres named Beeb, Comm, App, Ams and Sin. Sound familiar? Each zone has floating fuel stations, you just pass your craft over them to replenish your tanks. Your craft is a Laser Hawk Class 1, but after destruction of the final Centre, your reward is to receive a new craft, the Hawk Star Cruiser, however those nasty Centres have rebuilt themselves, I guess you'll just have to start all over again.

Pressing Option selects 1 or 2 players, the second player using another joystick in Port 2. Select chooses between 1 to 4 levels and the Space Bar gives a pause game feature. Press 'B' for a beginners practice session in which you cannot be killed.

Laser Hawk costs £9.95 for disk or £7.95 for tape. It is very addictive, extremely playable and very good value for money. If you are new to this type of game, I strongly recommend you give it a try. If you are an old hand that has enjoyed this type of game before, I think you will still find Laser Hawk worth a look, if only for the excellent graphics.

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## The Colleen Music Compendium

Reviewed by Glissando.

When you look at the software market, the number of music programs is very sparse. There are a few that stand out from the crowd, such as The Advanced Music System from the States. It is quite surprising to find a new company from Wales trying to make an entry into this sparse market.

The product reviewed is a compendium of music programs, retailing for £49.95. Although the compendium occupies two sides of a disk, each program is available separately on a disk or a cassette. The programs are:

- The Colleen Music Creator Package (£19.95 & £14.95)
- The Colleen Play-along and Tutor Package (£12.95 & £10.95)
- The Colleen Guitar Tutor and Drum Machine (£12.95 & £10.95)
- The Colleen Music and Programming Tutor (£12.95 & £10.95)

The compendium is menu driven, with the keyboard and the joystick used for controlling the programs. Unfortunately, there does not appear to be a device within the various programs to allow you to go back to the main menu, thus it is very annoying to have to re-boot the system to access other choices from the menu. I did not find any problems in running all the programs using an old 800, or an XE. BASIC is required, so dig out the cartridge for the 800 and XE users, dry-boot.

### Music Creator

The essential features of this program are:

- 600 notes per voice.
- The ability to use all, or selected voices.
- Over 6 octaves Percussion sound effects freely mixed with each voice.
- Comprehensive Editing.
- Phasing effects with DE-TUNE.
- Note entry with a joystick.
- Icon driven.
- Music created is machine code, running during VBI and can be incorporated into your own program.

The keyboard occupies the upper half of the screen and the editing area is the bottom half. Icons are activated by the button of the joystick. For example, the PEN is the composer. After pressing the fire button a screen prompt appears

requesting the choice of voice. To select a note on the keyboard, move the joystick left or right and the active note is stepped through the range. When the chosen note is reached the button enters it into memory. The note value is selectable from a list of standard values.

There are two keyboards available, one for BASS and a STANDARD. During the creation of sounds, the phasing effect can be introduced at any time by pressing 'D'. Obviously it will be more effective if two, or more voices are playing the same note with one or more of them de-tuned. This is a novel way to get some very pleasing sounds — especially solos.

To listen to your wonderful efforts, select the PIANO icon and it is also possible to change the Release and Decay (the D & R of an A.D.S.R. waveform) according to a sliding bar. All voices can be paged individually. There are many other features in this program that I liked, especially the ability to save it in one of two ways. These are .MUS and .COL files. The .MUS files are used within the main program, your own creations to impress your buddies, or dear old Gran when she pays a visit, but the .COL files are the icing on the cake. These can be compiled into your own programs. The Music Creator is a very useful program utility as well as a source of entertainment. My verdict is that this program is very good value for money if you are considering purchasing it as an individual program. The documentation I had was pre-final, but it was very easy to follow my way through the program and I have no doubt that the final version will be as good, if not better.

### Tutors

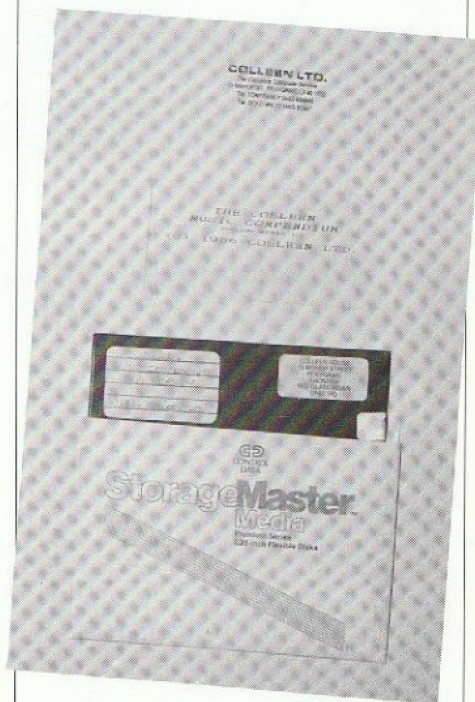
The flip side of the disk had another menu driven selection of musical programs. The Music Tutor is a very basic description of some of the fundamental music terms and expressions. The Guitar Tutor covers the chord shapes of many popular chords, including major, minor, diminished, etc. From this program a simple guitar tuner can be selected. The E, A, D, G, B, E notes are played, one at a time. The duration is controllable, there are no time pressures to hinder accurate adjustment of the guitar strings. I compared the accuracy of the generated tones to those from my pitch pipe and found they were acceptable.

I think that this little program, individually will be of some use to anyone wishing to learn the guitar. I

would have liked to see tunings and chord shapes for Open String Tuning techniques. There is quite a revival going on at the moment with Blues, Blue Grass and good ol' finger picking to warrant their inclusion. How about it, Colleen??

Play Along is a fun/educational program whereby you control the style of playing. The choices are limited to Boogie, Waltz, Disco and Country.

The Drum Machine may be useful to rhythm players. It is possible to set up 255 drum patterns and 255 phrases each holding 8 patterns. The drum sounds were not bad, but I have heard much better examples from other sources.



The Sound Effects program will be of considerable use to the serious programmer who wants to add acoustic colouration to his latest Sci-Fi creation. Many of the sounds that are already available from the menu are very familiar but there are a few new ones, too. The compendium version price makes it good value for money and you also have the choice of purchasing the program that you need, if your requirements are specific.

The programs are interesting and varied, as a music entertainment pack but when you consider the Utility value, it is very good.

# RICK HANSON

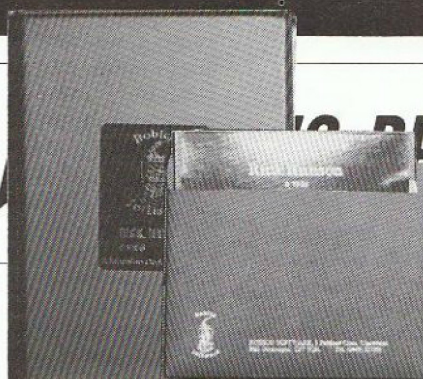
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## Rick Hanson

Reviewed by Claude Duval.

Rick Hanson is a disk based text only adventure from Robico Software. Rick is a special agent who's assignment is to assassinate an evil general and save the world from the final holocaust! Quite a task, I'm sure you'll agree. This is the first part of a trilogy of games which are being converted onto the Atari from the BBC. The other parts are called Project Thesius and Myorem. Rick Hanson was voted 'Best Electron adventure' and joint 'Best cassette-based BBC adventure' in the A & B Computing Adventure Awards for 1986. The Atari version is said to be even better, having 230 locations, about 70K of text, more objects and problems, a larger vocabulary and a more advanced parser. There is so much detailed text in fact that it is sometimes impossible to fit it all on one screen, so the prompt 'More' is given so you can read further on. The sophisticated parser allows you to type in upper or lower case, inverse letters, full sentences and multiple

statements. The program analyses your commands and acts on certain key words. The interpreter allows 'described objects' to be used, e.g. you may have more than one book, say a red book, a green book and a yellow book. Sentences such as: 'Get all the books except the red book then examine the green book and read it' would be understood. If you do not specify which book you mean however, the parser will assume that you are referring to the first one displayed. In our example, Get book would pick up the red book. Typing Get book again would be understood as pick up the green book, and so on. The part of the sentence which is being used will be displayed alongside a white circle. If any command fails you can then see where you went wrong and you can rephrase your sentence and try again. Multiple statements can be entered by separating them with 'and' or 'then' or with full stops or commas.

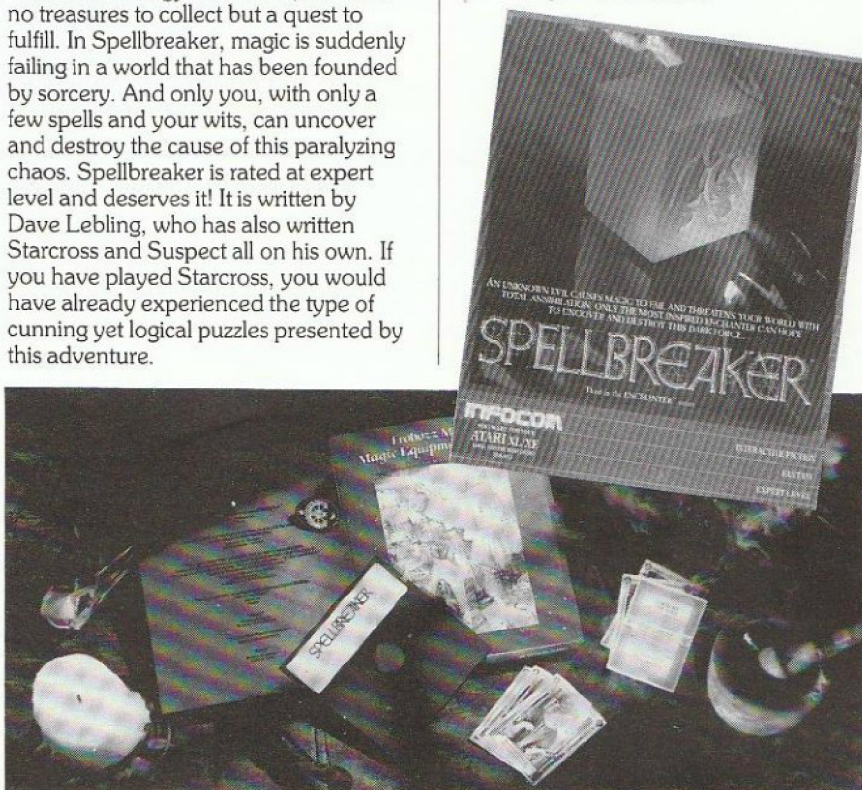
Other features include a save game option and upto 18 separate game positions can be saved on one disk. There is a Help section which gives you a list of useful words and phrases. Also supplied with the game are an adventurers notebook for mapping and recording your progress, a hint booklet and an instruction booklet. Rick Hanson is priced at £14.95 and be available only on disk. Further releases from Robico are planned and these include Island of Xaan in which you must escape from the King of Xaan's dungeon and leave his forbidding island; Blazing Star in which you play Marshall Dick Slade and you must hunt down Wild Zeke and the mean Maloney Boys in the old west of the early 1870's; and Enthar Seven in which you must reach the surface of Enthar Seven from the stricken hulk of the interplanetary Space Hopper before its orbit decays and you are spiralled into oblivion. They all sound excellent, look out for them!

## SPELLBREAKER

Sounds of sneezing brought my attention to a troll suffering from hay-fever. I have never been a keen gardener, but a little exercise with my magical green thumb and the troll and its treasures are soon departed. After a little splashing around in the sea, I returned to visit that cute little snake. Reducing its problem somewhat brought me to a strange temple and face to face with an ominous idol of a fierce beast, its single eye glows with a light of its own. With much reluctance, I live things up a bit,

This is a short account of my journey into *Spellbreaker*, the final chapter of the *Enchanter Trilogy*. As before, there are no treasures to collect but a quest to fulfill. In *Spellbreaker*, magic is suddenly failing in a world that has been founded by sorcery. And only you, with only a few spells and your wits, can uncover and destroy the cause of this paralyzing chaos. *Spellbreaker* is rated at expert level and deserves it! It is written by Dave Lebling, who has also written *Starcross* and *Suspect* all on his own. If you have played *Starcross*, you would have already experienced the type of cunning yet logical puzzles presented by this adventure.

A note to 800 owners: Although the packaging is labeled "ATARI XL", it will work on your old faithful.



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# CRACKING THE CODE

by Keith Mayhew Part Ten

*Last time the basic operation of player/missiles was covered. This time we conclude their study and start looking at how ANTIC's display lists are built up and used to create custom display screens.*

## Players Again

The program from last time demonstrated how image data is stored in a player table and displayed on the screen. Figure 1 shows the format of the player table expected by ANTIC. The first part of the table is not used for the creation of players or missiles and so this space can be used to store other data. The four missiles share the next part of the table, each taking two bits each with the four players occupying the rest of the table. The data from each segment of the table is displayed from top to bottom of the display as the memory locations increase (that is down the table as it is drawn). The figures to the left of the table refer to the offsets to the segments of the table for single line resolution mode.

In this mode the table occupies a total of 2K bytes with each segment containing 256 bytes to cover the screen display from top to bottom with each byte of data being displayed on one scan line.

The mode used in the program last time was double line resolution. This mode halves the size of the table to 1K bytes with 128 bytes for each segment; the offsets for this mode are shown to the right of Figure 1. In this mode each byte from the table is mapped onto two lines of the display, i.e. it is drawn twice in succession.

Although memory is saved by creating a less detailed image in the double line mode the vertical movement of the image will jump by two lines as it is moved a byte at a time up or down the table. To produce a smoother movement in this mode the vertical delay register, VDELAY, can be used. This register uses each bit to control a player or missile. Bits 0 to 3 correspond to missiles 0 to 3 and bits 4 to 7 correspond to players 0 to 3. By setting a bit the appropriate player or missile will be displayed after a delay of one scan line, i.e. it will be moved down by one scan line. Thus to create smooth movement of a player or missile in

double line resolution requires setting a bit in VDELAY for one movement down and then resetting it and moving the image down one byte in the table for the next movement of one scan line. Obviously the reverse of this rule applies when you wish to move the image up the screen.

The positioning of a player or missile horizontally is always by colour clocks. A colour clock is the smallest width which can be displayed in a single colour and is equal to the width of two pixels in the highest graphics resolution, e.g. graphics mode 8 from BASIC. We saw last time that the position of each player or missile was controlled by a separate register (HPOSPO-3 and HPOSM0-3), each increment or decrement in value thus causes the image to move by a colour clock; note that there is no corresponding horizontal delay register for finer movement. Whereas the positioning cannot be adjusted, the width of a player or missile can be adjusted by use of an appropriate size register. The registers SIZEP0-3 use bits 0 and 1 to determine the size of each player, the other six bits are ignored. A value of 0 or 2 will produce the normal

size for a player where each bit is one colour clock wide, i.e. 16 pixels in the highest resolution mode, a value of 1 doubles this width and a value of 4 doubles it again to four times the original width. The register SIZEM controls the width for each missile in exactly the same way with bits 0 and 1 referring to missile 0 and so on. Note though that horizontal positioning is still at each colour clock no matter what width has been selected.

What hasn't been mentioned so far is that the player table itself cannot reside anywhere in memory but must be aligned to certain boundaries. We shall see later that similar restrictions are placed on the positioning of information in memory, such as the display list, this was done for a simple reason: it simplified the design of ANTIC. Last time it was mentioned that PMBASE was the register which informed ANTIC of the location of the player/missile table. Internally ANTIC uses a 16-bit register to address the player/missile table, as the table is 2K in size in single line resolution mode ANTIC uses the bottom 11 bits of this register as an index into the table which leaves the top five bits to locate the table, i.e. the table must be on a 2K byte boundary. Similarly, in double line resolution mode, as the table is 1K the top six bits are used to locate it, i.e. the table must be placed on a 1K byte boundary. The top five or six bytes of the PMBASE register are thus used to load the internal register, depending on the mode. Note that the other bits in PMBASE will have no effect on the positioning of the player table so you must remember to position your table to the appropriate 1K or 2K byte boundary. Of course you can have more than one table in memory and switch between them at will.

The colours of the four players/missiles are determined by the contents of the four registers COLPM0-3. As the names of the registers suggest the colour value controls both a player and its associated missile. The actual

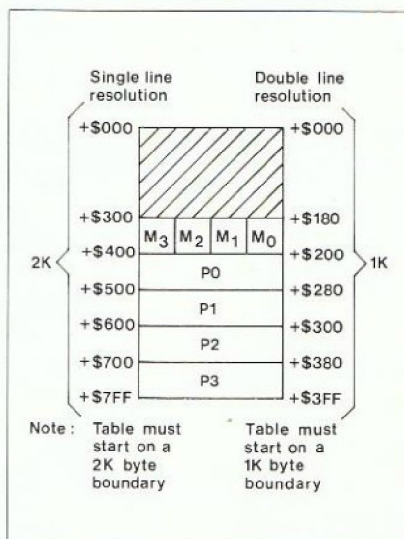


Figure 1. Player/Missile Table.

colour selected is determined by the top four bits of a colour register, the next three bits determine the intensity of the colour displayed. Note that the least significant bit has no effect on either the colour or the intensity of a player or missile.

The more interesting aspects of player/missile graphics are their priorities and 'collision' detection. The register PRIOR shown in Figure 2 controls how player/missiles are displayed.

The two top bits of this register determines which of the four modes GTIA works in: these will be described another time but for now it is sufficient to say that both bits set to zero is the 'normal' mode with the other three used in the display of graphic modes 9, 10 & 11 from BASIC. The rest of the bits are for player/missile control.

Bit 5, if set to 1, enables a third colour to be generated in the display of two players. The third colour is generated when the data for player 0 & 1 overlap, in this case the colour for the overlap region is determined by taking the colour register values for those players and ORing them together. The same process can independently occur for players 2 & 3 if they overlap, thus by careful selection of colour values it is possible to get 6 colours from the four players. Bit 4, if set to 1, sets the colour of the four missiles to that of COLPF0-3. The idea here is that if the four missiles are positioned side by side they form a 'fifth player' which has a colour independent of the other four players. The last four bits are used to determine the priority of players over each other and the background colours, thus enabling the effect of passing objects over one another. The exact operation of these priorities will probably be described next time.

There are sixteen registers in GTIA for detecting 'collisions' of players and missiles with the background or 'playfield'. A collision simply implies that the display of a player or missile is overlapping with the display of a playfield colour. The registers P0-3PF show the collision of players 0 to 3 with playfield colours respectively, similarly M0-3PF show the collision of missiles 0 to 3 with the playfield colours. Bits 0 to 3 in each register, if set to 1, indicates a

collision with playfield colour 0 to 3 respectively. As an example, if bit 2 was set in P3PF it would indicate a collision (overlap) between player 3 and playfield colour 2.

Registers M0-3PL indicate collisions between missiles and players and P0-3PL indicates collisions between players and players. Bits 0 to 3 now refer to players 0 to 3 respectively, but note that in the player-to-player registers that a player does not collide with itself! That is bit 0 of P0PL will always be zero as will bit 1 of P1PL, etc.

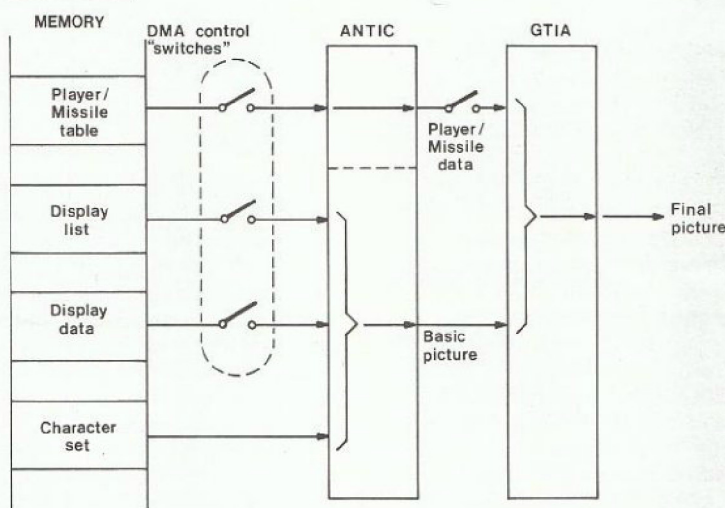
If anything is written to the register HITCLR then all the bits in the collision registers will be set to zero, this is necessary because collisions are not cleared automatically. This means that the safest way of using the collision

registers is to always write to HITCLR just before you read them otherwise collisions will get ORed together. Of course you could always compute for yourself if objects overlap but the hardware is much quicker.

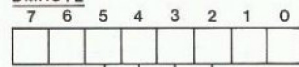
## The Rest of the Display

The display is built up, as mentioned before, of the combination of ANTIC's display and GTIA's colour and player/missiles. Figure 3 shows the four sections of memory which are accessed by ANTIC's DMA to create the display information which is passed onto GTIA. The 'switches' shown correspond to bits in an ANTIC or GTIA register which controls whether data is fetched or not. It can be seen that for player/missiles to be displayed two switches must be closed:

### ANTIC'S DMA



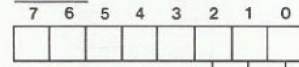
### DMACTL



0 0	No data fetched
0 1	128 colour clocks of data
1 0	160 colour clocks of data
1 1	192 colour clocks of data

- Enable Missile DMA if set to 1
- Enable Player DMA if set to 1
- Single or Double player resolution if set to 1 or 0 respectively.
- Enable display list DMA if set to 1.

### GRACTL



- Enable display of Missile DMA data.
- Enable display of Player DMA data.
- Latch "trigger" values if set to 1.

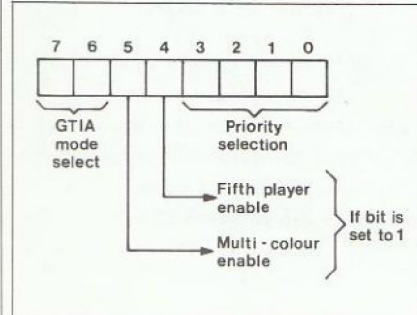


Figure 2. PRIOR Register.

Figure 3. ANTIC's DMA.

the first switch allows ANTIC to actually fetch the data from memory and the second allows the data to be placed in GTIA's registers. Bits 2 & 3 of DMACTL control the fetch of missile and player DMA respectively and bits 0 & 1 of GRACCTL control the display of the missile and player DMA data respectively. Bit 4 of DMACTL selects whether data is fetched for single or double line resolution when player or missile DMA is enabled.

Bit 2 of GRACCTL controls the 'latching' of the trigger values for the joysticks. This has nothing to do with the display but as the bit was put in this register it will now be explained! Normally bit 2 of GRACCTL will be zero, this means that the four trigger values from the joysticks will be directly readable from TRIG0-3 with bit 0 of each indicating the button is pressed if its value is zero and that the button is up if its value is one. However, when bit 2 of GRACCTL is set to 1 and a button is pressed the value in the appropriate trigger register will go to zero and stay there even if the button is then released, i.e. it has been latched. The value can be reset again to one by writing 0 to bit 2 of GRACCTL and then setting it back to 1 if you still want values latched. I should point out at this stage that on machines with only two joysticks the other two trigger lines (TRIG2 and TRIG3) are used for other purposes.

Coming back to the display, ANTIC reads a 'program' known as the display list to tell it how to build up the display (playfield). Bit 5 of DMACTL must be set to 1 for this operation to occur. Bits 0 & 1 of DMACTL determine how ANTIC, as instructed by the display list, fetches actual display data. If both bits

are zero then no display is generated, the other settings create a display of three different widths. The usual setting of bits 0 & 1 is 1 and 0 respectively producing a screen of 160 colour clocks.

Before we move on to look at the display list it is worth remembering that all DMA operations by ANTIC stops the 6502 from processing periodically. Thus if player DMA is enabled but the player is not wanted then the processor is being slowed down unnecessarily; so it is usually best to turn off any DMA you are not using. It is rare that you will want to turn the display list or display data DMA off because it will result in a blank screen. However, when display DMA is on, the processor will run faster when ANTIC has to fetch less data, so lower resolution screens will mean faster program execution; much faster if there is no screen at all — but I don't think it will catch on for fast games!

Listing 1 is a simple program which sets up a new display list for ANTIC to use. If Listing 2 is typed in and run it loads in the code; the program is run by typing:

X=USR(1536)

This produces a screen showing one of each of ANTIC's mode lines then one blank line and all the mode lines again in reverse. The program then runs in a loop writing random data over the screen until a control key is pressed. Note that when it stops running you can still type commands to BASIC — you just will not see them because you are looking at a new display.

Looking at Listing 1, the first thing the program does is to save the address of DLIST into SDLSTL and SDLSTH. These are the operating system shadows

of the hardware registers DLISTL and DLISTH. Once the hardware registers have been updated with this new address, i.e. after the next vertical blank, then ANTIC will start using the display list defined from line 390 to 490. Table 1 shows all the instructions which can be used in a display list. The first type of instruction is the 'display data': this tells ANTIC to display a line of data in one of the 14 modes available. Modes 2 to 7 are character mapped while modes 8 to \$F are bit mapped. The table shows the number of characters or pixels a line occupies assuming a standard width screen of 160 colour clocks, i.e. DMACTL bits 1 & 0 set to 1 and 0 respectively. It also shows how many colours can be selected from that mode and how many scan lines high the line will be.

With each mode line any combination of the top four bits can be set to achieve scrolling, interrupts or to load the memory scan-counter. This latter flag is essential to tell ANTIC where to find its display data which will fill each subsequent mode line. Line 390 of Listing 1 defines a display instruction for mode 2 with its Load Memory Scan-counter (LMS) flag set. This causes ANTIC to load its scan-counter with the following two bytes. These are defined on line 400 with the .WORD directive which takes the address DISPLAY and stores it in low/high byte order. These first three bytes of the display list will cause ANTIC to display a mode 2 line using data from the address DISPLAY. The next two lines define display instructions for the modes from 3 to \$F with no flags set. This will make ANTIC display these lines using data following on from where the first line finished, this

0100 ;Hardware register equate...	0300 LDA RANDOM ;Random number.
0110 CONSOL = \$D01F ;Consol keys.	0310 STA DISPLAY,X ;Save in display.
0120 RANDOM = \$D20A ;Random number.	0320 LDA RANDOM ;Another random number.
0130 ;Operating system shadows...	0330 STA DISPLAY+256,X ;Save in display.
0140 SDLSTL = \$0230 ;Display list pointer low.	0340 LDA CONSOL ;Consol status.
0150 SDLSTH = \$0231 ;Display list pointer high.	0350 CMP #7 ;All up?
0160 ;Display list instructions...	0360 BEQ LOOP ;Yes - continue.
0170 JMP = \$01 ;Jump instruction.	0370 RTS ;Else back to BASIC.
0180 WVB = \$40 ;Wait for vertical blank flag.	0380 ;Display list data...
0190 B1 = \$00 ;Blank 1 line instruction.	0390 DLIST .BYTE 2+LMS ;Mode 2 & load counter.
0200 LMS = \$40 ;Load memory scan flag.	0400 .WORD DISPLAY ;Address of display.
0210 ;Program equate...	0410 .BYTE 3,4,5,6,7,8,9 ;Modes 3 to 9.
0220 DISPLAY = \$4000 ;Start of display memory.	0420 .BYTE \$A,\$B,\$C,\$D,\$E,\$F ;Modes A to F.
0230 *= \$0600 ;Another page six program...	0430 .BYTE B1 ;Blank 1 line.
0240 PLA ;Clean stack.	0440 .BYTE \$F+LMS ;Mode F & load counter.
0250 LDA #DLIST+\$FF ;Low address of new	0450 .WORD DISPLAY ;Address of display.
0260 STA SDLSTL ; display list and save it.	0460 .BYTE \$E,\$D,\$C,\$B,\$A ;Modes E to A.
0270 LDA #DLIST/256 ;High address of new	0470 .BYTE 9,8,7,6,5,4,3,2 ;Modes 9 to 2.
0280 STA SDLSTH ; display list and save it.	0480 .BYTE JMP+WVB ;Jump on next vertical blank.
0290 LOOP LDX RANDOM ;Random index.	0490 .WORD DLIST ;Address of start.

```

QZ 10 DIM HEX$(16)
CV 20 LINE=10000:TRAP 100:J=0:START=1536
VA 30 READ HEX$,CHKSUM:SUM=0
AA 40 FOR I=1 TO 15 STEP 2
ZG 50 D1=ASC(HEX$(I,I))-48:D2=ASC(HEX$(I+
1,I+1))-48
KT 60 NUM=((D1-7*(D1>16))*16+(D2-7*(D2>16
)))
LW 70 SUM=SUM+NUM:POKE START+J,NUM:J=J+1:
NEXT I
LY 80 IF SUM=CHKSUM THEN LINE=LINE+10:GOT
O 30
IN 90 ? "Checksum error on this line:"
VO 95 LIST LINE:END
YS 100 PRINT "Data in memory."
NK 10000 DATA 68A9228D3002A906,673
TN 10010 DATA 8D3102AE0AD2AD0A,769
JE 10020 DATA D29D0040AD0AD29D,981
UO 10030 DATA 0041AD1FD0C907F0,925
YC 10040 DATA EA60420040030405,472
OK 10050 DATA 060708090A0B0C0D,76
AD 10060 DATA 0E0F004F00400E0D,199
PD 10070 DATA 0C0B0A0908070605,68
JS 10080 DATA 040302412206,114

```

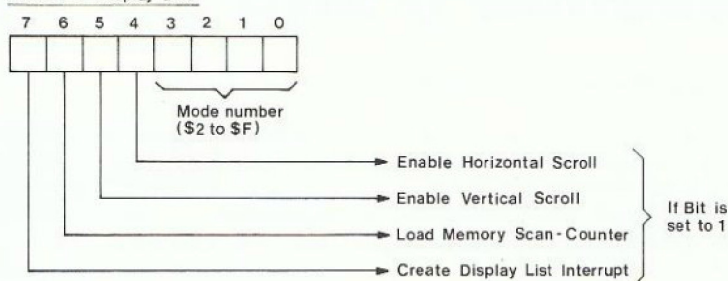
#### Listing 2.

is because the scan-counter is incremented after each byte of display data is fetched and unless it is re-loaded with another LMS flag the display data will remain contiguous. Line 430 defines another display instruction which simply produces a single blank scan line on the screen. This second type of instruction can in fact produce anything from 1 to 8 blank lines depending on a three bit count value as shown in Table 1. Although this type of instruction will not cause any data to be fetched, i.e. the scan-counter will not be changed, the interrupt flag can still be set — in fact any ANTIC instruction can cause a so-called display list interrupt if it has bit 7 set as will be described next time.

Lines 440 to 470 defines all the mode lines again but in reverse order. Note that the LMS flag has been set on line 440 so the scan-counter will be re-loaded with the address of DISPLAY. This means that these mode lines will look at exactly the same data as the first 14 except it will be displayed in a different mode. It is common only to have one LMS in a display list but there is nothing to stop you re-loading the scan-counter on every line and thus make the screen data non-contiguous.

After ANTIC has produced a single frame using this data it will then execute the instruction on line 480. This is the third type of instruction shown in Table 1 and causes ANTIC to re-load its display list pointer. In this example the address of the start of the display list follows this instruction so ANTIC goes

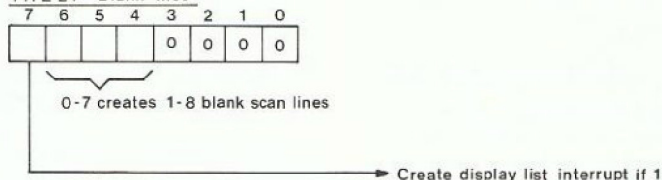
TYPE 1 :- Display data



Mode No. (hex)	No. of Characters *	No. of Colours	No. of Scan Lines
2	40	2 <sup>†</sup>	8
3	40	2 <sup>†</sup>	10
4	40	4	8
5	40	4	16
6	20	5	8
7	20	5	16
No. of Pixels *			
8	40	4	8
9	80	2	4
A	80	4	4
B	160	2	2
C	160	2	1
D	160	4	2
E	160	4	1
F	320	2 <sup>†</sup>	1

\* = Assumes "standard" width screen of 160 colour clocks.  
<sup>†</sup> = Actually one colour with two luminances.

TYPE 2 :- Blank lines



TYPE 3 :- Jump

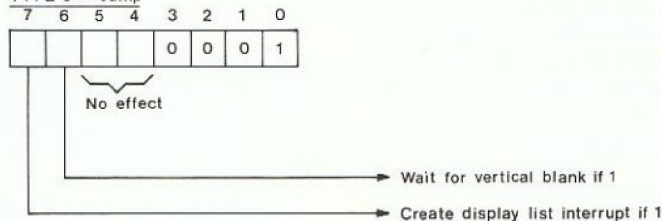


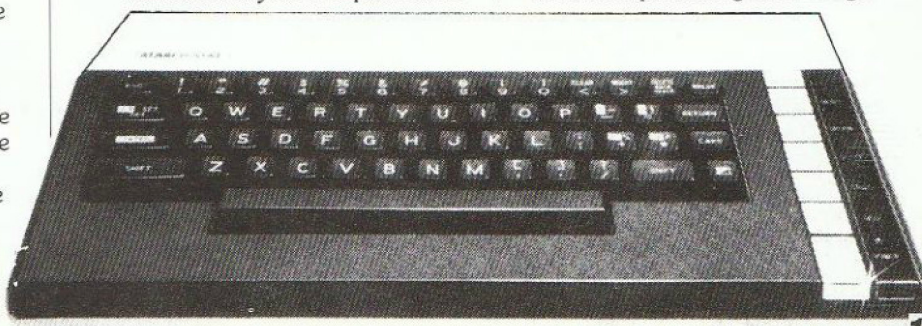
Table 1. ANTIC Display List Instructions.

back to start displaying it all over again. Before ANTIC starts re-displaying the information it waits for the next vertical blank to occur because the 'WVB' flag had been set. This has the effect of synchronising each frame so as to produce a stable display.

As has already been explained the

program goes around in a loop saving random data at a random position in the 512 bytes starting at DISPLAY thus causing the displayed data to keep changing until a consol key is pressed.

Next time we will look at display lists in more detail and discuss scrolling and interrupts among other things.



# Adventure into the ATARI by Steve Hillen

## Part 3 in writing your own adventure.

The parser of an adventure game is one of the most important sections of the program. Its function is to convert the sentence that is typed in into a series of reference numbers which can then be used by the rest of the program.

Analysing simple commands such as 'TAKE BOOK' is pretty straightforward, but how about more complex ones such as:

'TAKE THE BOOK FROM THE OLD MAN'

Certain commercial games rely on the standard verb-noun structure which is very easy to understand and use. (In fact, a parser of this style in machine code and BASIC was described in issue 12 of Monitor.) Nowadays, though, we expect to have games that can seemingly understand a vast selection of words and sentence constructions.

There are two main methods available. The first is typified by Synapse's Mindwheel which can understand well over 1000 words. This method analyses a sentence by scanning along the line, trying to match each word it comes across with a long reference list. It does not take too much account of sentence structure; it just grinds through the sentence, converting it into a series of numbers. As long as enough words are understood, any extraneous ones are ignored. This is probably acceptable with massive vocabularies, but it doesn't suit our purpose; suppose we ignored the word NOT in the following command:

DO NOT KILL THE RABBIT

It would read as KILL THE RABBIT, clearly not what we meant.

As you would expect, Infocom have a rather better solution. The vocabulary is decreased (about 600 words) but instead there are a series of acceptable sentence structures. If the sentence does not conform to a particular structure, or if any word is unrecognised, then the command is rejected. In most cases, this is a lot safer as the sentence is very unlikely to be misinterpreted.

Two issues ago I described a short program that analysed verb-noun or single-letter inputs. It is surprising how often this is all that is typed in, even with advanced sentence analysers. It also has the advantages of being easy to use, compact and fast.

However, if this isn't good enough for you, you might consider using the parser described below. On considering what sort of sentences were likely to be needed, I designed a parser to work

around the following parameters.

A typical sentence contains a verb, adjective/noun (direct), preposition, adjective/noun (indirect) along with a load of useless words such as: the, a, and, an, etc. If you think about it, a command sentence almost always starts with a verb. It may or may not have direct or indirect objects with associated adjectives. However, the indirect object will always immediately follow the preposition. Before coding up the parser, I made the following simplifications.

- A sentence always starts with a verb.
- An adjective always precedes a noun.
- The indirect object always follows the preposition.
- Any other noun is the direct object.
- No lists are allowed, e.g. TAKE DOG, BOOK, KNIFE.
- No multiple sentences joined by punctuation marks or AND etc.
- Words are recognised by the first five letters only.
- Any number of words can be recognised, i.e. no limit of 255.

These limitations still allow sentences of the form:

verb [adj, noun, prep, adj, noun] or  
verb [prep, adj, noun, adj, noun].

These sentences can successfully be reduced to a series of numbers which can then be acted upon. The program is also compatible with the data compressor from last time.

The listing below contains the sentence-analyser program and you will notice that it has three machine code routines for speed.

ML1 searches down a specified table to try and match a five letter string with one of the entries in the table. It counts down the table backwards, i.e. the last entry is in fact entry number 1. If a match is not found, the value 0 is returned.

ML2 searches from a given address for a given number of bytes for a given character. Zero is returned if no match is made.

ML3 does the same as ML2 except that it searches for the first occurrence of any character except for the one given.

In this case, the latter two routines are used to search for the space at the end and beginning of each word.

The actual parser routine to extract a word from the input string defines rational description, I don't really know how I got it to work (lines 500 - 560). It automatically ignores words such as THE, A and AN. The main work is done by lines 1000 - 1110. Figure 1 is a flow-chart of roughly what is going on here.

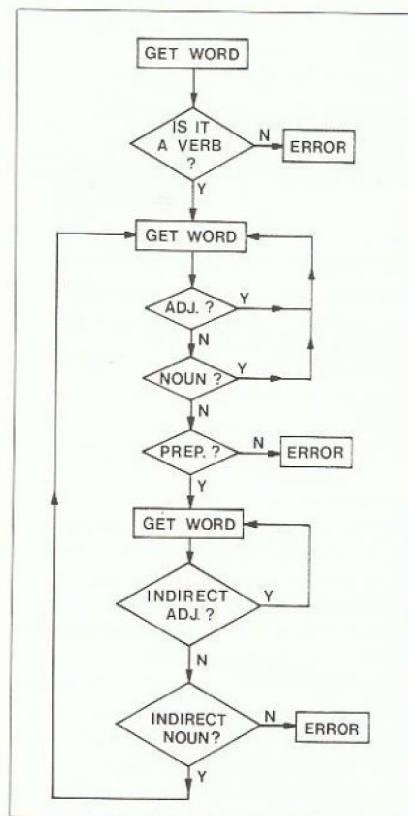


Figure 1. Flowchart.

Below is a description of all the variables in use in the program:

- V\$ = contains a list of 5 letter abbreviated verbs (no limit to number).  
 N\$ = a list of shortened nouns.  
 A\$ = a list of abbreviated adjectives.  
 P\$ = a list of shortened prepositions.  
 U\$ = a list of useless words.  
 ML1, ML2, ML3 = the addresses of the 3 machine code strings.  
 ML1\$, ML2\$, ML3\$ = the machine code strings.  
 NV = number of recognised verbs (no limit).  
 NNN = number of nouns.  
 NA = number of adjectives.  
 NP = number of prepositions.  
 NU = number of useless words.  
 IN\$ = the input string.

A = address of IN\$-1.  
 L = length of IN\$+1.  
 K\$ = where the 5 letter word is kept before comparing it with the tables.  
 GW = the routine Get Word.  
 X = a counter to index into IN\$.  
 C = same as X.  
 V, AJ, NN, P, IAJ, INN = the numbers corresponding to the positions within their respective tables of the verb, adjective, noun, preposition, indirect adjective, and indirect noun.

Well, that's about it. It is now relatively simple to use this in the same manner as the parser described in Issue 12. Type it in and play around with commands such as:

```
N
GO NORTH
GO NORTH TO THE BLUE CHAIR
```

If you're keen, try to get a few verbs working (see Issue 12), but in case this article has left you far behind, we'll be back down to earth next time with a short article on screen displays and possibly a complete working adventure to type in, play, and study. In the meantime, I'd be grateful for any comments or suggestions on this adventure-writing business.

```
IV 10 GOTO 4000
NH 496 REM *****
TR 497 REM Get a word routine and throw
KM 498 REM out any useless ones.
NQ 499 REM *****
ER 500 X=USR(ML3,A+C,L-C,32)
XO 510 Y=USR(ML2,A+C,X,L+5-C-X,32)
WU 520 IF C+X+Y>L THEN POP:GOTO 2000
LC 530 K$(1,5)="      ":K$=IN$(X+C,Y+C+X-1)
DI 540 C=C+Y+X
MB 550 IF USR(ML1,ADR(U$),3,ADR(K$)) THEN
500
ZN 560 RETURN
NM 996 REM *****
MJ 997 REM Get user input, then analyse
ZN 998 REM the words.
NV 999 REM *****
UU 1000 C=1:"Well ";:INPUT IN$:A=ADR(IN$)-1:L=LEN(IN$)+1:IN$(L,L)=" "
YP 1010 GOSUB 6W
YF 1030 V=USR(ML1,ADR(V$),NV,ADR(K$)):IF
NOT V THEN ? "Is ";K$;" a verb?":GOTO
0 3000
YY 1040 GOSUB 6W
EE 1050 W=USR(ML1,ADR(A$),NA,ADR(K$)):IF
W THEN AJ=W:GOTO 1040
HD 1060 W=USR(ML1,ADR(N$),NNN,ADR(K$)):IF
W THEN NN=W:GOTO 1040
```

```
FW 1070 W=USR(ML1,ADR(P$),NP,ADR(K$)):IF
NOT W THEN ? "What does ";K$;" mean?
":GOTO 3000
JG 1080 P=W
ZN 1090 GOSUB 6W
WH 1100 W=USR(ML1,ADR(A$),NA,ADR(K$)):IF
W THEN IAJ=W:GOTO 1090
RJ 1110 W=USR(ML1,ADR(N$),NNN,ADR(K$)):IF
W THEN INN=W:GOTO 1040
SN 1996 REM *****
CP 1997 REM Print out word numbers -
AV 1998 REM normally deal with verbs here
SZ 1999 REM *****
GO 2000 ? :? "verb=";V
XH 2010 ? "adj=";AJ
FL 2020 ? "noun=";NN
DU 2030 ? "prep=";P
DE 2040 ? "iadj=";IAJ
MN 2050 ? "inoun=";INN:
YK 2060 IF V THEN X=NV-V: V$(X*5+1,X*5+5)
);
IO 2070 IF AJ THEN X=NA-AJ: A$(X*5+1,X*5+5)
);
GD 2080 IF NN THEN X=NNN-NN: N$(X*5+1,X*5+5)
);
HR 2090 IF P THEN X=NP-P: P$(X*5+1,X*5+5)
);
JC 2100 IF IAJ THEN X=NA-IAJ: A$(X*5+1,X*5+5)
);
PY 2110 IF INN THEN X=NNN-INN: N$(X*5+1,X*5+5)
);
NO 2120 ?
IH 2500 REM
QL 2501 REM *****
LB 2502 REM Try something like
VE 2503 REM GOTO 6000+200*V
TY 2504 REM to get to each verb.
RB 2505 REM *****
JF 2506 REM
YO 3000 V=0:AJ=0:NN=0:P=0:IAJ=0:INN=0:GOT
0 1000
SP 3996 REM *****
BK 3997 REM Set up the strings and
YU 3998 REM machine code.
TB 3999 REM *****
GE 4000 DIM V$(300),A$(300),N$(300),P$(300),U$(300),K$(15),IN$(100),ML1$(67),ML2$(30),ML3$(30)
DF 4010 FOR A=1 TO 66:READ D:ML1$(A,A)=CHR$(D):NEXT A:FOR A=1 TO 30:READ D:ML2$(A,A)=CHR$(D):NEXT A
UK 4015 FOR A=1 TO 30:READ D:ML3$(A,A)=CHR$(D):NEXT A:ML1=ADR(ML1$):ML2=ADR(ML2$):ML3=ADR(ML3$):GW=500
SU 4020 V$="EXAMIGET GO LOOK READ SEARCTAKE TURN N S E W U D":NV=LEN(V$)/5
DX 4030 N$="DOOR CHAIRCLOCKKNIFEAXE COINWALLEBOWL FRUITICE N S E W NORTHSGOUTH":NNN=LEN(N$)/5
JM 4040 A$="RED BLUE YELLOBIG ":NA=LEN(A$)/5
```

```
MM 4050 P$="TO FROM UNDERON IN ":NP=LEN(P$)/5
JM 4060 U$="THE A AN ":NU=LEN(U$)/5
NM 4070 GOTO 1000
YT 5000 DATA 104,104,133,209,104,133,208,104,133,213,104,133,212,104,133,211,104,133,210,160,0,177,208,209,210
EG 5001 DATA 240,31,165,208,24,105,5,133,208,144,2,230,209,165,212,56,233,1,133,212,165,213,233,0,133
XI 5002 DATA 213,208,222,165,212,208,218,96,208,192,5,144,214,132,203,96,104,104,133,211,104,133,210,104,104
QS 5003 DATA 170,104,104,160,0,132,212,13,2,213,209,210,240,5,200,202,208,248,96,132,212,96,104,104,133,211
HI 5004 DATA 104,133,210,104,104,170,104,104,160,0,132,212,132,213,209,210,208,5,200,202,208,248,96,132,212,96
```

Listing 1.

## NEWSBIT

Reprinted from the SLCC Journal.

### NEW EMULATION SYSTEM FOR AMIGO

Commode Business Machines, in a move believed intended to spur sales of the new Amigo, has announced a new emulator product for the computer. The new product allows the Amigo to emulate one of Commode's previous best-sellers, the TRIC-20. The device attaches to the Amigo's expansion bus and features cartridge slots, a cassette Interface port and 5K of RAM.

"We think this device greatly increases the flexibility and versatility of the Amigo," gloated Rick Geigerkounter, Amigo general manager. "With our multi-tasking feature, we can have up to eight TRIC-20 programs running at once. This allows us to take advantage of the large library of TRIC-20 software. It also rids us of those annoying system crashes."

Also excited about the new product was Flip Gawkins, president of software publisher Electronic Warts. "We are considering TRIC-20 versions of our Amigo software line, such as Deluxe Crayola, Two on One and the Drywall Construction Set. This way we can sell these products both to new Amigo buyers and to the TRIC-20 market. I think this proves my point that the Amigo is the computer of the future."

Industry rumour monger Jerri Lewis of Dataquash in San Jose saw the release of the emulator as a move to gain sales for financially troubled Commode. "In their position, they need to keep releasing new products. Otherwise, the Amigo's chances are, well, straight down the commode."

## THE MUSIC STUDIO.

Reviewed by Mike Stringer

This piece of software was developed by Messrs Forrester, Hospelhorn, Parfitt, Wickman and the manual by Elizabeth Armstrong, collectively known as Audio Light Inc.

This is one of the first musical packages, containing a MIDI application, to reach the market place. It is well packaged and documented, in fact the manual is outstanding, covering every aspect in great detail – which is the reason for including the manual's author in the credits.

This program is not intended as a MIDI orientated program, but has MIDI included as a feature. It is surprisingly versatile, scoring well on both entertainment and education value. To list all the features and its capabilities would be pointless, but some of the major features will be covered.

The Music Studio is a composing utility whereby, with the mouse, you can create a library of sounds, instruments and effects for the ST. A large number of ready-made sounds are included, with the facility of adding to these. Music can be composed and notes can be allocated different sounds – up to a maximum of fifteen, from the sound library.

The composing, editing and storing of music, with the option of adding lyrics and even printing the scores out for a hard copy, are also possible. By adding a MIDI compatible instrument the ST is turned into a very powerful sound generator. By clicking on the right mouse button, you enter the PAINTBOX screen. Here, there is a very large stave for Treble and Bass. Beneath this is a palette and various paint brushes for the creation of sound patterns. This aspect is particularly useful for very young children who are learning music and the relationship of sound shapes. Similarly, an adult keen on learning music will find this very useful.

Notes can be entered via the MIDI keyboard or the mouse. The type of note, crotchet, quaver, etc, is chosen before entering on the stave, selected from a pull down menu, remaining active until changed. Most musical notations are available including sharps, flats, rests, dotted notes and triplets. As the note is entered, it is identified in a small box at the top of the screen. Chords, or columns, as they are referred to in the manual, are limited to three when the ST sound generators are used, but if a MIDI instrument capable of playing 6, 8 or 16 notes in the

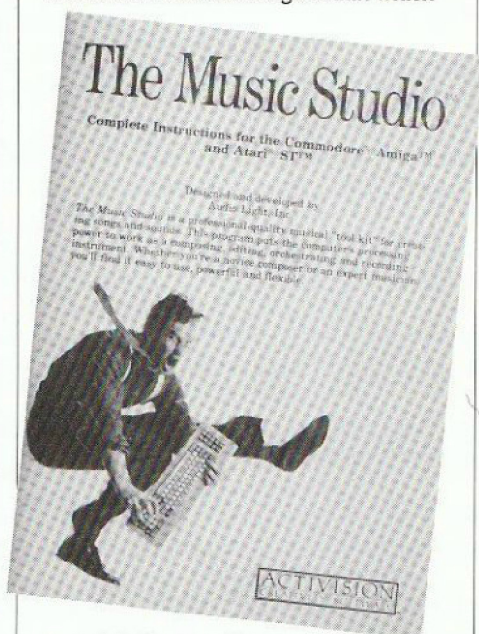
polyphonic mode is employed, the chord can accept them. One has to relocate the mouse pointer over or under the note each time as the chord is built up. This is fiddly, but adequate.

The sonic range for the ST is at least 6 octaves and with a MIDI instrument the full range of 127 notes, or 11+ octaves is possible. There are five screens within which one works: the COMPOSING screen, INSTRUMENT DESIGN screen, MIDI PARAMETERS screen and the FILE screen. These are entered via pull down menus at the top, the de-fault screen is the main composing screen. The instrument design screen allows you to create, name and file sounds for the ST sound generator. The Midi parameters screen allows one to select the MIDI voice, channel and octave range within which

are two options: play with or without scrolling. These are selected from the icons at the bottom of the screen, the EAR is for listening only and the RUNNING NOTE scrolls the score as it is being played. Some of the .SNG files are quite good, considering that they have been designed around simple, three note chords. Of course, it is very easy to EDIT these melodies for playing, via MIDI, on a polyphonic synthesiser where up to sixteen notes can be handled. The program's signature tune is quite catchy but the excerpts from Bach's Brandenburg Concerto, Pachelbel's Canon and the Star Spangled Banner are very good. In using the main composing screen the voice, or instrument, is chosen from the small coloured box at the top of the screen. This box opens a menu of 15 sounds – each with its own colour. In the information box next to it, the name of the voice appears.

In the adjacent box, with an icon in the form of a crotchet, another menu will drop down and a note can be selected. The normal mouse pointer now changes to that of the note and also to the colour of the voice. If the mouse now scans the central composing area in the vicinity of the staves, the pitch will change as the pointer goes up and down the stave. By placing the pointer to the voice icon – another voice can be selected. Some of the voices included are: Bass, Piano, Snare, Guitar, Clarinet, Flute, Harmonica and Vibes. Considering the very poor sound generator of the ST, they are not too bad! After a little experimenting, you will quickly become familiar with the sounds that are available. By loading up some of the included pieces of music you will come across many others, plus you can also create your own.

If possible, acquire some sheet music from a store, or your local library and try to compose your own arrangements. Remember, if you don't have access to a MIDI instrument, you will have to limit the number of notes in a chord to three. Try to develop the habit of entering the notes of one voice, perhaps the theme, then change the voice and go back and enter the accompaniment. Where passages are repeated, whole sections can be blocked off and a click on the button will cause all the notes to be repeated – even very large sections. In the same manner, voices can be changed, raised or lowered by semitones, increased or decreased in value or even erased.



you wish the sound to cover. The program has been designed around the CASIO series of synthesisers, but I had no problems with my Yamaha DX7. In fact during a recent 'jam session' it handled two DX7's and a Jupiter with some fill ins from the ST's sound generators! It sounded very nice indeed.

The File screen allows you to load, store, append, rename and delete files. A useful and considerate feature also allows a new disk to be initialised too. These selections are made with the mouse, the instruction is entered before the file is selected. When the instruction has been carried out the 'DONE' button is pressed and the file appears on the main composing screen. To play your own, or any of the included pieces, there

# FOR YOUR ST

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Some of the features that I did not like were as follows: The time signature and bar measure were there for decoration only. If you are familiar with ADVANCED MUSIC SYSTEM II on the old 800 series, you will know that these functions have a meaning and are very important. Not so with the Music Studio. The speed with which a piece can be played is limited to the range of 56 to 200. I would prefer a greater range, say from 10 to 300. Similarly, I would have liked another note and rest value corresponding to a 64th. The volume and speed controls govern the whole performance. It would have been so much more enjoyable to have these control distinct passages allowing for accel/rall and crescendo/diminuendo, in other words sound COLOUR.

Another feature missing from the sound colour is the inability to play legato or leggiadro, which means smoothly, gracefully. Expression is a vital part of any melody. The ability to change key at will is yet another example of a useful feature that is missing. Many composers will introduce key changes throughout the piece to change the mood and character. Some will also have numerous tempo changes thrown in for good measure too. Take, for example, 'Memory' from Cats by Andrew Lloyd Webber. Here one finds three time signature changes in the first ten bars and no fewer than three key changes throughout the piece. To play this piece effectively with the Music Studio is impossible, one can get pretty close, but that's about it. Having the

composing screen 'live' is very annoying. After only a few minutes the volume of the monitor and/or synthesiser is quickly turned down. It would have been much better if it were live only when a note was being entered. Lastly, it is a great shame that it is only available in colour. Having the option of monochrome and its increased resolution could possibly introduce many additional features and also reach the very large number of owners who only use monochrome. The current retail price is about £35. At this price this has to be one of the best value-for-money pieces of software I have seen for a long while. On a marking out of 10 I will give it 10 for Educational Value, 9 for Entertainment Value, 6 for Ease of Use and 10 for Value for money.

## Starglider

Reviewed by Michael Stringer

There are classics and there are classics, but I cannot remember ever being stopped in my tracks by a game. Many are impressive, memorable and until now, only found on the old 8-bit Atari. The Pawn has established itself as a deserved leader in demonstrating — to those sceptics — the awesome power of the ST. That was until Rainbird launched 'The Starglider'.

The game is neatly boxed and comes with a game plan, a book which is required reading, a keyguide, a poster of the AGAV (Airborne Ground Attack Vehicle) and the program disk.

The disk auto-boots in colour and mono, so those ST owners with only mono systems will not be left out in the cold!

After about forty seconds the game starts with an intro screen and a musical accompaniment. Not just any old musical introduction, but about twenty seconds of a pop group sound sample! They are all there, about five vocalists, drums, synthesizers and guitars. It is **superb**.

Sound sampling is not restricted to the musical introduction, a very charming female voice warns you when the AGAV requires servicing and again when you have successfully docked with a silo and repairs — laser cannons, plasma drives, etc have been replenished. She may appear later in the game, but I have not met her again. Mind you, I am still a humble Rookie!

The book, mentioned earlier, has to be read to pick up the hints towards a strategical game plan. But in all honesty,

it was a few days before I did get down to reading the story.

I will keep the scenario very brief. Your planetary system is under attack from a merciless foe. He is armed with some formidable weaponry systems, but the ace up his sleeve is the Starglider.

Your planet is almost annihilated, but you discover the AGAV in a museum. Such is the protection surrounding your planet that ground weapons, aircraft and an army are considered pointless. That was mistake number one. There are four underground service silos for the AGAV still in full operation. The only reason for this is because the authorities forgot all about their existence due to robots servicing them!

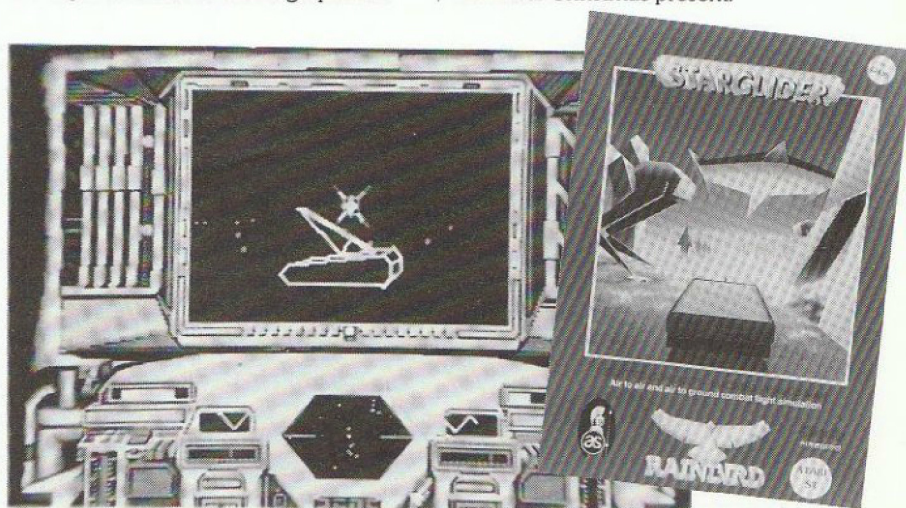
Although the colour version is very impressive, I much prefer the greater resolution of the monochrome. The concept of animated vector graphics is

used. The detail is quite stunning and the action is fast and furious.

You fly the AGAV with the mouse. I use a large board on my lap and I can settle down in my favourite comfortable armchair for a couple of hours relaxation. It took quite a few hours to develop a competent flying skill, when I could manoeuvre the craft into stall turns, climbing/descending turns and spins without having to think of the mouse actions to perform them.

The author of the program is twenty year old Londoner, Jeremy (Jez) San of Argonaut Software and I look forward to his future programs with great anticipation.

The game will retail for less than £25, which is good news. My verdict is 10 for program design, 10 for presentation, 11 for graphics and sound! An ideal Christmas present.



## TRIMbase

Reviewed by Michael Stringer

Designed and programmed by Andrew Colin and Chris Maden, and distributed by *Talent Computer Systems*. The cost is £89.95, including VAT. It is described as a 'Full Relational Database, integrated with GEM and supremely easy to use.' The technical specifications are:

Operating System — GEM  
Multi-File Operation — Yes.  
Maximum Record Size — One screen.  
Maximum field size — No limitation within maximum record.  
Maximum number of fields — as above.  
Language versions — English and German available.

Although it is not documented in the specification list the maximum number of records possible is 32,000.

I had seen an example of the program at the recent PCW Exhibition and it looked impressive, but looks can be deceptive! TRIMbase quickly sent me a copy upon request and I started to familiarise myself with it. All went well until I tried to define my own records. The program just locked up. I returned the disk to TRIMbase and they quickly returned with another. They stated that they had tried the returned disk and program on other drives, but could not reproduce any of the faults that I had described. The disk they returned to me was in fact another version, 1.45. The disk I had originally was version 1.44! This new disk, I was informed, was well and truly tested and if it failed to load, etc they would investigate further.

In all honesty, I can only appraise a product that I am given. This disk also had a fault, but it did not demonstrate any of those faults that I had experienced earlier. This fault I will come to in due course.

Let me say at the beginning that I liked the concept employed in its design. There are three integrated programs, Maintain, Define and Report.

The record file is created with the Define program, which can be called from either of the other two programs, or as a stand alone program from the desk top.

Once you are satisfied with the layout of the record, this is saved, and data is entered from the Maintain program. To produce report forms containing data obtained from the database, the Report program is used.

### Define

Five different types of field are

supported in this program. The first is NUMBERS, integers, currency and decimals. The second is a DATE field, the third is under the heading of CLASS VARIABLES. Class Variables are short, regularly used variables with a few possible values, such as: Mr/Mrs/Ms/Dr/Male/Female/Hot/Cold, etc. The remaining types are TEXT and BLOCK.

The field heading is decided, such as 'Name:' and when Return is pressed, a small menu appears. The field heading would require the choice of TEXT, selecting this with the mouse and hitting Return, a request for the length of text in characters. In this instance, 20 would probably suffice.

In a similar manner another field called 'Address:' may be created. With a field such as an address, there are two options. One is to use TEXT or another choice is BLOCK. Once again the size of the field is decided.

Perhaps another field would be 'Telephone Number:'. The field type in this instance should only include numerals, so the logical choice of field type would be NUMBER and a suitable length of 12. After entering all the field data, you may decide to include another field called 'Title:'. This field could fall under TEXT or CLASS VARIABLE. If the latter is chosen, then the data for the Title field can be defined. For example, Mr., Mrs., Miss and so on. The program would only let you enter data in the manner in which you defined it. MR would not be accepted, neither would Mrs, the first is in block capitals and a missing full stop, the latter also has a missing full stop.

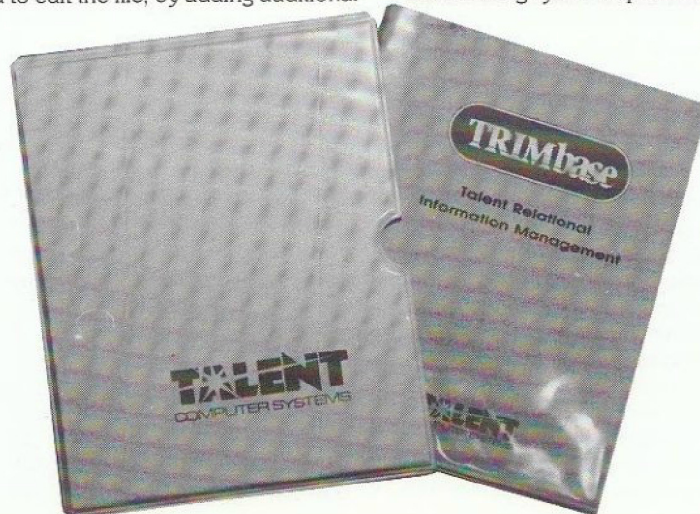
Once you are satisfied with its appearance and size, it can be saved. If, at any time in the future you have a need to edit the file, by adding additional

fields such as 'Postcode:' or 'Birthday:', it is very easy to make such changes. There is a special facility for this very purpose in one of the menus of the Define program.

Data for the database can be entered from two sources, the keyboard or imported from compatible files constructed by other programs. I have not tried this latter feature, therefore I will decline from making any comments.

It is very easy to sort the file into any order that you may require, but when you have finished with the file and written it back to the disk, EXTREME CAUTION must be observed. The manual devotes quite a great deal of space to this procedure. The reason for such caution is due to the fact that files are HELD IN RAM!! Do you remember the database that USED to be given away with the ST which I reviewed in an earlier edition of 'MONITOR'. This uses a similar method of file handling and, surprise, surprise, up pop the same old problems. Some people will never learn!!

When a complete file is held in RAM it is asking for problems and unfortunately, little nasties such as glitches and badly written routines DO appear at frequent intervals and can cause havoc. I like the little warning prompts that appear when you try loading a file that is corrupted!! My warning prompts are not very amusing, downright disgusting in fact. What to do now? The answer to that question is very simple. 'Load up the backup file', I hear you chorus. Correct, I was just checking! So you swap disks, re-load and what happens? The file that you backed up is also corrupted, because unknowingly, you had duplicated a corrupt file. A secure filing system is paramount.



If you have a printer, or access to one, a very creditable feature of this program is the Report Generator. If you need to prepare address labels, mail mergers and the like, this section is ideal. It is very simple to use, with adequate help from the menus and their contents. I could only persuade one of the Reports to work. Trying to display the other file, I was greeted with the familiar bombs and dumped unceremoniously onto the Desk Top.

I could expound to a number of boring pages all the faults and dislikes of this program, starting from the opening request to input the date.

In the files that you create, where a Date field is used, you enter the date as a numerical string into a box that is outlined in this manner `../././.`, logical and convenient. But the designers ask you to enter the day, press the down arrow, enter the month, press the down arrow, enter the year and a final press of the return key. Why couldn't they have used the same method as you? It would then be very simple to use one of the many Boolean algorithms to affect the same result.

Or, I could expound on the lack of printing facilities, cancelling File loading requests, unsorted Help screens, badly written GEM requests such as scrolling, gliding, paging, drop-down menus and so on. The concepts behind the program are superb. It is the actual end product that is so lacking. If only greater care had been used in the GEM routines, a better use of GEM Resource capabilities and the use of a disk filing system, this would be an excellent product. I often wonder when I see comments regarding this program such as 'Talent has taken the full potential of the vast processing the ST possesses.. an excellent product', or '..the relational operations are particularly useful for efficient database management and the report generator is very useful indeed' can it possibly be the same product that has been reviewed? Apart from the potential of the Report Generator, I could find not one impressive feature, that works reliably. It gives me little solace to read at the

beginning of the manual 'WARNING, TRIMbase has been carefully and thoroughly tested by many people before being offered for sale, and we believe it to be free from major errors. However, unbreakable computers, uninterruptable power supplies and perfect programs just don't exist. If your database contains vital information, you must protect yourself by keeping backup files so that if anything goes wrong your data can be recovered'.

This program went on sale to the general public in the late spring. After receiving two different versions in the space of a week, in the Autumn, I wonder if *any* in-house testing took place (so-called 'Alpha Testing') or if any out-house (or Beta Testing) took place before it was released for sale and Mr 'Joe Public' does all the testing for them?

It is all very well to try and cover bad practice with statements such as 'perfect programs do not exist', but I maintain that they **SHOULD** be perfect, **BEFORE** they are sold. The law demands that the article be of merchantable quality, so there exists an ethical and a legal obligation which must be met by the manufacturer! For almost £90, this program's closest competitor is dbMAN, a dBASE III clone which retails for £99. Quite honestly, there is no

comparison!

Record handling by TRIMbase is in RAM, dbMAN is disk.

A record is limited to one page with TRIMbase, a record can be up to 4000 characters with dbMAN.

Record length is limited to 32000 with TRIMbase and dbMAN has no such restrictions.

TRIMbase can only perform very limited mathematical functions, typically the addition of all numerical fields and a crude statistical analysis. dbMAN is capable of implementing quite impressive mathematical routines and formulae.

TRIMbase is GEM based, but not to the standard set by many other programs. dbMAN is not GEM based, although a GEM version is shortly to be released.

TRIMbase uses its own limited functions, whereas dbMAN is based upon the industrial standard, dBASE III. This is a probable reason why Atari have taken such an interest in the product. Apparently they are using dbMAN extensively throughout the organisation. I am impressed with the specifications of the clone and I look forward to reviewing it for you in the near future. Regular readers of this section will know I am always on the look-out for a good Database. Well, I am still looking!

## Easy Record

from Microdeal at £39.95

### Atari ST Mono/Colour

Reviewed by Matthew Tydeman

Easy Record, a management system for C programmers, is one of Microdeal's most recent releases for the Atari ST and helps those programming in C to access and maintain data records in one simple operation. Although Easy Record is not a database system, it is a storage system for handling information stored in systems such as databases.

The File Management System and the File Set-up Program form the main content of the package. The File Management System is a set of C functions which contain the necessary code to create and access index and record files, while the File Set-up Program is a GEM menu driven utility where you, the programmer, can specify the values and the attributes of index and record files. Output is in the form of C source code and/or small efile descriptor blocks (the record and its index file) which are split into two parts. One part of the efile contains the index(es) and the other

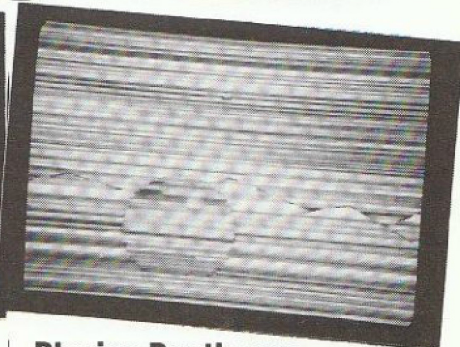
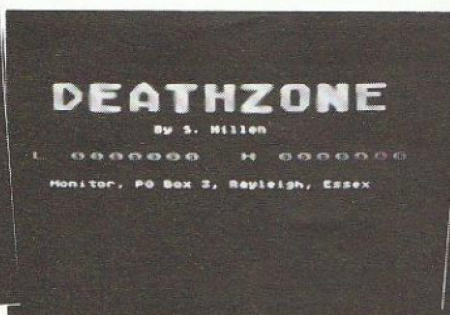
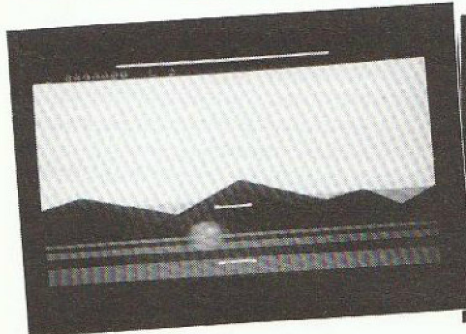
contains the records (together with linked lists for key fields allowing duplicates). Therefore there is only one index file per record file.

Easy Record is ready to run after a few simple setup steps. Definition of your applications record storage requirements is the first thing, efile attributes must then be set using the File Setup Program. From here on, you are able to access the efile descriptions from your application and create 'active' efiles. Maintenance of your records is then possible by use of the File Management System. Easy Record allows management of records for up to 16 indexed record files at any one time. Eight key fields (with 123 bytes per key field) per indexed record file with eight subfields per key field.

Easy Record is a product written by professionals, for professionals and should help all C programmers whose data records seem to take forever to organise and keep in an orderly fashion. For £39.95 Easy Record should make someones day. C source code is included.



# DEATHZONE



Suddenly, your scanner detects the presence of an alien. Moments later it screams into view, charging headlong at you. In desperation, you back off, firing salvos of raw energy bolts at your attacker. One strikes home and the alien pod disintegrates into scintillating dust. You were lucky that time, but how much longer will you be able to survive in the *Deathzone*?

*Deathzone* is a fast moving 3 dimensional arcade game that will work on all 8-bit Atari micros. Although it will run in 16K, you will need at least 32K to type it in. If you own a 16K machine, you will need to ask a friend with a larger system to help you type in Listing 1 and RUN it. Once the boot tape or disk has been created, you can then load and play *Deathzone* on your 16K computer.

## Typing it in

Listing 1 is the Atari BASIC program that will create an autoboot version of *Deathzone* on disk or cassette. Obviously, the data is written in hexadecimal in order to make the program as small as possible.

Please note that this listing will *not* fit in a 16K system.

The assembly language source code is provided on Monitor disk 14 for those of you who are interested in seeing how the game works. You *do not* have to load this in to play the game!

## Cassette Instructions

Type Listing 1 into your computer using BASIC. Remember that you will need at least 32K. If you are not using KEYO then just ignore the two checksum letters before the line numbers. When you have finished typing it in, save it off (this is just in case you lose all your typing when you RUN the program), and then RUN it.

You will be asked if you require a cassette or disk version. You should type 0 and press [RETURN]. The program will start checking the data, and will

## by Steve Hillen Disk/Cassette Runs in 16K

notify you of any errors. When all the data is correct, the computer will prompt you to insert a blank cassette into your recorder, press [PLAY] and [RECORD] and then press [RETURN]. The program will now save off an autoboot cassette version of *Deathzone*.

It's also a good idea to CSAVE the BASIC code before turning off the computer, in case the autoboot copy does not function, then you can reload all your typing and start again!

To play *Deathzone*, turn off your computer, remove all cartridges and, pressing the [START] key, turn on the computer. (If you own an XL or XE then press [OPTION] as well). Press [PLAY] on the recorder, and then [RETURN]. *Deathzone* will load and run automatically.

## Disk Instructions

Type Listing 1 into your computer, remembering that you need at least 32K. If you are not using KEYO then just ignore the two checksum characters before each line number. When you've finished, RUN the program. Type 1 and press [RETURN] to tell the program to make a disk version of *Deathzone*.

The program will check the data statements, notifying you of any errors. Once all errors have been corrected, the program will ask you to insert a disk with DOS and press [RETURN]. Use either DOS 2.0 or DOS 2.5. The program will now create an AUTORUN.SYS file on that disk. Do *not* change the filename! Save the BASIC program out before continuing just in case you need to go back to it.

To play *Deathzone*, insert the disk containing the AUTORUN.SYS file into your drive, remove all cartridges and boot the system. *Deathzone* will load and run automatically.

## Playing Deathzone

If you have followed the instructions correctly, you will now be looking at the title page for *Deathzone*. Both the last (L) and highest (H) scores are shown. You can start the game either by pressing the trigger of joystick 1 or by pressing the [START] key. If you should wish to abort a game before completion, either the [SELECT] or [OPTION] keys will bring you back to the title page.

When you start the game, you will notice that the screen is divided into sections. At the very top is a horizontal line whose length indicates how close the alien is. Two sets of directional arrows at either end of the line indicate whether the alien is to your front, left, right or rear.

The next line is the status line showing from left to right your score, lives remaining, and the current level of play. Further down, there is a standard radar scanner superimposed on the sky. The white central dot represents your own position, of course.

By using the joystick, you can move in and out of the screen, or swivel on the spot. You must do your best to avoid both the aliens themselves and the energy bolts that they fire. Each time you are hit, you will lose a life. You will need to dodge, reverse away and fire rapidly in order to destroy the aliens before they reach you. Incidentally, you can pause the game with the space-bar, and continue it by moving the joystick.

Every so often, an alien pod with rather different characteristics will attack you. If you should succeed in destroying it, then you will receive an extra life and move up to the next level of play. If not, then you will have to restart that level. There are a total of 6 levels, each progressively more difficult than the last. Should you complete the last level, well... wait and see!

Lastly, a word of thanks to my brother for writing a 'black-box' 16-bit maths package around which the game was based.



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XS 1470 DATA 203328A5940595D0034C1928A596  
0597D0034C2220A2008690069186928693A596  
38E594859BA597E595B008E8,104  
VY 1480 DATA 069626974C6227059B00034C0E28  
E000F02346976696A59438E59648A595E59748  
800468689007688595688594,31  
SW 1490 DATA 38268E268FCAD0DDA21046976696  
66936692A59438E596859B48A595E597489042  
059B001CA59038E59248A591,829  
UP 1500 DATA E59348902F688591680590688595  
68859438B02568859688594A59038E5928590  
A591E5938591B008A594D002,730  
CK 1510 DATA C695C69438B005688686818268C  
268DCA09D206D2860E838268E268FCAD0F9F0  
F1A5960597D002E68E60A280,529  
UD 1520 DATA A000A59545973002CA88868F848E  
60A5954597859AA5951009A694205E28869485  
95A5971009A696205E288696,569  
UJ 1530 DATA 8597A900858C858D858E858F6085  
998698A90038E598AA900E59960A58C100AE6  
8DD006E68ED002E68FA59A10,417  
HJ 1540 DATA 10A00038A900F98C00998C00C8C0  
04D0F360A59438E9008594A595E9408595A900  
859AA5951009A694205E2886,628  
QJ 1550 DATA 948595A59529C0F011A90038E594  
8594A980E5958595A9FF859A06942695269426  
95B02826949004E695F020A6,494  
EC 1560 DATA 95BD4929186901858EA900690085  
8FA59A100BA58FA68E205E28868E858F60A900  
858E858F60A900859AA59A694A5,428  
LX 1570 DATA 951005859A205E288D492A48BD49  
28AA68A49A1003205E28858F868E60A68FE8E0  
02B00FCA8A458E3009A58E85,163  
FF 1580 DATA 8FA58D858E60A27FA0FFA58F3005  
868F848E60E8C8F0F7FFFFFFFFFFF,209  
LC 1590 DATA FDFCF0CF0CFBFBFAFAFAFAF9F9  
F9FBF8FBF7F7F7F6F6F5F5F4F4F3F3F2F2F1  
F1F0FEFEFEFEFEDECECEBEA,232  
BL 1600 DATA EAE9E8E8E7E6E6E5E4E4E3E2E1  
E0DFD0FDDDDCDBDDBDAD9D8D7D6D6D5D4D3D2D1  
D0CFCECECCCBAC9C8C7C6,2  
KL 1610 DATA C5C4C3C2C1C0BFBEBDBCB8B9B8B7  
B6B5B4B3B2B1B0AEADACABAA9A7A6A5A4A3A1  
A0B9F9C9B9A999796959492,773  
TD 1620 DATA 91908F8D8C8B8988878584838180  
7F7D7C7A797877747271F6F6E6C6B6A686765  
64626160E5D585A58575554,956  
AD 1630 DATA 52514F4E4C4B49484645442403F  
3D3C3A3937363432312F2E2C2B292826252321  
201E1D1B1A1817151312100F,151  
DW 1640 DATA 0D0C0A0807050402010000000000  
0000010101010102020202020303030303  
030304040404040405050505,296  
RY 1650 DATA 850506060606060607070707  
07080808080808080909090909090A0A0A0A  
0A0A0B0B0B0B0B0B0B0B0C0C0C,682  
XR 1660 DATA 0C0C0C0C0D0D0D0D0D0D0E0E0E  
0E0E0E0E0F0F0F0F0F0F0F10101010101010  
1111111111111112121212,359  
KU 1670 DATA 12121213131313131313141414  
1414141414151515151515151616161616  
1616161617171717171717,295

UB 1680 DATA 17181818181818181819191919  
19191919191A1A1A1A1A1A1A1A1A1B1B1B1B  
1B1B1B1B1B1B1C1C1C1C1C1C,456  
IG 1690 DATA 1C1C1C1C1C1D1D1D1D1D1D1D  
1D1D1D1E1E1E1E1E1E1E1E1E1F1F1F1F1F  
1F1F1F1F1F1F1F0029517AA3,53  
IY 1700 DATA CCF41D466F97C0E9113A628BB4DC  
052D567EA7CFF720487099C1E911396189B1D9  
01295178A0C8EF173E668D85,730  
JE 1710 DATA DC032A51789FC6ED143B6188AED5  
FB22486E94BAE0062C51779DC2E70D32577CA1  
C6EB1034597DA2C6AE0F3356,242  
IW 1720 DATA 7A9EC2E5092C507396B9DCFF2144  
6789ABCE0F12345677998BDCFD1F406182A3C3  
E40525456686A6C6E6052544,8  
NC 1730 DATA 6483A2C1E0FF1E3D5B7A98B7D5F3  
112F4C6A88A5C2E0FD1A3754708DAAC6E2FE1B  
37536E8AA6C1DDF8132E4964,131  
EC 1740 DATA 7F9AB4CFE9041E38526C869FB9D3  
EC051F38516A839CB4CDE5FE162E465E768EA6  
BED5ED041B334A61788EA5BC,837  
YA 1750 DATA D3E9FF162C42586E849AB0C5D8F0  
061B30455A6F8499AEC3D7ECA90185E2AD00D3  
C9FFD004A900F0362908D003,744  
SG 1760 DATA 20B22CAD00D32904D00320922CAD  
00D32902D00820122DC6E220AB2DAD00D32901  
D00820062DE6E220AB2DA950,948  
SN 1770 DATA 8D02D2A9228D03D260A82E003D0  
0CA2FFAC3323D002A050888AFA0E88682E6C8E6  
C8A900A2804C22CA82D00E,993  
KN 1780 DATA A204AC3323C04F002A0FFC8B4F0  
CA8682C6C8C6C8A900A280205E2885A324BA10  
188A18659E859EA59F65A385,763  
SU 1790 DATA 9F8A1865DE85DEA5DF65A385DF60  
8D3328D39238D3F2349808D36238D3C238D42  
2360A90120D32D20922DA900,420  
WL 1800 DATA F00AA9FF20D32D20922DA98085A0  
24BA10E3A5D0C859A45D8595209D2820C2DA5  
8FA68E24A03003205E2885A3,813  
FT 1810 DATA 8A1865DA85DA8A365D885DBA5DC  
859A45D8595209D2820C2DA5A8596A5D885  
97A58E8594A58F8595204327,110  
KM 1820 DATA 20222A58E859A458F859520FE28  
A68EA58F24A01003205E2885A38A1865D0C85DC  
A5DD65A385DD60A9008586A9,603  
VP 1830 DATA 0185B7A59C85DA59D85DBA59E85  
DCA59F85DD60A5DC859EA5DD859FA5DA859CA5  
DB859D60A58E859A458F8595,690  
IZ 1840 DATA A5868596A5878597201827202229  
608583C5C6F00C85C6A5C5495585C5A9008583  
A584186583300EC9149012A5,938  
MM 1850 DATA C5495585C5A900F008A5C5495585  
C5A9138584AA5C59DC22A2495A88A4AA989D  
C0228A4AA989DB422A200A5,743  
GZ 1860 DATA 84C9039005E903E8D0F7A5C59DB9  
22A200A584C9059005E905E8D0F7A5C59DB922  
60C68D010A902858BA58A10,776  
PK 1870 DATA 19AD10D0F00420AD2E60A90F858A  
A90385CBA97085C8A910858920AD2EA58AAA4A  
18A90F85C9E00ED00BA90185,921  
PZ 1880 DATA CBA5C818690885C8E00C00BA900  
85CBA5C818690485C8A9028D06D2A48F00288  
8884890C07D2A9148581A900,339

FR 1890 DATA 858020BA2EC68A60A900A09F9900  
14C8C0D090F860A9018586E00C9017F0138A38  
E90DAABCFB2EBDFE2E8586D,184  
SA 1900 DATA 012FAAD00AA20F8A4A49FF1869B8  
A886A4BD1E32AAA5868588BD96319180C8C688  
D0F9E8C6A410ED60ACAB9F02,219  
HD 1910 DATA 02040B0F08A59D3021C960900CA5  
9F4980859FA95F859D859CA59DC902900BA5E1  
3010C902900C4C8C2FA90285,886  
CB 1920 DATA 9C859D208C2FA90085E520993485  
898D07D2200335A9FF858A20AD2E202426A226  
A51485A3A004AD0AD29916D0,756  
EC 1930 DATA C004D001888810F2AD0AD28D12D0  
AD0AD28D19D08D14D08D15D0AD0AD28D13D009  
108D01D2A514C5A3F0CDA10,303  
MD 1940 DATA C6200D27C64D00568684CE223CE  
E21B20242620A72FA5EED00320DA3720A33660  
A900AA9D00139D00159D0016,684  
FK 1950 DATA 9D0017E8E0DF09EF6020A72FA69D  
E002900DA59C1001E8E0409005A90085D960BD  
463185D9AAE010B02EA5A538,272  
DT 1960 DATA F086318D02D0A9008D0AD086A48A  
4A85A3A9B738E5A338E5D0A8BD1E32AABD9631  
990016C8E8C6A410F460E016,252  
YB 1970 DATA B0638A38E910AA86A8A5A38FD2E  
328D02D01869088D03D0A9008D0AD08D0B0BD  
3A3238E5D0A8BD343285A6BD,642  
PY 1980 DATA D132AABD4032F01C99001786A3A2  
0086A7A6A4A26A7CA10FAA6A3A5A7990016C8  
E8D0FA6A8A5A538FDC2334B,646  
TH 1990 DATA BCBC33BDCB33AA684C1A318A38E9  
16A86A88BD7328D0B0BDDF328D0CDB0BDB32  
8D0AD0A5A538FDE7328D07D0,589  
RX 2000 DATA 187DE3328D06D07DE3328D05D07D  
E3328D04D07DEB328D02D07DEF328D03D0BAC  
33BDF33238E5D0A8B9F732F0,686  
EY 2010 DATA 1F85A4B9F8329D0013B9F9329D00  
16B9FA329D0017E0C6A4D0E9C8C8C8D0C8B  
888888B9F732F01F85A4B9F8,291  
FZ 2020 DATA 329D0013B9F9329D0016B9FA329D  
0017E0E0DFF006C6A4D0E5F0D8A6A8B8C033A5  
A5187DB43348BD8833AA688D,395  
TZ 2030 DATA 01D0ADC2021869028D13D08DC102  
86A49838E5D0A8A9008D09D0BD1E32AABD9631  
990015C8E8C6A410F4600000,597  
XG 2040 DATA 19181716151413121110F0E0D0C  
0B0A0A0909080807070606060605050505  
0404040404030303030202,30  
RB 2050 DATA 02020202010101010100000000  
0000005050404050504040505040405050404  
08080818181818181808081C,344  
VM 2060 DATA 1C1C08081C1C1C0818183C3C3C  
181818183C3C3C1818081C1C3E3E3E1C1C08  
081C1C3E3E3E3E1C1C08183C,922  
RO 2070 DATA 3C7E7E7E7E7E3C3C18183C3C7E7E  
7E7E7E7E3C3C181C3E3E7F7F7F7F7F7F7F3E3E  
1C1C3E3E7F7F7F7F7F7F7F7F,161  
VA 2080 DATA 3E3E1C183C7E7E7E7E7E7E7E7E7E  
7E7E3C18183C7E7E7E7E7E7E7E7E7E7E7E7E3C  
18000103060A0F151C242D37,444  
QG 2090 DATA 424E586978090808080808060706  
070707AFAEADABAA7C0E0E0F0F0F0F0F8F8F8F  
8F8F0F0F0E0E0C000C0E0E0F0,864



# HAPPY REVISION 7.0

Reviewed by Rick Holtzhauer.  
Reprinted from Current Notes.

Not too long ago, I received a strange envelope in the post. On the outside was stamped 'Rev 7'. Then it hit me. Could it be? It was indeed! The long awaited Happy Rev 7, something I thought would never be released, was finally in my hot little hands.

For most Atari users, the word 'Happy' is synonymous with the word 'backup'. In fact, the Happy Backup program tends to overshadow other aspects of the Happy package. For those of you not familiar with a Happy drive, the Happy is a drive enhancement for the 810 and 1050 drives. It is a custom chip board that replaces the Atari EPROM and 6507 CPU. The board plugs in where the 6507 was removed. On board is the Happy ROM, a 6502 CPU and, depending on the board, either 6K or 8K of RAM.

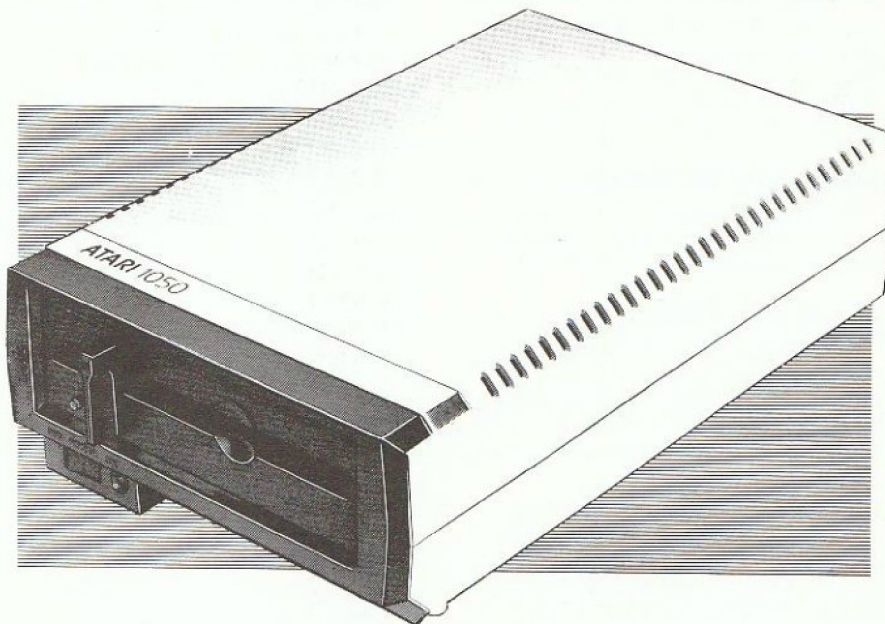
Such a board set-up enables very fast reads of a disk, enables true double density (1050 only), a permanent record of which density the disk is in (so the density doesn't have to be read each time the disk is accessed), disk formatting capabilities not available to a standard drive, and other neat things.

Somebody booting up a Happy drive for the first time will be amazed at how quickly it reads. The drive will read the entire track in 1.05 revolutions of the disk. This track is read into the onboard RAM buffer, then transferred in machine-gun-like speed to your computer. This type of disk read is termed 'track buffering'. Theoretically speaking, if the drive had enough RAM onboard, it could read the entire disk in 42 disk revolutions. The drive would never have to be accessed again for a read operation. The Happy would just read from the RAM instead of the disk.

A couple of exceptions to the fast read time. One is with a disk formatted by the Indus GT drive while in Synchronesh mode. Both the Happy and the 1050 Duplicator have a very tough time trying to read this disk. The Indus places a non-standard sector arrangement on the track, and for reasons I don't know, makes life tougher for these enhancements. The other exception is with a commercial disk protected using a double sectoring technique. These enhancements cannot correctly read through the double sector.

A Happy drive will recognise a read or write to sectors \$8000 - 97FF. This is the RAM buffer on the Happy board.

Happy uses part of it in conjunction with the drive ROM for various purposes. The Omnimon manual states that \$800-up is the addressing for the RAM. I guess it just depends on the board you have.



## Program Operation

The overall operation of the various programs is excellent. Every error except one I have encountered has been trapped. Since the backup and compactor, among others, load some of their programs into the drive buffer, turning your disk drive off and on during operation of the above will result in an error, since this buffer will be cleared on power up. The programming itself is very professional. It is obvious someone invested quite a bit of time on working out all possible bugs.

## Warp Speed Menu

Upon booting up, the user will be presented with the Happy Rev 7.0 Warp Speed Menu. Also displayed is the number(s) of Happy drives in the system, either a 130XE or an Axion RAMdisk, the amount of memory available to the user, and whether any tracer information (explained later) is available. Below is the Warp Speed Menu:

1. DRIVE OPTIONS
2. DIAGNOSTIC
3. SECTOR COPIER
4. HAPPY BACKUP PROGRAM
5. HAPPY COMPACTOR PROGRAM
6. MULTI DRIVE PROGRAM
7. ENABLE TRACER
8. DISPLAY TRACER INFORMATION

I'll go over each of the above in order, with the exception of the backup program. This deserves a detailed description.

## 1. Drive Options

This option displays a sub-menu, each function deserving individual comment:

SET UNHAPPY MODE  
INIT DRIVE  
CHANGE DRIVE NUMBER  
SET TO NEW OFF DELAY  
SET TO U.S. EMU  
SET WRITE PROTECT, ENABLE  
SET TO FAST WRITE

## Set Unhappy Mode:

By placing the Happy drive in the unhappy mode, your drive will resemble a stock drive, with the exception of allowing double density. I thought that a Happy drive placed in this mode was undetectable, however, Happy Computers informed me there was a program on the market that would not operate properly in the unhappy mode with previous versions of its software.

The program is 'Alternate Reality'. A custom SIO routine is used to read the disk and, for reasons beyond me, would not operate correctly on 'unhappy' Happy drives. Happy Computers stated they didn't know if this was a deliberate attempt to seek out the Happy, or was just coincidental. In any case, this has been taken care of in Rev 7.0.

This is also a good time to point out how programmable this drive really is. The Happy drive only recognises a few commands on boot up. The standard read, write, etc..., and a few special ones the drive uses. These are transferred to the RAM buffer on board. This procedure gives Happy enormous flexibility, as it allows each program from the menu to load only the commands it needs at the time, and allows these commands to be changed easily if needed.

## Init Drive:

By selecting this option, the drive assumes the state of just being turned on.

## Change Drive Number:

Allows the user the option of changing the Happy drive from, say, drive one to drive three, without having to mess with the switches on the rear of the drive. Boy, can this come in handy!

## Set to New Off Delay:

Changes the time, from a scale of A-Z, the drive takes to timeout after the last disk operation.

## Set to U.S. EMU:

I frankly don't understand this option. I believe it has to do with allowing Sparta-DOS to operate on the Happy at high speed. It also says something about improving some of the I/O aspects of some Happy's. I just don't know. I'm reading from the manual here, but it still doesn't mean much to me. I also don't have Sparta-DOS. Sparta-DOS users will probably be able to understand this much better than I.

## Set Write Protect, Enable:

These options are available only if the user has the 1050 Controller switch. This will either write protect, without a write protect tab, or write to either side of a disk, notched or not.

## Set to Fast Write:

I think I had my Happy 4 months before I realised the significance of this option. It is not explained in the Rev 6.6 instructions to any great degree, but it is in the 7.0 manual. Anyway, this allows for fast writes on a Happy drive. Normal write speed is improved, and it is actually a fast write with verify! Happy users may try this by choosing this option, then booting up a DOS and copying a file. The difference is very noticeable. I liked this so much I made a small DOS file that enables this option and placed it on many of my DOS disks. The option stays enabled until the drive is turned off.

A word of caution. The drive may appear to have finished the write operation, but is not actually completed until the red light on the drive goes off. If the door is opened before the light is off, the light will begin blinking, which means a write verify error has occurred. So many people remove the disk from the drive before the light goes off, that Happy had to make the default condition of this option 'off'.

## 2. Diagnostic

The Happy Diagnostic checks for correct operation of drive RPM, controller switch, high speed I/O, reads and writes in all three densities, and a test of the Happy itself. Altogether, a pretty comprehensive package.

## 3. Sector Copier

If you have never seen a Happy in

operation before, and have the opportunity to see just one feature, this is it. The read and write speed is incredible, and the first time I saw it going, I thought my drive was broken. The program does not use the SIO access location at \$E459; instead, Happy designed a custom program embedded inside the Sector Copier. Normal SIO baud rate is around 19,200. The Sector Copier operates at over 40,000. Happy says the time could be improved even more, but I think they mentioned something about compatibility with the 810, which allows the two to work together, as the reason for its current limitations. Indus drive owners will notice the resemblance to Synchronesh. However, this SIO routine will knock the socks off the Indus in write operations. No special format is needed either, as the Indus requires.

The program operates in all three densities, and you can pick the density you want or let Happy automatically choose it for you. This program also supports RAMdisk operation, so a single density disk can be copied in one swop. If a bad sector of any type is encountered, operation is ceased, and an error message is printed.

## 4. Happy Backup Program

See comments further on in this article.

## 5. Compactor Program

This program alone is darn near worth the price of the package. The Compactor is used to combine self-booting programs that do not use the entire disk onto a single disk, and all protection is duplicated. Compacted disks may only be used on a Happy drive.

For example, say I have three programs, each twelve tracks in length. I wish to combine the three onto a single disk. Using the Happy Tracer, I would first trace out a disk, then load the Compactor. The Compactor checks a directory to make sure enough room is available, then copies the tracks previously traced from the original disk to the compacted disk. It then asks for a filename, which may be up to 16 characters in length.

To load and run a compacted disk, insert the disk into the Happy drive. A menu will be presented. Push the appropriate number, and away you go. The Happy then loads in necessary data to the drive buffer and places the drive in the unhappy mode. You cannot write to the disk, nor will the Happy be recognised, until the program is loaded and you open the drive door. When the door opens, writing is enabled and your Happy goes out of the unhappy mode to normal Happy operation. Backup capabilities of the Compactor are

equivalent to the Happy Backup Rev 6.6.

I have used this program extensively to back up programs. But by using this when I can instead of the Backup, I have cut the number of disks I have needed by about 60%.

## 6. Multi Drive

The Multi Drive is for a two-four Happy drive system configuration. As I have but one Happy drive, I can only pass on what is said in the manual. This option allows up to three copies of a source disk to be written in slightly longer than it takes to make one copy. The drives actually read and write at the same time. This sounds pretty impressive. It copies some forms of protection, but not skew alignment or PDB files (explained in Happy Backup section). This would increase the time to copy the disk(s). This is best used to backup or make many copies of a DOS file or just a data disk.

## 7/8. Enable/Display Tracer

The tracer is a special function used mainly by the Compactor, and to a small degree, by the Backup program. By enabling the tracer, you have locked the enhancement out from the computer. Your drive resembles a stock drive. The computer is now rebooted with the disk you would like to trace. Unknown to the computer, the Happy is watching the serial bus, and remembering the number of each individual track accessed by the drive. After all data on the disk has been accessed, reboot the Warp Speed Menu, select option eight, Display Tracer Info, and a map of all tracks accessed for the disk you traced is displayed. This is quite a snazzy little operation to watch!

## Happy Backup Option

This option allows the user to make archival copies of protected software. After loading this selection, the user is given the options of either copying the entire disk, or going to a 'Special Recovery Menu'. This menu will allow the user to just copy the tracks he chooses, increase or decrease the number of times a track can be re-read if not read correctly at first (good for trying to read a garbled track), and other parameter setting. There are also two important choices here. The first is the skew alignment selection. This will increase the copy time quite a bit, but this selection is needed on a few programs that are heavily skewed. The other, and the one surely appreciated by all Happy users, is the Forced Slow Mode selection. By choosing this option, the Happy drive will place a special format on the disk. This format automatically places the drive in a slow read mode. As most commercial programs may not be read in the fast

read mode, this saves the user quite a bit of time from booting up the Happy software and turning the enhancement off. The program will also recognise a two Happy drive set-up, with the source drive always one and the destination drive the other Happy.

The copy process then begins. The process is very fast. I think this is the same SIO routine used in the sector copier, or very similar. It is slower though, because a lot of extra disk commands are needed to analyse the track and sectors. Displayed on the screen will be the track the program is on and the number of good sectors in that track. If a track is encountered that contains 20 or more sectors, the process aborts and an error message is displayed on the screen. This is also where the Rev 7.0 takes over.

## PDB Files

When I first booted up Rev 7 software, visions of disk wizardry and magic were dancing through my head. I was surprised by what I received. Any program with a protection format using 20 sectors or more per track (and virtually every new piece does), requires the use of a 'Pre-Determined Backup' file, a.k.a. a 'PDB' file. There are 24 PDB files on the disk. Some pertain to individual programs, others can be used for all disks by a company. An example would be PDB file number 3. This file is used to backup Electronic Arts programs. The protection scheme has already been figured out, and all the user does is hit start. All necessary data will be written to the disk.

## 20 Sector Tracks:

For a track with 20 sectors on it, the backup program will write out these 20 sectors without slowing down the drive. Happy Computers claim they originally came out with the 'autospeed mod' for Rev 5.2. This mod would slow down the drive to about 270 rpm, allowing 20 and 21 sector writes. The only other way I know to write 20 sectors is by eliminating some of the ID-type bytes for each sector. These bytes are unseen to the computer, and contain such information as the track number, sector number, CRC, and more. Not all these bytes are needed however. By eliminating some of these bytes, more room is available for writing sectors, enough to lay the 20th sector. These disks may be run on any drive.

## 21 Sector Tracks:

When backing up a 21 or more sector track, the disk reads the protected track, then writes it out in a special way. When this disk is loaded and run, Happy reads certain data off this disk and loads it into its onboard RAM. It then locks out the enhancement, and away you go.

The disk will behave as an original one, and the data in the RAM buffer takes care of the protection scheme. The backup created by the Happy is *not* an exact duplicate of the original, only an executable copy, and can be run only on a Happy drive.

Theoretically, this type of backup system will give the user the ability to backup any disk to appear on the Atari market for a long time to come, and maybe forever. And the operation of the program is flawless. I have yet to have a disk not run in this mode. But what happens if the disk you need to backup cannot be backed up by the Backup program, and there is no PDB file for this? You're outta luck. At the time of this writing, I have come across two such programs. They are 'Spy vs Spy II', by First Star, and 'Hardball', by Accolade. Hardball may be backed up using file number 19. There is nothing for 'Spy'. This brings us to the question of how often PDB files will be released. As needed? For the type of backup system this is, you have to expect that Happy would issue these files as needed, and quickly. But one usually does not associate the word 'Happy' with anything that happens quickly. I guess we'll have to wait and see.

I asked Happy why it could not make a duplicate copy of all programs on the market today. Especially some programs by Synapse, Electronic Arts, and Paradise. The first two use disks protected by a 34 sector track. 'Alternate Reality' employs a superb protection scheme. This track contains at least 30 sectors, but both the Happy and Duplicator read these as about 18 sector tracks, and this value varies. This track drives both the Happy and the Duplicator right up the wall, which is the reason I have not received an accurate sector count. I believe this is what Duplicating Technologies (DTI) is referring to when they mention 'weak sector' protection. In addition, a backup copy of 'Alternate Reality' made without a PDB file will give you the impression of a properly functioning program when run on a non-Happy drive, although it will not actually operate correctly.

Happy's response was that these tracks are written with a special drive controller and other hardware that could run to over a thousand dollars. I guess anything that Happy says relating to either the performance of their product or a competitor's product must be taken with a pinch of salt. I have not been able to substantiate their claim from an impartial source, either. This may be a true statement, though. The three companies mentioned do market programs that represent such a tremendous leap (21 to 34 sectors) in formatting power it may be quite true that some very special hardware or the

supernatural was employed.

The Happy can back up any type of skew aligned disk. A skew aligned disk has the tracks of a disk laid down in a precise way, and each track is relative to the track before or after it. I have a small program that checks for a skew disk, and this process is timed. If the disk is skewed, the time it takes to read these sectors is much quicker than a normally formatted disk.

The Happy backup has a skew alignment routine built into its onboard Operating System chip, enabling a backup, no matter how heavy the skew is.

Overall the Happy Rev 7 backup is a success. I don't care how the backup is created, but I guess the bottom line is I have my backup. Such a backup program may go a long way toward stamping out piracy on the Atari. It must be pretty hard for a programmer to offer a quality program at a fair price, only to see drives such as Happy be able to make copies. By at least restricting these illegal copies to a Happy drive only, you have in effect vastly reduced the market for these copies, while still allowing a backup copy to be made. I see more software companies resorting to these exotic disk formats, if that is what it takes.

## Other Programs

Also in the package are a few other files. One of these makes your Atari DOS 2.0 into a Warp Speed 2.0. This DOS will now operate at the speed of the Sector Copier. It may also be used with DOS 2.5. I love it! There is another program that frees the area from \$C000 to \$CFFF in the computer, and a program that contains the source code for the high speed SIO routine used in the Sector Copier.

## Happy vs the Duplicator

This section will deal only with the backup programs available from these companies. At this time the only competition for the Happy on the 1050 drive is the 1050 Duplicator from DTI. As it stands, the Happy can backup a 20 sector track without slowing down the drive. Although I've found Rev 2.5 of the Duplicator to have only marginal success in writing a 21 sector track by slowing down the drive, I fully expect further enhancements of the Duplicator's software to make the Happy and Duplicator pretty much even in raw formatting power.

Since I expect the formatting power to be roughly equal, I am looking forward to seeing how DTI goes about backing up programs such as Electronic Arts 34 sector track 'One-on-One'. Happy Computers had to resort to the PDB files and running these on Happy drives only. DTI have promised that by the end of the year they will be able to

copy every piece of software on the market. Their adverts claim these disks will run on any drive. Seems like we have quite a difference of opinion here by the two companies, eh?

In fairness to DTI, these promises were in respect to their Rev 4 software, and at the moment Rev 3 is not even out. It is claimed that Rev 3 (when available) will copy everything on the market except for a protection scheme employing weak sectoring.

They also refer to the Happy operating system as 'antique', and that their operating system had many more routines built-in. What they say about the two operating systems may be entirely true, and I don't wish to discuss the merits of this. But I would like to make a point.

If you take the Happy board and the Duplicator board and place them side by side, you will find each contains a 6502 CPU and a RAM bank. This leaves the operating system chip. This OS chip is nothing more than a software program burned into a chip. Since the only difference here is the program chip, I cannot really see any one board being more powerful than the other. It's the program that counts. Now DTI claim they will succeed, with virtually the same hardware, where Happy could not?

There are two reasons why I believe Happy Computers would not allow this

to happen. The first is since the Duplicator was released well before the release of Rev 7, and since Happy was very aware of DTI's claims before release of Rev 7, I cannot believe Happy would allow such a technically inferior program to exist against a Duplicator with the abilities to write 34 sector tracks. I could understand going up against a competitor 20 sectors to 21. But no, not 20 against 34.

The second reason is this. As I understand it, most, if not all, of Happy's programming is done by a single person. To me, at least, this guy is the Atari disk drive Magic Man. One of the keenest and most innovative programmers to ever sit in front of the keyboard, he is the creator and developer of this type of board configuration, track buffering, the Warp Speed software, and much more. When one buys a Happy, one is buying more than a custom chip; one is buying a piece of this programmer, a programmer with a proven record of excellence. If there was any way to copy these exotic tracks, Happy Computers would have pulled it off.

In any respect, it is not hard to pick a winner in this department between the two boards. But the Duplicator does not have its further revisions released yet, so who knows what it will do? How will they backup tracks with 22 or more sectors? Who knows? Only time will tell...

## A Computer Prayer

From the Computer Funnies Collection.  
By Thomas M. Peters.

*Our OS who art in core  
IBM be thy name  
Thy system come  
Thy crashes done  
On disk as it is in memory*

*Give us this day our daily I/O  
And forgive us our syntax errors  
As we forgive those who have  
erred before us*

*And lead us not into Fortran  
But deliver us from COBOL  
For yours is the mainframe  
and the system and the  
program forever*

*Logoff*

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# STARTING FROM BASICS

by Captain Hacker Part Six

*Welcome to the sixth and final episode of Starting From Basics*

Up until now I have covered many of the fundamental aspects of programming in BASIC which, although essential if you want to do more than just 'fiddle around' with your machine, has probably been rather dull and uninspiring at times! Your knowledge of BASIC should now be at a stage where you are able to understand much more easily the many books and articles available on Atari sound, graphics, and filing systems, but just to start you off in the right direction I will use this last episode to explain some of the more basic principles of the Atari's graphic commands.

## Modes

There are two basic kinds of display format on the Atari, and there are, of course, also variations of each of these types. There are dot modes with various resolutions, or dot size, and character modes with different sized characters. There are sixteen graphics modes available, numbered 0 to 15. You use this number in the GRAPHICS command, i.e. GRAPHICS 2. Let's take a look at the differences between these modes in a little more detail.

## Text Modes

Modes 0, 1 and 2 are the only text modes. Mode 0 is the one which the computer sets itself into when you switch it on, and, as you are probably aware, this gives you 40 characters per line, and 24 lines of text. You can only have one colour on the screen at a time with this mode. Although this can of course be any of the many colours and hues available. Mode 1, however, gives you only 20 characters across the screen, and since it still has 24 lines of text, the characters are elongated. The big advantage though, is that you can have 5 different colours on the screen at the same time! (I will show you how we change colours a little later.) Mode 2 is very similar to mode 1, but there are only 12 lines down the screen, giving a much more evenly proportioned character. Once again, five different colours can appear on the screen at once in this mode.

## Graphics Modes

Modes 3 to 15 are all dot graphics

modes for drawing on the screen. These are of course one of the main features that make programming on the Atari so interesting for many people. These graphics modes offer a whole range of resolutions and colours. But here lies a small problem! You can have very high resolution (i.e. in GRAPHICS 8) or you can have lots of colours, (i.e. GRAPHICS 7 or 11), but you cannot have both.

## Why?

Well, the reason is memory. Graphics mode 8 has the highest resolution, giving a screen with 320 dots across and 192 dots down. To store the data for this screen with just the one colour (i.e. each dot, or pixel, either on or off) takes up an astonishing 8138 bytes of memory! When you consider that the Atari eight-bit machines were designed back in the days of expensive memory, it is not difficult to see that it would have proved rather expensive to provide mode 8 with lots of colours.

## Invoking Graphics Modes

Enough of the theory, let's try something practical now. Switch on your computer (with BASIC installed!), and type the following line:

```
GRAPHICS 7
```

You should see the screen go black except for 4 lines on the bottom, where the 'READY' prompt is now printed. This is called the split-screen mode, and I will show you later how to eliminate these four lines of MODE 0, but for experimenting, it is ideal. The screen is now ready for you to draw lines on it. Type the following line, but don't worry about what it does for now (all will be revealed in good time).

```
COLOR 1
```

You won't have seen anything happen yet, but now enter the following line:

```
PLOT 0,0
```

Now, there should be a tiny dot in the top left hand corner of the screen. Imagine that the screen is a piece of graph paper, and that it is labelled 0 to 159 along the top edge (from left to right) and from 0 to 95, along the left

edge (from top to bottom). This is how the screen is laid out, and we plot and draw on it just as we would on a piece of graph paper!

So how do we draw on our graph paper? Well, we use the command DRAWTO. Type the following command:

```
DRAWTO 50,50
```

Notice that this draws a line from the position 0,0 to the position 50,50. Remember that we used the PLOT command to light pixel 0,0, well this left an invisible cursor at this location, so that if you used, as we have done, a DRAWTO command it will know where to draw from. Now type this:

```
DRAWTO 100,0
```

Which of course draws another line, but this time the invisible cursor was left at the location 50,50 by the previous DRAWTO command.

## Colours

Now for the tricky bit – playing with colours! Type the following two lines:

```
COLOR 2  
DRAWTO 100,50
```

The first two lines we drew on the screen were orange, but the last one was green. Try the following two lines:

```
COLOR 3  
DRAWTO 0,50
```

This time the line is blue, and you should now have three different colours on the screen! As you have seen, we appear to have selected our colours by using the COLOR command, but this, however, is not the whole story. For each pixel on the screen, in graphics mode seven, the number 0 to 3 (2 bits, in fact) is stored to say which colour it should be. A value of zero is used for the background colour, i.e. a pixel with colour zero is said to be off. These values do not refer to fixed colours, though, since this would be rather limiting to say the least. Instead, they are used to refer to colour registers.

These colour registers contain the colour mixture that is displayed on the screen for each pixel with a relevant colour register value. This facility is

called the PALETTE system, because it is similar to the way an artist might have painted his picture — he would hold his mixing palette in his hand, and may only have say, four mixing cups in his palette. Consequently for a given painting, (assuming he does not change his palette during the painting!) he can only have four different colours available at a time, but he can mix these four into whatever colours he might want, from his main store of paints.

In other words, in mode seven you can have only four different colours on the screen at once (including the background), but you can make them whatever colour you want. The difference between our painted picture analogy and the computer is that you can change the contents of these registers at any time, and that if you do, any pixels on the screen which were plotted or drawn with the corresponding colour register will change instantly to the new colour. You can think of the COLOR command as dipping your imaginary paint brush into a different one of the four palette paints, i.e. any further brush strokes (using PLOT or DRAWTO) will use this colour until another COLOR command is issued.

## Mixing The Palette

When the graphics seven command is issued, the four registers are re-set to certain colours. These are referred to as the default colours for mode seven, and they are as follows:

COLOR REGISTER	DEFAULT COLOUR
0	Black
1	Orange
2	Light Green
3	Dark Blue

Suppose, though that you decide that you want to change these colours, how would you do this? You would in fact use the SETCOLOR command. With most television sets, thin lines don't show their colours very well, so Listing 1 is a short program which will place three wide coloured bars on the screen.

The program attempts to display four colours onto the screen, but, as you can see, there are in fact only 3 showing. This is because the COLOR register zero is the background colour, and although this might seem rather pointless it is in fact useful as a way of erasing, or deleting lines or pixels. In order to change the colour of one of the registers we must specify three things. These are:

- The register we want to change
- The new colour's value
- The brightness level we wanted

The register value is not quite as straightforward as it should be, since the number used in the COLOR statement

```
PC 10 GRAPHICS 7
YK 20 COLOR 0
KT 30 FOR I=5 TO 15
NL 40 PLOT 0,1:DRAWTO 159,1
IT 50 NEXT I
YY 60 COLOR 1
RY 70 FOR I=20 TO 35
NP 80 PLOT 0,1:DRAWTO 159,1
IX 90 NEXT I
XU 100 COLOR 2
GM 110 FOR I=40 TO 55
UB 120 PLOT 0,1:DRAWTO 159,1
FX 130 NEXT I
YN 140 COLOR 3
IY 150 FOR I=60 TO 75
UL 170 PLOT 0,1:DRAWTO 159,1
GH 180 NEXT I
```

Listing 1.

is not the same value as the number used for that register in the SETCOLOR command! Take a look at Table 1, (in the mode 3, 5 and 7 section) and you will see what I mean, for example if you want to change the colour of a pixel or line drawn using the command COLOR 1 you will have to use the value of 0 in the SETCOLOR command.

As for the colour value itself, these are shown in Table 2, and as you can see there are 16 basic colours available to you. The brightness level must be an even number from 0 to 14, where 0 is dark and 14 is bright.

By now you probably know enough to be able to change the colours yourself, but in case you are still not sure, here are a few examples for you to try. You should run Listing 1 to put your screen into mode 7 and to draw the thick colour bars on your screen.

Type the following commands, which demonstrate how to change these colours.

SETCOLOR 0,3,4

You should notice the second bar (remember that the first one was drawn in the background colour of black) changes colour from orange to red.

SETCOLOR 0,3,8

This time the colour has not changed, but the brightness has, we now have a bright red bar.

SETCOLOR 1,6,8

SETCOLOR 2,4,6

Now each of the three bars is a different colour, but what about the background? At the moment this is still black, so type the following command:

SETCOLOR 4,10,4

You should now see the whole background change colour. Don't forget that we can use this background colour to plot over other lines on the screen by using COLOR 0.

Take a look at Table 2. Here is a list of colours available to you that you can call using the SETCOLOR command. The colours which actually appear on

Mode or Condition	Default Colours	SETCOLOR Colour Register No.	Colour	Comments
Mode 0 and all text windows	LIGHT BLUE	0	Colour data	—
		1	actually determines character to be printed.	Character luminance (same colour as background)
		2		Background
		3		—
Modes 1 and 2 (text modes)	DARK BLUE	4		Border
		0	Colour data	Character
		1	actually determines character to be printed.	Character
		2		Character
Modes 3, 5, and 7 (four colour modes)	BLACK	3		Character
		4		Background, border
		0	1	Graphics point
		1	2	Graphics point
Modes 4 and 6 (two-colour modes)	BLACK	2	3	Graphics point
		—	—	—
		—	—	—
		4	0	Graphics point (background default), border
Modes 8 (1 colour, 2 luminances)	BLACK	0	1	Graphics point
		—	—	—
		—	—	—
		4	0	Graphics point (background default), border
Mode 8 (1 colour, 2 luminances)	BLACK	1	1	Graphics point luminance (same colour as background)
		2	0	Graphics point (background default)
		—	—	—
		4	—	Border

Table 1. Mode, Setcolor, Color

your screen may differ somewhat from those in the table, but this is quite normal, as television sets do vary, particularly as you vary the brightness of the colours.

The other graphics modes (3 to 6) operate in the same way as mode 7, except that the number of pixels per screen (the resolution) will vary, as will the number of colours you are able to have on the screen at one time.

Colours	Setcolor Numbers
GREY	0
LIGHT ORANGE (GOLD)	1
ORANGE	2
RED-ORANGE	3
PINK	4
PURPLE	5
PURPLE-BLUE	6
BLUE	7
BLUE	8
LIGHT BLUE	9
TURQUOISE	10
GREEN-BLUE	11
GREEN	12
YELLOW-GREEN	13
ORANGE GREEN	14
LIGHT ORANGE	15

Table 2. Hue numbers

## The Text Modes

Modes 1 and 2 are the two large text modes. With these modes all five colours can be used, but they are not selected using the COLOR command. Instead, the case and inverse video selection of letters decide which colour the characters appear as. Confused? Well let me explain.

Type GRAPHICS 1. Now comes the problem, for if we use a normal PRINT command to print a string, it will appear in the bottom four lines of the screen, in the small mode 0 section. To print a word into the mode 1 section you must use the following format:

PRINT #6;"ATARI"

You need not concern yourself with the reason for this, but if you are interested, it is because the operating system opens the display as it would open a file, and it uses channel six to do so. So how do we print using a different colour?

Try entering the same command, but this time, enter the word 'Atari' in lower case letters. Now you should see it printed in a different colour, but still in upper case. Enter the same command once again, but this time enter the word ATARI in upper case and inverse video. You should see the word ATARI printed in yet another colour, (but once again it will be in upper case, and normal video). And last, but not least, try the command with the word 'Atari' printed in lower case and inverse video. The fourth colour should now be on the screen.



You can now change these colours, just as you did with the mode 7 bars, using the SETCOLOR command. You should now try experimenting with each of the graphics modes. Take a look at Table 3, where you will see mode 1 to 8 listed with their relevant COLOR, SETCOLOR statements and default colours.

## Getting a Full Screen

Although by default the graphics screens have 4 lines of mode zero text, these can be eliminated by simply adding 16 to the mode number, i.e. GRAPHICS 7+16. If you let a program

STOP, however remember that the operating system will clear the whole screen to mode zero so that BASIC can print its 'READY' message!

## And Finally

By now, hopefully, you will have grasped the concept of the ATARI's colour system. Armed also, with the help of this series, with a good grounding in ATARI BASIC (if not, then buy your back issues quickly!) you should now be able to investigate the vast possibilities available with your ATARI home computer. Here's wishing you lots of luck, and many hours of fun.

## SCREEN FORMAT

Graphics Mode	Mode Type	Columns	Rows —	Rows —	Number of Colours	RAM Required (Bytes)	
			Split Screen	Full Screen		Split	Full
0	TEXT	40	—	24	1-1/2	—	992
1	TEXT	20	20	24	5	674	672
2	TEXT	20	10	12	5	424	420
3	GRAPHICS	40	20	24	4	434	432
4	GRAPHICS	80	40	48	2	694	696
5	GRAPHICS	80	40	48	4	1174	1176
6	GRAPHICS	160	80	96	2	2174	2184
7	GRAPHICS	160	80	96	4	4190	4200
8	GRAPHICS	320	160	192	1-1/2	8112	8138
9	GRAPHICS	80	—	192	1	—	8138
10	GRAPHICS	80	—	192	9	—	8138
11	GRAPHICS	80	—	192	16	—	8138
12	GRAPHICS	40	20	24	5	1154	1152
13	GRAPHICS	40	10	12	5	664	660
14	GRAPHICS	160	160	192	2	4270	4296
15	GRAPHICS	160	160	192	4	8112	8138

Table of modes and screen format

# USER GROUP SOFTWARE

## Software Librarian - Roy Smith

Due to demand from members there are now two ways to get programs from the library. The original scheme of exchanging '3 for 1' will still apply, but now with an added bonus. So the library rules have been extended to enable those members who cannot write their own programs to gain access, and those that can to have a possibility of some reward for their efforts. The extended library rules are as follows:

### 3 FOR 1 EXCHANGE

1. Every program you donate to the library entitles you to three programs in return.
2. The program you donate must be your original and not copied.
3. Your donated program must be submitted on a cassette or a disk, programs in the form of print-outs will not be processed.

4. If your program requires any special instructions they should be added in the form of REM statements within the program (or you may present them as instructions when the program is actually run).
5. BONUS. Every program donated per quarter (between issues of the newsletter) will be eligible to be judged 'STAR PROGRAM' for that quarter. This carries a prize of £10 which will be paid to the author from the club funds. The programs will be judged by the Editorial Team and their decision will be final. The Editorial Team are not eligible for the prize.
6. The '3 FOR 1' exchange is only open to club members.

### DONATION SCHEME

1. Every club member will be

entitled to ask for up to 3 programs per quarter from the library by donating to the club funds.

2. If a member does not take his/her entitlement for a particular quarter, it cannot be carried forward to the next quarter.
3. A member can have more than one quarter's entitlement at one time (up to a maximum of 12 programs (1 year)), but then will be unable to ask for more until his/her credit quarters have been used. Note that odd numbers of programs will be counted in quarters, i.e. if a member asks for 5 programs, the first 3 will be that quarter's entitlement, the next 2 will be the second quarter's entitlement and he/she will have to wait until the third quarter before he/she is entitled to any

more. Also note that having programs in advance will only be allowed if that member's membership covers the advance quarters.

4. The donation fee will be £1 per program and is not refundable. Cheques and Postal Orders are to be made out to the 'U.K. Atari Computer Owners Club'.
5. Members must send in a blank cassette or diskette for the chosen programs to be recorded on.
6. The 'DONATION SCHEME' is only open to club members.

Finally I would like to point out that some people omit to include return postage when donating to the library, so please do not forget to include 30p worth of stamps to cover this.

## THE LIBRARY SOFTWARE SERVICE IS FOR MEMBERS ONLY

# LIBRARY SOFTWARE TITLES

### Games

#### MOTORWAY

by Stephen Taylor - London.  
Fruit machine game, but with a motorway theme instead of cars.  
Runs in 48K min. Disk only.  
XL/XE only.

### Home Entertainment

#### NAME & AGE

by N. Williamson - Sutton.  
Mathematical calculations for kids.  
Runs in 16K Cassette or Disk min.

#### PICK-A-TUNE

by N. Williamson - Sutton.  
Words are presented for you to sing along to 10 different tunes.  
Runs in 16K Cassette or 32K Disk min.

### Demos

#### SINEFOUR

by G. F. Bradwell - Solihull.  
Four sine waves are displayed in GR.8 and added to give a result.  
Runs in 16K Cassette or Disk min.

### Utilities

#### DISKDIS

by Mike Barnard - Guisborough.  
See what's on your disk with this disassembler.  
Runs in 16K min. Disk only.

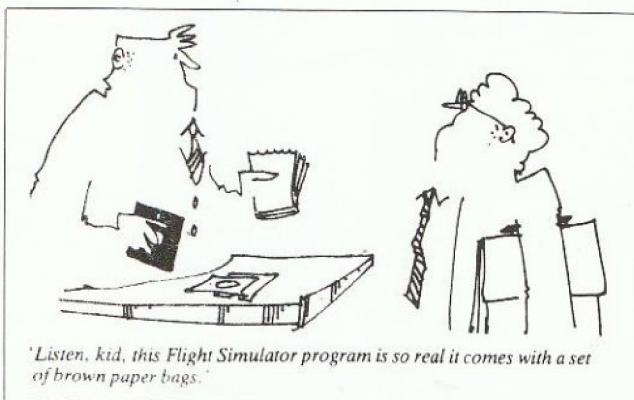
#### DOS9XL

by Mike Barnard - Guisborough.  
Make a special binary load disk which uses only 9 sectors for its DOS.  
Runs in 32K min. Disk only.

Listed below are the software titles received by members for inclusion in the library since issue thirteen was published. As the library now contains over 300 programs, it is getting a bit too large to keep on printing the entire list. Eventually it would probably take over the whole magazine and there would be no room left for the articles and program listings. For those of you who are new members and do not know what is available from the library, then send for a photocopy of the complete list which is available from the librarian. There is a small charge for this service to cover photocopying costs. If you would like a list please send 50p and a S.A.E. for return.

### TOP TEN

- |    |                       |                              |
|----|-----------------------|------------------------------|
| 1  | (1) Home FM           | Mike Barnard                 |
| 2  | (6) Magazine Database | Alan J. Palmer               |
| 3  | (3) Cad/Cam           | Jack Gilchrist & Phil Havens |
| 4  | (2) Fujiboink         | Unknown                      |
| 5  | (4) Composed Writer   | Larry Farmer                 |
| 6  | (8) General Ledger    | Neville R. Will              |
| 7  | (9) Shuttle Challenge | Matthew Trimby               |
| 8  | (-) Cad/Cam Editor    | D. J. Canning                |
| 9  | (10) Multilabel Maker | C. P. Weldon                 |
| 10 | (-) Pengo             | Jones & Alan Ransom          |



'Listen, kid, this Flight Simulator program is so real it comes with a set of brown paper bags.'

#### LEAGUE TABLE DATABASE

by A. Furnell - Chatteris.  
Type in league results and calculate league tables, individual team performance can be examined.  
Runs in 48K min. Disk only.

#### MULTI 2

by Mike Barnard - Guisborough.  
Poly-copy program for single and double density Multi-boot disks.  
Runs in 48K min. Disk only.

#### PAGEFLIP

by N. Williamson - Sutton.  
Short program for setting out pages of instructions in a program.  
Runs in 16K Cassette or Disk min.

#### SHOPPING LIST

by N. Williamson - Sutton.  
This program prints out a housewives shopping check list on the 1020.  
Runs in 16K Cassette or Disk min.

### ★★★★ STAR PROGRAM ★★★★★

#### 80 COLUMN CALENDAR

by D. Wade - Leicester.  
Displays a calendar for inputted year in 80 column characters all on one screen.  
Runs in 16K Cassette or 32K Disk min.

### ★★★★★★★★★★★★★★★★★★★★

### Education

#### FLAGS

by N. Williamson - Sutton.  
Three programs that create the national flags and anthems of the U.K., Canada and Australia.  
Run in 32K Cassette or Disk min.

ATARI XL/XE				COMPUTERWARE DEPT. M, PO BOX 318, STOKES-ON-TRENT, ST6 6UX ALL ITEMS ARE USUALLY DESPATCHED WITHIN 24HRS.				ATARI XL/XE			
TITLE	CASS	DISC	TITLE	CASS	DISC	TITLE	CASS	DISC	TITLE	CASS	DISC
ACTION BIKER	1.00	-	LORDS OF TIME	8.00	-	WAR COPIER	6.50	-	WAR COPIER	6.50	-
AIRWOLF	7.50	-	MERCENARY	7.50	10.50	WARNAK	1.70	-	WARNAK	1.70	-
ALTERNATE REALITY	-	15.00	MERCENARY COMPENDIUM	12.50	15.00	WORM IN PARADISE	7.50	-	WORM IN PARADISE	7.50	-
ALTERNATE REALITY 2	-	15.00	MOVIE MAKER	-	14.00						
ARCADE CLASSICS	8.00	-	MONTEZUMA'S REVENGE	6.00	12.00						
ASYLUM	8.00	12.00	NINJA	2.50	-						
AZTEC	8.00	12.00	NINJA MASTER	1.00	-						
BALLBLAZER	8.00	12.00	NUCLEAR NICK	2.50	4.00						
BEER BELLY BERT	2.50	4.00	OLLIES POLLIES	2.50	-						
BOULDERDASH 2	8.00	12.00	OLYMPIC SKIER	2.50	-						
CASTLE ASSAULT	1.00	-	PRICE OF MAGIC	6.00	-						
CAVERNS OF ERIBAN	1.70	-	RACING DESTRUCTION SET	-	12.00						
CHICKEN CHASE	2.50	-	RAID OVER MOSCOW	8.00	12.00						
CLOAK OF DEATH	2.50	-	RED MOON	5.50	-						
COLOURSPACE	6.50	-	RESCUE ON FRACULAS	8.00	12.00						
COLLAPSE	1.00	-	RETURN TO EDEN	8.00	-						
COLLOMBUS CHES	8.00	-	SCOOTER	2.50	4.00						
CRUSADE IN EUROPE	11.00	-	SECOND CITY	5.00	-						
CRYSTAL RAIDER	1.70	-	SHAMUS	2.50	-						
DARTS	1.00	-	SILENT SERVICE	-	15.00						
DECISION IN THE DESERT	-	15.00	SMASH HITS VOL 4	8.00	12.00						
DIAMOND MINE	1.00	-	SMASH HITS VOL 5	8.00	12.00						
DROP ZONE	7.50	11.00	SMASH HITS VOL 6	8.00	12.00						
DUNGEON ADVENTURE	8.00	-	SOCCER	1.00	-						
EMERALD ISLE	5.50	-	SPELLBOUND	2.50	-						
ENCOUNTER	7.50	10.50	SPIFFIRE 48	8.00	-						
FIGHTER PILOT	8.00	10.50	SPY HUNTER	7.50	11.00						
FOOTBALL MANAGER	7.50	-	SPY V SPY 2	7.50	12.00						
GHOSTBUSTERS	8.00	-	STARQUAKE	7.50	10.50						
GO FORTH	-	21.00	STEVE DAVIS SNOOKER	7.50	10.50						
GREATEST HITS	8.00	12.00	SUBMARINE COMMANDER	1.00	-						
HARD BALL	8.00	-	SUN STAR	7.50	12.00						
HULK	2.50	-	TECHNICOLOUR DREAM	8.00	10.50						
JEWELS OF DARKNESS	12.50	10.50	ULTIMA 4	-	15.00						
KENNEDY APPROACH	11.50	14.00	VEGAS JACKPOT	1.00	-						
KING SIZE	8.50	-	VIETNAM	-	12.00						
KIK START	1.00	-	WARRIORS OF RAS	8.00	11.00						
KORONIS RIFT	-	12.00	WAR COPIER	6.50	-						
LAST VB	2.50	-	WARNAK	1.70	-						
LEADERBOARD	8.00	12.50	WORM IN PARADISE	7.50	-						

All software consists of genuine, brand new, original titles.  
 Prices include post & packing (orders of less than £5.00 in total please add 50p)  
 Overseas add £1.00 for 1st item then 50p for each additional item.  
 Subject to availability, all software is usually despatched within 24 Hrs.  
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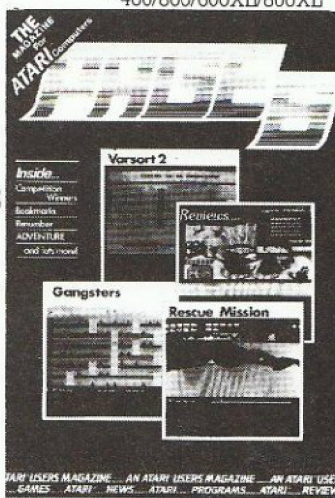
# PAGE 6 THE MAGAZINE

FOR ALL ATARI COMPUTER\* OWNERS

\*400/800/600XL/800XL



NEWS  
REVIEWS  
TUTORIALS  
UTILITIES  
HINTS & TIPS  
plus more



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## 2 BIT SYSTEMS: MUSIC PRODUCTS FOR THE 48K ATARI

### REPLAY

Replay is a complete sound sampling system that allows you to produce real speech/music on any 8-Bit ATARI.

#### Features:

- \* Sample rate selectable from 6KHz to 21KHz
- \* Sample playback through TV/Monitor
- \* Allows samples to be used in your own Basic programs
- \* Supplied on cartridge, no user memory lost
- \* Records from HiFi or external recorder

Also included in the REPLAY package (available separately).

Digidrum: Digital drum sequencer (no hardware required), allows you to create your own Drum rhythms using 8 sampled drum sounds.

Digisynth: Simple sample sequencer (no hardware required) allows you to play tunes using sampled sounds (dog barks, guitars, voices etc.).

#### PRICES

REPLAY system (cartridge, software, Digidrum and Digisynth) only £39.95.  
DIGIDRUM/SYNTH twinpack only £4.95.

### MIDI MASTER

A full feature MIDI interface for your ATARI, allows you to take full control of synths, drumkits etc.

#### Features:

- \* MIDI in/out cables for easy connection
- \* 8 Track Real time sequencer with tempo correction.
- \* Casio CZ series voice editor (allows you to edit and store voices on Disk/Tape)
- \* Yamaha DX100/21 series voice editor
- \* Music player program (allows you to play tunes from Music composer or AMS via MIDI)

NB: We will be producing other voice editors for different synths, so if you own a different synth, get in touch.

#### FUTURE RELEASES

To enhance MIDI MASTER to include a 16 track polyphonic sequencer and a score writer.

#### PRICES

MIDI MASTER interface plus software £27.50.

### PERCUSSION MASTER

A high quality professional drumkit for the ATARI.

#### Features:

- \* External D/A and filter to ensure high quality sound
- \* 9 Sampled drum sounds
- \* Polyphonic Rhythm editor using pull down menus and windows
- \* Capability to load new drum sounds from Disk/Tape
- \* Includes enhanced version of REPLAY software, allowing REPLAY owners to sample sounds with a far greater resolution.

\* 3 Channel polyphonic  
\* 100 song entries  
\* Audio output via hi-fi

#### PRICE

PERCUSSION MASTER hardware + software £29.95.

COMING SOON!!!

ST REPLAY +

DIGIDRUM II

DX 7 VOICE EDITOR

### ORDER FORM

Please send me:

- ☐ Replay System(s) on Disk/Tape\*
- ☐ DigiDrum/Synth Twin Pack(s) on Disk/Tape\*
- ☐ MidiMaster Interface(s) on Disk/Tape\*
- ☐ Percussion Master System(s) Disk/Tape\*

I enclose a Cheque/Postal Order\*

for £ (Payable to 2 Bit Systems)

\* Delete as applicable

Name .....

Address .....

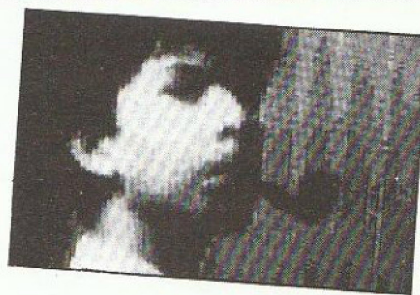
Postcode .....

Send to: 2 Bit Systems, 44 Morcom Road, Dunstable, Beds. LU5 4EG.

M12/86

# VIDEO DIGITISER REVISITED

by Martin Bann



Way back in Issue 10 of Monitor, details were given of a Video Digitiser, designed by Mark Brighton, that was subsequently published in the December/February edition of 'Electronics - The Maplin Magazine'. The design of the digitiser itself was excellent but the only problem with it was that it required a computer that had one input and one output port. This ideally suits the old 400/800 Atari computers as the four joystick ports provide just what is needed. Unfortunately the newer XL and XE range only possess two such ports, thus the owners of these machines are deprived of the fascinating possibilities of digitised pictures, (at least for Mark's design anyway!).

Don't despair XL/XE owners, all is not lost! In Figure 1 I have shown a circuit that will enable any computer with just two joystick ports to be used with the digitiser. The ports are set up as input ports and a byte is sent to a specific

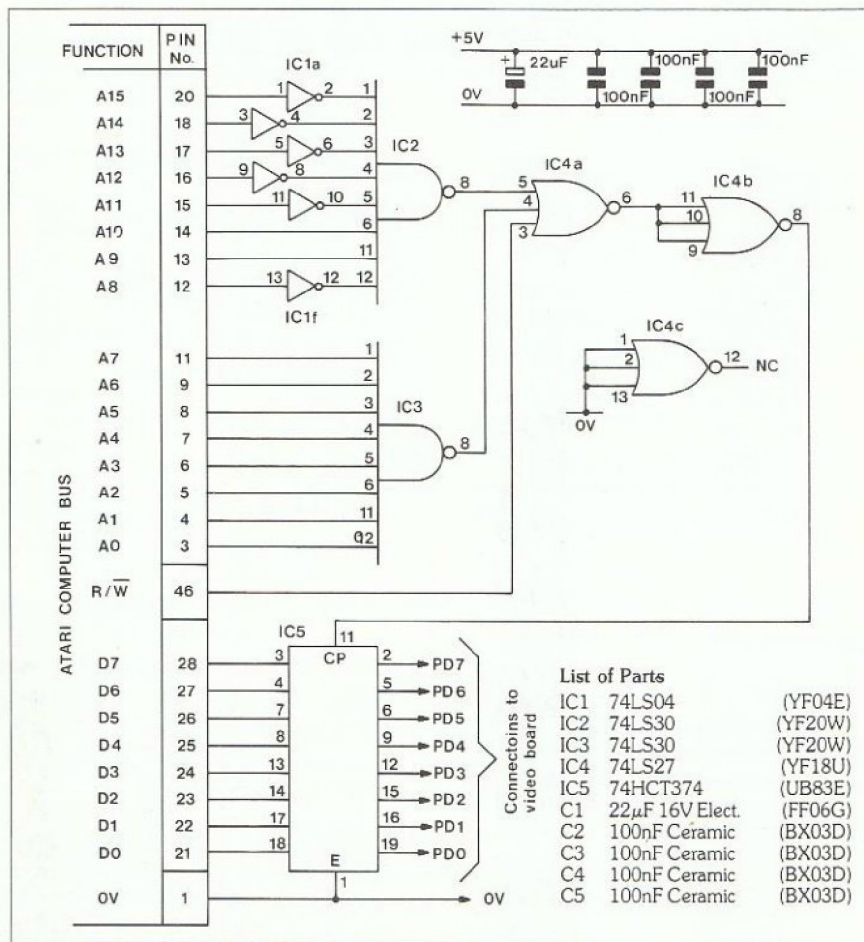
memory location which enables the circuit connected to the computers data bus. The circuit will read and store this byte, which would then be passed on to the inputs of the two 74HC161's. The digitiser would then function as normal, i.e. instead of sending the 'position byte' to the output port you send them to a specific memory location, the circuit does the rest.

When the address on the computers Address Bus is 1791 (dec). 06FF (hex), 0000 0110 1111 1111 (binary), the outputs of IC2 and IC3 will go low. When the R/W line goes low, i.e. the CPU is in the write mode, the output of IC4a will go high. This is inverted by IC4b which sets pin 11 of IC5 low. During this process the computer would have set up the Data Bus to the levels determined by the data poked into the memory location 1791 (dec). Therefore, the inputs of IC5 will be at the correct levels. When the signal on pin 11 of IC5 goes low it will transfer the data at it's

input to it's internal registers. When pin 11 then goes high, through the computer setting up a different address, IC5 will transfer whatever data is in it's internal registers to it's output pins, these pins being connected to the input port of the digitiser. Any subsequent Data Bus changes occurring will not affect the output signals on IC5, until pin 11 goes low then high.

The only changes to the machine code listing shown in the original article are that the label in line 30 called PORTB should be given the new address of 06FF (hex) and lines 50, 370, 410, 420 and 440 are deleted.

Figure 2 shows the connector in the back of the Atari computer, viewed looking into the back. You will need a suitable connecting socket and Maplin Electronics have one available under the part number FG23A; it will need to be cut to the required length however. The blank position on FG23A can be ignored as positions 41 and 42 on the Atari edge



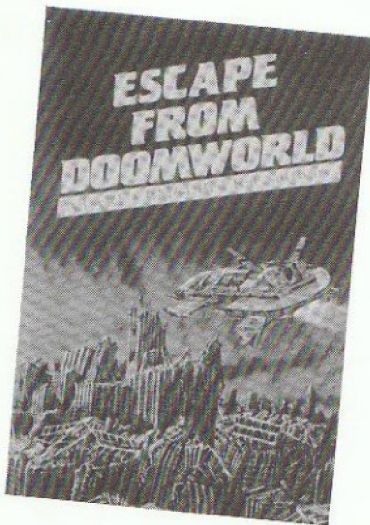
## HOT GOSSIP

### Nine plus Four

Level 9, the well known adventure wizards, have signed a contract with satirical authors, Delta 4, for a spoof adventure to be published next Easter. One of Delta 4's best known works is 'Bored of the Rings', but the title and subject of the new adventure is being kept secret until after Xmas.

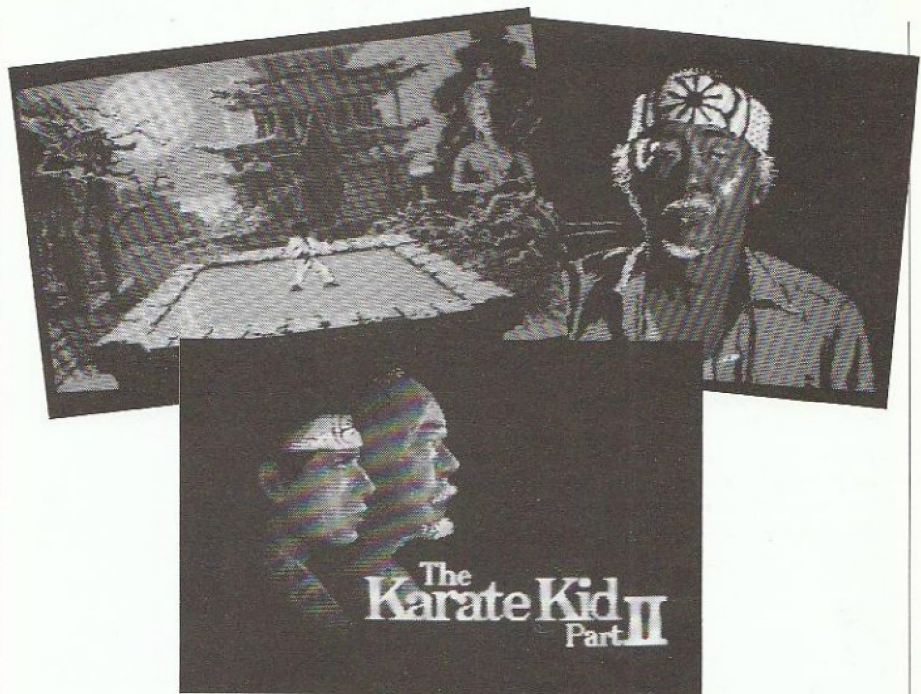
### Red Rat do it Again!

Following closely on the heels of their new releases Laser Hawk and Domain of the Undead, Red Rat are bringing out two new games in December. The first is 'Escape from Doomworld' in which 5 leading Earth scientists are held captive by plug-uglies on Doomworld, and they must be rescued before their knowledge can be used against all of humanity. It is claimed to be '3 arcade games in 1' and will retail for £5.95 on disk or £3.95 on tape. The second release is 'Space Gunner' which is a 'have spacesuit will zap aliens' type arcade game. Retail prices are £4.99 for floppy or £2.99 for cassette.



### It's all in the Mind!

The Mind Tuner is a 'unique program that uses proven psychological principles to help manage stress, and to improve personality and performance. It is a simple and effective tool for self-improvement and uses visualizations, positive affirmations, and subliminals to get your subconscious to work for you.' Well that's what Mind Link Communications Inc. claim for their product. Who are we to dispute them. If you have a 48K 8-bit Atari computer with a disk drive and this is of interest to you, you can get more information from the said company at Box 488, 36 Adelaide Street East, Toronto, Canada M5C 2J6. P.S. the price is around \$35 Canadian.



### Musical Interlude

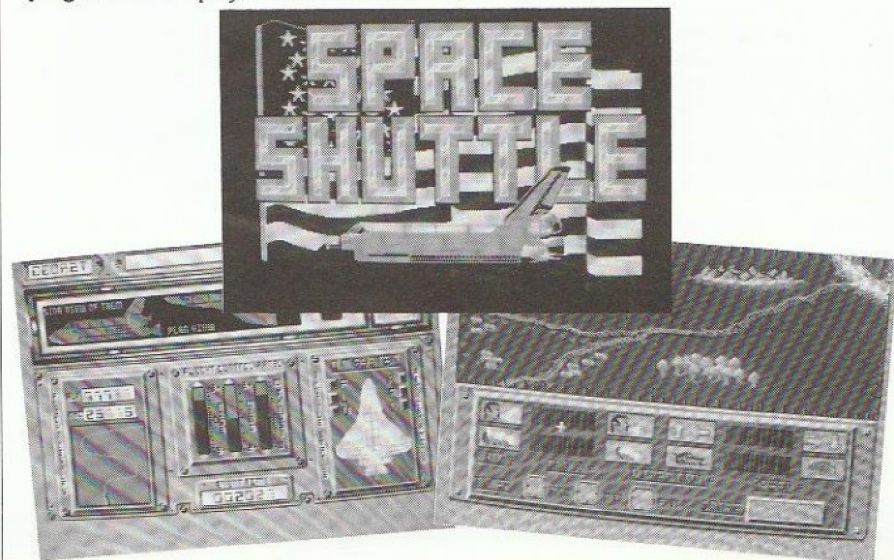
2 Bit Systems have announced two new programs for the 8-bit Atari and a professional sound sampling system for the ST. One of the 8-bit programs is a 16 track sequencer for use with MIDI-Master MIDI Interface. The other is DigiDrum II which features 9 sampled sounds, all drums sampled at 16kHz, pull down windows, 2 drum polyphonic and no extra hardware is needed.

ST Replay Plus features variable sample rates, samples played through your TV or Hi-Fi, connection via the cartridge port. The software consists of the Replay sampling system which includes editing, waveform display, reverse and trigger options; ST-Digidrum which is a high quality polyphonic sample sequencer; ST-Echo which is a digital echo program for your special effects; and in addition you can load samples into your own Basic programs. ST Replay Plus costs £89.95.

### Marvels from Microdeal

Look out for two new superb programs from Microdeal. Shuttle II is a true to life shuttle mission to retrieve a faulty communications satellite, that you can enjoy from the comfort of your own armchair. First you play the Mission Controller, deciding on the launch position, the effect of winds, re-entry trajectory, which runway to land on, etc. Then you become the shuttle pilot and try to guide your ship through its mission. Available on ST disk for £24.95.

Karate Kid II will probably turn out to be a classic on the ST. Advance publicity photos of some screens from the game were shown at the PCW show, and they stopped everybody in their tracks. You can miss every other program that's around, but don't miss this one!



## MONITOR ON DISK

Like the look of a program but can't find the time to key it in? You've asked the wife three times to do it for you whilst you're out at work, and she still hasn't. Or maybe you have typed it in but it won't run, then why not take all the effort out of it and send for the MONITOR DISK. All the main programs in each issue of MONITOR are now available pre-recorded on disk for you. They cost £4.95 which includes postage and packing, send a cheque/postal order made payable to the 'U.K. Atari Computer Owners Club' to Monitor Magazine, P.O. Box 3, Rayleigh, Essex. If you live in Europe add 50p, if outside Europe add £1.00. Please allow 28 days for delivery.

### Monitor Disk 8.

Includes: Quickplot, a fast Graphics 8 Plot/Drawto handler. Nightmare Reflections, an exceedingly frustrating adventure. Matchbox, improve your concentration with this memory game. Interrupts, 5 demo programs showing various uses of interrupts.

### Monitor Disk 9.

Includes: Keyo, a new typing checker. Multiboot Bootbase, database program for

'Multiboot disks'. Binload, binary loads from BASIC. Happytyper, automatic line numbering. Ramdisk, for use with the 130XE. Fast Fill, a speedy shape filling utility.

### Monitor Disk 10.

Includes: 3D Maze, escape from the maze in time if you can. PCB Paranoia, destroy your enemies before they get you. Disk Jacket, useful program for making your own disk covers. Chase, an excellent game, not to be missed.

### Monitor Disk 11.

Includes: Hexadecimal Code Generator, better presentation for your programs. Cracking the Code, seven mini progs from the series. RAM Talker, with a little bit of hardware and this program, you can hear your own voice, (for 400/800 only). Bonus Program: HomeFM, a useful utility for use with Home Filing Manager to give quick access to data disks.

### Monitor Disk 12.

Includes: Another Boring Space Invaders Game, unlike its name suggests this game is rather good and lots of fun. Get Motorised;

four programs for use with the circuits described in this interesting article. Mini-adventure; can you escape in one piece? Cracking the Code; BASIC listing and assembler code for a drawing program. Opening Out, five useful programs for disk drive owners.

### Monitor Disk 13.

Includes: Demon, the Baron's demon has escaped and it's after you! Pageflipper, BASIC and source code listings for page flipping techniques. Cracking the Code, BASIC and source listings for player/ missile movement. Adventure Column, data decompression program. Bonus Program: Pengo, excellent BASIC version of the well-known Penguin game.

### Monitor Disk 14.

Includes: Deathzone, superb action game in which you must kill the alien pods and escape from the Deathzone. Cracking the Code, display list program in BASIC and source code. Adventure column, excellent sentence analyser program. Bonus program: Motorway, novel fruit machine simulation but with a motorway theme.

## BACK ISSUES

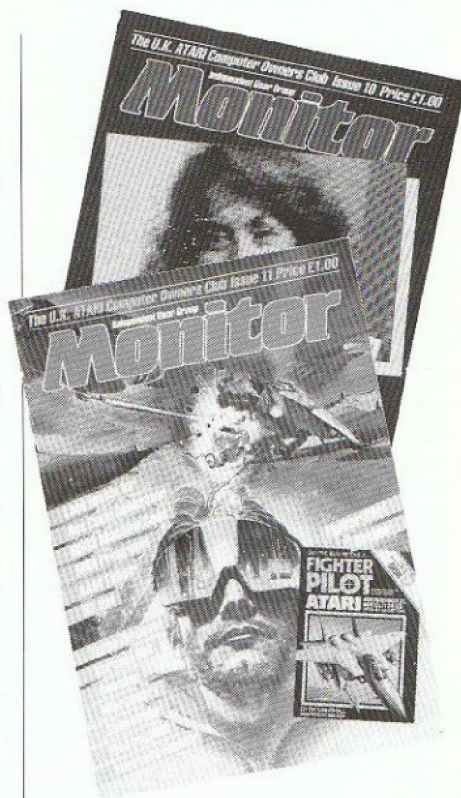
Previous issues of this magazine are obtainable from the club for £1 plus 30p postage each. They contain many interesting and informative articles, hints & tips, program listings for you to input, reviews and practical advice. If you have missed out send for your copies of back issues today! Please note that issues 1, 2, 3, 4, 5 & 7 are already sold out.

### Issue 6.

Includes a useful tutorial showing how to print Micropainter and Versawriter pictures, also contains a terrific program demonstrating 80 characters across the screen. A new regular column for adventure enthusiasts is started to give reviews of adventure games and give hints and tips on how to play them. Part two of Cracking the Code continues with addressing modes and binary sums. The hardware design for a Light Pen is shown together with some simple programs use with it once you have built it. Fun with Art from Epyx is reviewed and some of the excellent results of using this package are shown. Programs include Planetron and a RTTY listing for use with a short wave band radio, the Atari 850 interface and a signal terminal unit (such as the Maplin TU1000).

### Issue 8.

Contains a preview of the new Atari computers. Two new series start, one about how files work and the other 'Starting from Basics' for beginners. Cracking the code continues and concluding part of 'Interrupts' discusses horizontal and vertical scrolling. The adventure column includes reviews of Mask of the Sun and Sorcerer. Other reviews include Conan, Spy vs Spy, Alley Cat and Ghostbusters. Programs are Matchbox, a concentration game, Quickplot, a Graphics 8 Plot/Drawto utility and Nightmare Reflections, an exceedingly frustrating adventure.



### Issue 9.

Includes a RAMDISK for the 130XE as well as a review of this excellent machine. Introduction to MIDI, just what is it! KEYO typing checker program. Utility to give binary load files from Basic. Reviews of TopDOS, Homeword and Mr DO! Overview of FORTH as an alternative to Basic. Utility to fill in shapes in Graphics 8 and fast too! Profile on Lea Valley Atari Club. HAPPY TYPER gives automatic line numbers and programmable function keys. Utility for indexing 'Multiboot' disks.

### Issue 10.

Includes all the facts about Digitised Pictures. Disk Jacket, a neat program for making your own disk covers. Opening Out, more about how files work. Reviews of the Great American Road Race, Kennedy Approach, Red Moon, Asylum and Wishbringer. Two excellent games: PCB Paranoia and 3D-Maze. Introduction to the world of communications. Continuation of regulars: Cracking the Code, Starting from Basics and What's MIDI?

### Issue 11.

Includes RAM Talker for 400/800 machines. Reviews of Atariwriter Plus, Sidewinder, Koronis Rift, Electraglide, Mercenary, Fighter Pilot, Goonies and Alternate Reality. ST MIDI programs and ST hires Hat. Hexadecimal Code generator and some book reviews. Plus Starting from Basics and Cracking the Code.

### Issue 12.

Includes: Get Motorised, add-on circuits for various motors. Another Boring Space Invader's Game, but it isn't, boring that is! Part 3 of Opening Out discusses disk file handling techniques. Read all about Matrices and Arrays, and the adventure column shows how to write your own adventure. 8-bit reviews include Technicolor Dream, Eidolon and Action Biker. ST reviews include DB Master One, Time Bandit and Menu Plus.

### Issue 13.

Includes: Omnimon and Ultimon compared; are they really the same? In-depth review of Super 3D Plotter II. Data compression technique for adventurers. Graphics 8 page-flip program. Megamax C and Lattice C evaluated. Tempering the sound on your 8-bit Atari. Cracking the Code discusses player/missile graphics. Demon, the Baron's horrific creation is after you! 8-bit reviews include Planetarium, Price of Magic, Last V8 and Nuclear Nick. ST reviews include Cornerman, Cards and Major Motion.



# ATARI ST

## Power Without The Price!

### 520ST PACKAGES

The 520ST-M keyboard costs only £346.96 (+VAT-£399) and includes an RF modulator and cable, allowing you to connect it to an ordinary domestic TV set. The keyboard is supplied with 512K RAM, a mouse and a free set of 3 1/2" disks containing applications software. For a limited period from August 11th 1986, we have some special packs offering combinations of the 520ST-M keyboard with a 1/2 Mbyte SF354 Atari disk drive and an Atari monitor (either the Mono SM124, or Colour CM36512). These packages offer up to £200 extra discount on a system. If purchased from Silica, they also come with our free ST STARTER KIT. All of the pack prices shown in the chart include VAT.

### UPGRADE TO 1024K RAM

We are pleased to be able to offer a 1Mbyte upgrade on the standard 520ST keyboard to increase the memory from 512K to a massive 1024K. (It has a full 1 year warranty and is available from Silica at an additional retail price of only £86.96 (+VAT-£100). Any of the five packs can be upgraded to 1Mbyte for only £100. The 1Mbyte ST offers a low price alternative to the 1040, but also gives you the benefit of an RF modulator (not normally fitted on the 1040).

£100 DISCOUNT 1 DISK DRIVE	ALL PACK PRICES INCLUDE VAT	PACK 1	
		Keyboard	Disk Drive
£150 DISCOUNT 2 DISK DRIVES + MONITOR	PACK 2 (MONO)	Keyboard	£399
		Disk Drive	£149
		Disk Drive	£149
		Normal Price	£299
£200 DISCOUNT 2 DISK DRIVES + MONITOR + PRINTER	PACK 4 (MONO)	Keyboard	£399
		Disk Drive	£149
		Disk Drive	£149
		Normal Price	£599
	PACK 3 (COLOUR)	Keyboard	£399
		Disk Drive	£149
		Disk Drive	£149
		Normal Price	£599
	PACK 5 (COLOUR)	Keyboard	£399
		Disk Drive	£149
		Disk Drive	£149
		Normal Price	£599

### REDUCED PRICES

Atari's ST personal computers are now firmly established both in the USA and Europe. The main attraction of the ST range is the value for money which these computers represent, giving both private and business users a powerful asset at a very modest price. There are now several ST packages available from Silica at a reduced price, further enhancing the Atari 'Value for Money' reputation. In addition, we are giving away a FREE Silica 'ST STARTER KIT' with every 520 or 1040 ST purchased at Silica Shop. These offers will only be available for a limited period and commence on 11/8/86.

### POWER FOR BUSINESS

The list below shows some of the new business products which have been recently launched for the Atari ST range. It gives an indication of the ST's potential to business buyers looking to install a powerful, low-cost system.

**CP/M EMULATOR**  
**20Mbyte HARD DISK**  
**LOTUS 123™ CLONE**  
**dBASE III CLONE**

**IBM COMPATIBILITY**  
**VT100 EMULATOR**  
**MICROSOFT WRITE**  
**dBASE II**

Any ST computer will provide its user with a very powerful asset, utilising a vast range of applications, particularly in the business world. Many software companies have been quick to recognise it for its business potential, and have produced programs for the ST which harness this potential. In addition, there are several peripheral and hardware products becoming available to add to the ST's 'Power For Business'. Software now available includes dBase, a dBase III clone as well as H&D Base, a dBase II clone. In fact, First Software have now launched Ashton Tate's original dBase II program for the ST. In addition, PC Intercomm is a VT100 emulator which enables you to use any ST keyboard as a terminal connected to a mainframe or mini. Other programs include a powerful accounts package by Cashlink and a Lotus 1-2-3™ clone called VIP Professional. Microsoft have announced that their powerful word processor 'Microsoft Write' will soon be available for the ST. Many packages are available for very specific market applications including a powerful CAD (Computer Aided Design) program called Easy Draw from Migraph. In addition, there is an engineering tool called PC Board Designer by Abacus Software which will enable the user to design printed circuit boards. For further details of how the ST can help in your business, return the coupon below. We will be pleased to send you our latest newsletter and price list.

### PRICE MATCH PROMISE

We hope you will find that the combination of our low prices, FREE delivery service, FREE Starter Kit and after sales support, will be enough to make you buy your Atari equipment from Silica Shop. If however, there is something you wish to purchase, and you find one of our competitors offering it at a lower price, please contact Owen Pascoe (Office Manager), or one of the sales staff in our sales department. When you telephone us, please provide us with our competitors name, address and telephone number. Providing our competitor has the goods in stock, we promise to match his offer (on a 'same product - same price basis') and still provide you with our normal free delivery. You will also be entitled to our full after sales service, including free newsletters and technical helpline support. We don't want you to go anywhere else for your Atari products. So shop at Silica, the U.K.'s undisputed No1 Atari specialist.

### FREE SOFTWARE

When you buy a 520 or 1040 ST computer keyboard from Silica Shop, you will receive a large and varied software package free of charge. This package consists of twelve programs. Whenever you purchase your Atari ST computer, you should receive the first six software titles as standard. However, if you purchase your ST from Silica, you will also receive a further six extra titles, giving you a total of twelve. All ST's now have TOS/GEM already installed on ROM, so the list of free software you should receive is as follows:

- 1) GEM - DR Desktop environment with WIMP (fitted in ROM)
- 2) TOS - Tramiel Operating System (fitted in ROM)
- 3) 1st WORD - Word Processor by GST using GEM
- 4) BASIC - Personal Basic by DR (with manual)
- 5) LOGO - Logo language by DR (with manual)
- 6) NEOCHROME - A powerful colour paint and graphics package (only useable with colour systems)
- 7) MEGARIGIDS - Asteroids type game by Megamax
- 8) DOODLE - Simple paint/doodle drawing package (works on mono or colour systems)
- 9) CP/M EMULATOR - Allows use of DR's 286 CP/M software to run on the ST range
- 10) CP/M UTILITIES - Various utilities to use with CP/M
- 11) DEMONSTRATION & PUBLIC DOMAIN SOFTWARE - Various games, demos and accessories
- 12) CARDS - A unique set of card games from Microdeal

These additional free software titles are all part of the FREE Silica 'ST STARTER KIT'. Return the coupon below for further details.

### FOUR FREE MANUALS

In addition to the free software which will be given to you when you buy your ST from Silica, you will receive four free manuals:

- 1) ST OWNERS MANUAL (80 pages): Easy access to the information you require to unpack, set-up and become familiar with the ST.
- 2) ST BASIC SOURCE BOOK & TUTORIAL (240 pages): Gives you the information to increase your level of programming expertise.
- 3) ATARI LOGO SOURCE BOOK (77 pages): A source book for Logo, showing how to use the language in the GEM environment.
- 4) 1st WORD MANUAL (48 pages): Instructions for 1st Word.

### ST NEWSLETTER

8 PAGES OF INFORMATION  
TO HELP YOU TO DECIDE  
RETURN THE COUPON FOR A FREE COPY

### 1040ST-F

For the businessman and the more serious home user, there is the 1040ST-F, with 1024K RAM. This can be used in a business environment as a stand-alone system, or can support a mainframe computer as a terminal. The 1040ST-F keyboard with integral 1Mto disk drive costs only £699 (+VAT-£803.85). As the 1040ST-F was manufactured solely with business use in mind, it does not come with an RF modulator for use with a domestic TV. Instead, it requires a monitor. There are three Atari monitors available and the prices for the 1040 with these monitors are as follows:

- 1040 Keyboard without Monitor - £699 (+VAT-£803.85)
- 1040 Keyboard + High res mono monitor - £799 (+VAT-£918.85)
- 1040 Keyboard + Low res colour monitor - £899 (+VAT-£1033.85)
- 1040 Keyboard + Med res colour monitor - £999 (+VAT-£1148.85)

The 1040ST-F includes 1Mbyte of RAM as well as a 1Mbyte double sided disk drive and mains transformer, both built into the keyboard to give a compact and stylish unit, with only one mains lead. The 1040ST-F is supplied with a set of software disks as well as our own FREE Silica 'ST STARTER KIT'. Call into your nearest branch of Silica Shop for a demonstration.

1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX  
117 Orpington High Street, Orpington, Kent, BR6 9LG  
Lion House (1st floor), 227 Tottenham Court Rd, London, W1  
Selfridges (1st floor), Oxford Street, London, W1A 1AB

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If you would like to be registered on our mailing list as an Atari computer owner, or as a person interested in buying an Atari machine, let us know. We will be pleased to keep you up to date with new Atari developments free of charge. So, return the coupon today and begin experiencing a specialist Atari service that is second to none.

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To: Silica Shop Ltd, Dept ATCOC 1086, 1-4 The Mews, Hatherley Road, Sidcup, Kent, DA14 4DX

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Mr/Mrs/Ms: ..... Initials: ..... Surname: .....

Address: .....

Postcode: .....

Do you already own a computer  
If so, which one do you own? .....



# STIMULATION

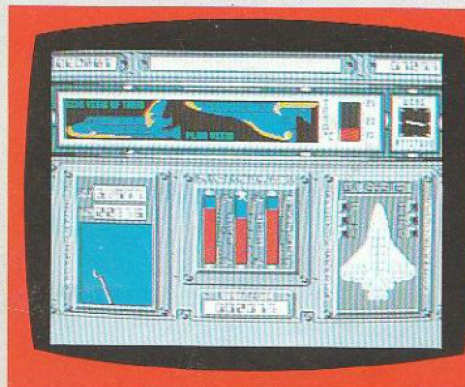
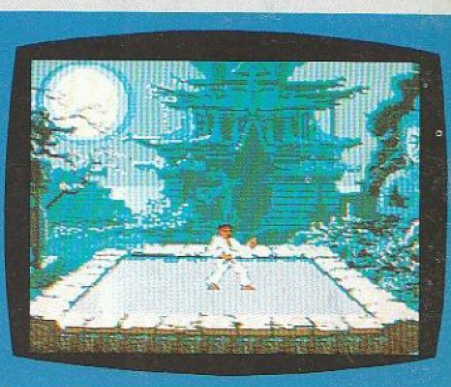
FROM THE WORLDS LARGEST **ST** PUBLISHERS

## KARATE KID PART II - THE COMPUTER GAME

This is not just another Karate game. This is the game of the film. Guide Daniel through fight after fight against ever more powerful adversaries. Then face the evil Chozen himself in the Castle of King Shohashi, where you must discover the secret of the drum - or die! But the fighting isn't all. Catch flies with chopsticks and break ice with your bare hand in full-size, animated graphic screens. Daniel LaRusso faced the challenge. The boy became a man. The man became a hero. What will you do? AVAILABLE LATE

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**STUPENDOUS**



## SHUTTLE II

A whole Shuttle mission experience from your armchair at home. It's the 1990's and a new look Shuttle can take off from any location and fly with the minimum of controls. Are you the next Shuttle II Commander? First take the role of Mission Controller deciding the launch and landing positions and timings, then take the seat of Flight Commander... 5, 4, 3, 2, 1 ignition on... liftoff, now take Shuttle II into orbit ejecting the external tanks. Now on to the Satellite that needs retrieving. On with your jet pack and bring it back into the cargo bay. Now take Shuttle II down, flying through an s-turn - can you stop Shuttle II burning up? Once back into the atmosphere glide gently down until the runway appears in view. Can you land Shuttle II without ploughing it 20 feet down into the runway? Does your score get you into the ratings as one of the worlds best Shuttle II flyers? Find out now by playing the ultimate simulation game... Shuttle II. AVAILABLE NOVEMBER - £24.95\* colour only.

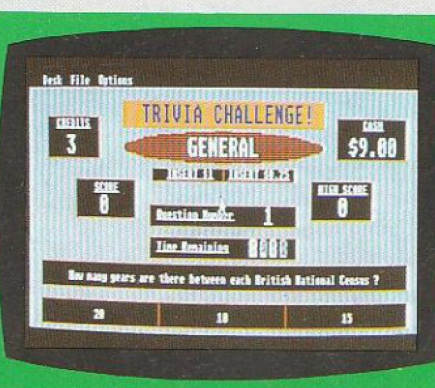
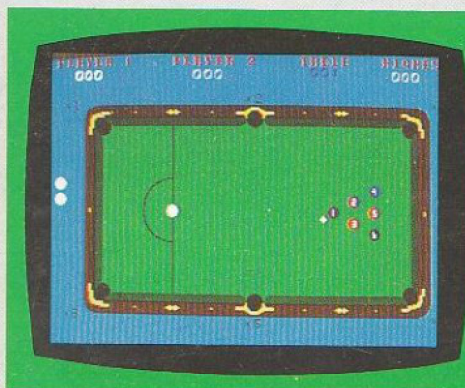
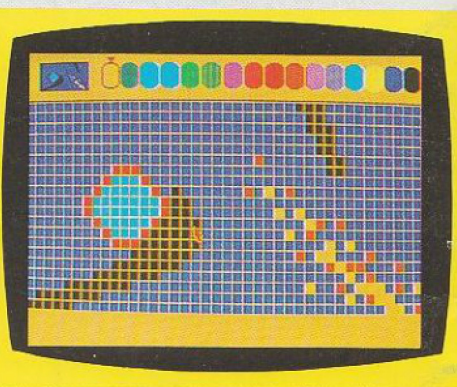
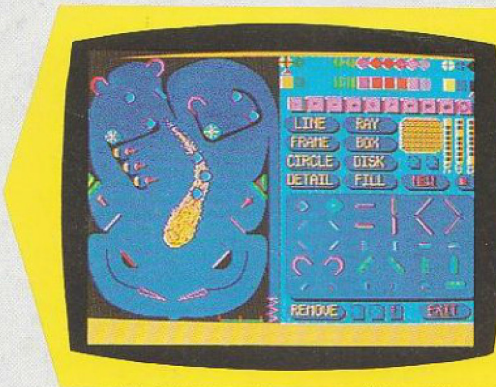
## STAGGERING

## PINBALL FACTORY

PINBALL comes to life with this new arcade game. PINBALL has never been so realistic or so creative. First join the staff of the Pinball Factory - take an empty play area and design the background graphics choosing colours that the ball won't bounce off - the art package will let you design each screen pixel if you want that sort of definition. Next design your own playing board with 30 different bumpers and ball traps to position it's no easy task. Now test the game and change the design to improve the play, are you satisfied with the play area? then switch to the Logo design department, here you can design your own logo with the full art package included in the program. All finished? not yet! set the scoring, gravity, ball speed and elasticity then play the best game of Pinball you've ever played! crisp graphics, sound and fast action. Mouse controls let you 'bump' the machine just like a real pinball machine and 'Flip' the flippers. Now remember to save your customized game to disk. You can decide what's more fun - designing or playing?

AVAILABLE NOW - £24.95\* colour only.

**STUNNING**



## ELECTRONIC POOL

A highly colourful Video Pool game (just like the arcade version), featuring a high score table, 1 or 2 player options with realistic sound effects plus rag-time music. Judge speed and distance, adjust your direction and fire your cue ball, the smooth action is so realistic you don't need to leave home for anything but the beer! Features unique Fun Game Option, try keys F2-F10 anything can happen - all we guarantee is the surprise hidden under each key. AVAILABLE NOW - £19.95\* mono or colour.

## STRIKING

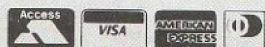
## TRIVIA CHALLENGE

Here are nearly 4000 full length questions ranging from the Bizarre to the educational on International Sport, The Arts, Pop Music, Science and Technology and General Knowledge. This game has been designed along the lines of the successful gambling games which have taken the pubs and arcades by storm. You can even put in your own questions and answers. Here's your chance to enjoy hours of interest, days of frustration and weeks of entertainment. TRIVIA CHALLENGE - the game which allows you to be contestant, gambler and quizmaster and walk away with a crock of gold.

AVAILABLE NOW - £19.95\* mono or colour.

## STUPEFYING

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