



SAM *Revival*

This short sampler issue features some random pages taken from issues 1 to 10 of Sam Revival. The extracts are as follows:

From Issue 1 ...

Page 3 - "Total Immersion Sound Worlds" - an article about advanced environmental surround sound for the Quazar Surround soundcard.

Page 4 - "Stratosphere Tips And Tactics" - from the hints and tips section.

From Issue 2 ...

Page 5 - "Making the World Atom HD Friendly" - a regular series covering patching programs to run from the Atom Hard Disk system.

Page 6 - "What Happened To... Impostors II" - an interview with Stephen McGreal (from Mungus Software) asking about an unfinished Sam game.

From Issue 3 ...

Page 7 - "Sam In A Can" - a look at one of my own Sam's, fitted into a new case, along with a lot of extra hardware.

From Issue 4 ...

Page 8 - "SID on Sam" - an indepth look at the SID soundchip (from the Commodore 64) for use with the new 'SID Interface' for the Sam Coupé.

From Issue 5 ...

Page 9 - "B-DOS - Using A CD ROM" - part of a long running series about B-DOS and the Atom HD interface - this part looks at using a CD ROM drive on the Sam.

From Issue 6 ...

Page 10 - "Quazar's Secret Files" - a look at some of the projects I started myself but never quite finished - in this case a look at my 'Shufflepuck' game.

Page 11 - "An Interview With... Colin Jordan" - a mammoth interview with Colin Jordan who worked at SamCo and wrote several Sam games and utilities.

From Issue 7 ...

Page 12 - "Mode 1 Contention" - an article describing the ASIC generated slowdown in graphics MODE 1 to aid ZX Spectrum emulation.

Page 13 - "Manic Miner Walkthrough" - a regular series looking at Manic Miner.

From Issue 8 ...

Page 14 - "Sam Scene Roundup" - A roundup feature on recent Sam news and events.

Page 15 - "The Forgotten Artifacts of Sam" - a new series looking at old pieces of Sam hardware and software that were only briefly available and not well known about.

From Issue 9 ...

Page 16 - "An Interview With... Matt Round" - Going through Matt's old games on the Sam.

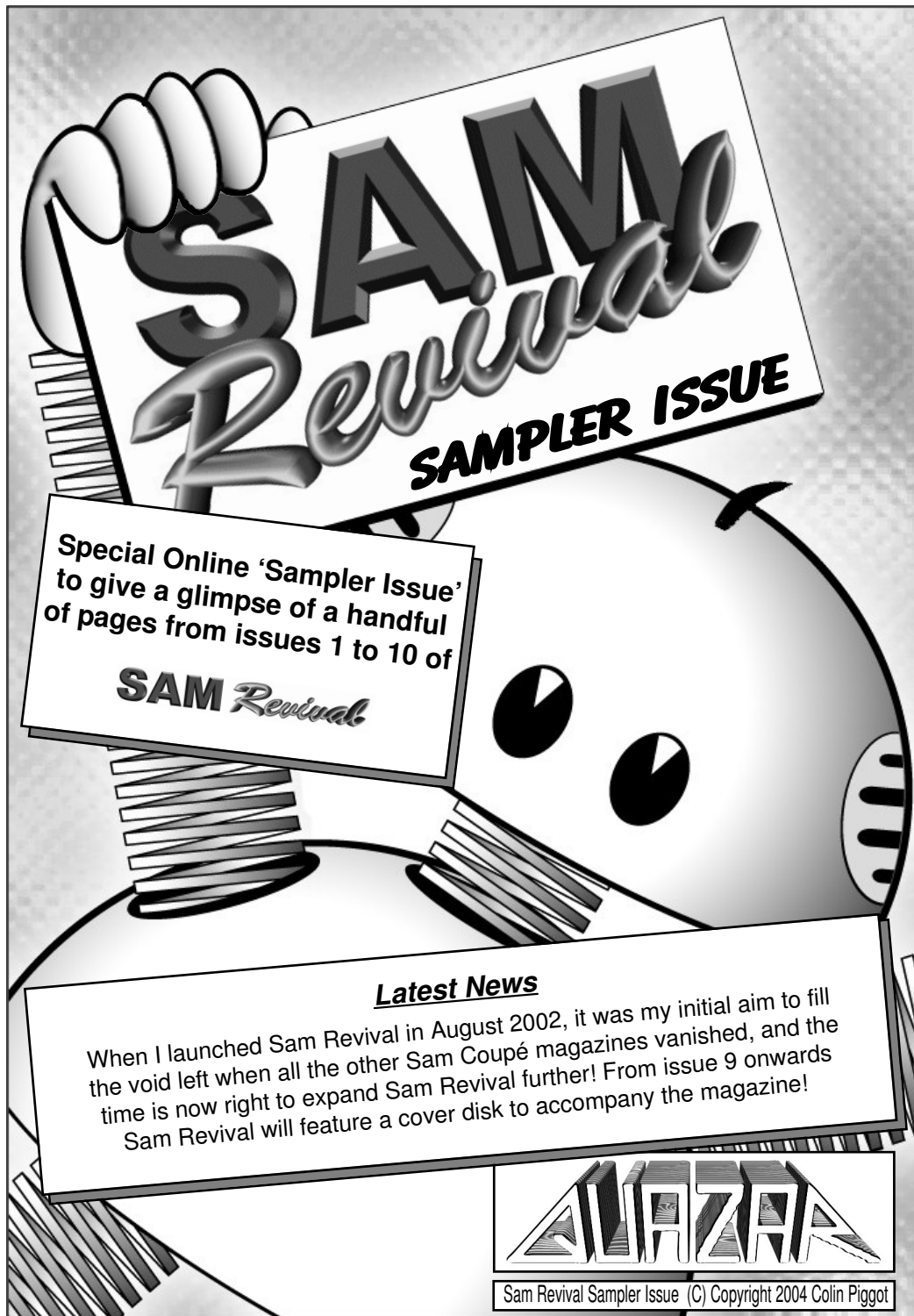
From Issue 10 ...

Page 17 - "PacMan Emulator" - Simon Owen's indepth look at how he wrote an emulator to let the Sam emulate the PacMan arcade machine.

Page 18 - "On the Coverdisk" - a look at the exclusive game on the disk with issue 10.

I hope these short extracts from the first ten issues of Sam Revival give you an insight into what Sam Revival is like, and perhaps you may wish to order the back issues to read the full articles from which these pages have been taken. The full contents of each issue can be found on the Quazar website at <http://www.quazar.clara.net/> and to order any issues I can accept payment online either through PayPal or NoChex, or Cheque by post. To place an order please email me at quazar@clara.net

Colin Piggot



Latest News

When I launched Sam Revival in August 2002, it was my initial aim to fill the void left when all the other Sam Coupé magazines vanished, and the time is now right to expand Sam Revival further! From issue 9 onwards Sam Revival will feature a cover disk to accompany the magazine!



Sam Revival Sampler Issue (C) Copyright 2004 Colin Piggot



By altering the amount of volume reduction, different materials can be simulated, for example, wood would not quieten the sound as much as a solid brick wall, just an example, but you get the idea!

The second TISW demo on Soundbyte 59 showed object occlusion effects - footsteps walking around you, fading as they pass behind pillars, and completely fade away when they enter another room, as well as adding sound effects for when doors open and close for added realism!

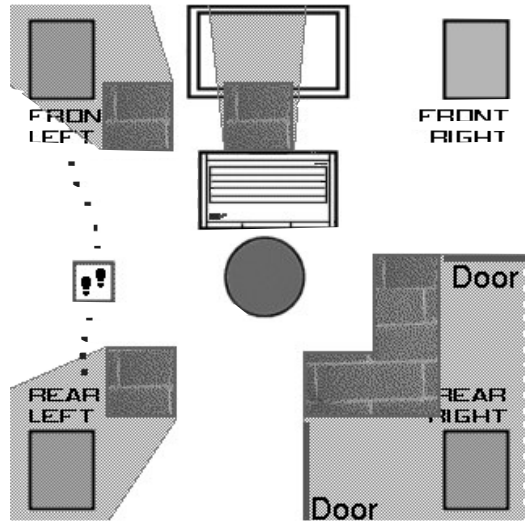


Figure 6 - The sound world used for the 'Occlusion' demo on Soundbyte 59.

What else is planned for Total Immersion Sound worlds? I'll probably be adding more effects as soon as I think of them! A few demos and games are planned for future issues of Soundbyte. Already there has been a sequel to Mouse Hunt - the originally titled 'Mouse Hunt 2' which featured on issue 62 of Soundbyte. This used the distance fading to give the mouse a larger area to run around in, as well as being a second sound source which was a cat which would hinder you trying to catch the mouse as it would scare it away.

Also planned is a large sound world to walk around in - using both distance fading and occlusion effects. As you walk around the virtual sound world, sounds will come and go as you walk around - one idea being the countryside using sound samples of various animals, a stream perhaps, and even what you are walking on - such as a gravel path, all given positions and as you walk around they fade in, grow louder as you approach and then move and fade into the distance as you walk away, as well as being able to walk inside buildings which will then apply the occlusion effect to any sounds that are coming from outside such as the farmyard animals.



The Game - Run or Fight?

Run or fight... good question!

That's the two most common tactics for playing the game. If you choose to 'run' then customise a fast craft, and zoom around cyberspace collecting the flags and hopefully outrunning all the enemies. Okay for the first few levels, but as you progress through cyberspace it'll get harder as the faster and more shielded cybercraft are encountered.

Or if your a good shot, charge in with high shields and ammo and blast your way to the flags, but remember not to ram raid the enemy as you'll shields won't last long if you collide.

Both effective tactics... you'll see between levels if you are better at avoiding or hitting enemy craft.



Killed by an Armoured Cyber Craft - perhaps running wasn't a good idea!

What's my own tactics? Drive Backwards - it's simple but effective! Steer towards the flags while driving backwards, shooting at the enemies as they chase behind you, it's quite effective for the first few levels - then as they become faster and have more shielding your ammo will be used up quite quickly, and you'll be swerving quite a bit to avoid their missiles.

Other general tactics:

Hyperspace - Never forget about hyperspace! Activate it when your shields have gone and get to a recharge pod as soon as you can, remember it will take a good few minutes for it to recharge so don't go back into battle right away.

The Scanner - Easy enough to glance at for seeing where flags and recharge pods are, but



The first change is to see if BDOS is installed, if it isn't then we want to use the code above, so first renumber line 350 to 351. Line 350 now wants to become a test for BDOS, this is testing DVAR 7 for being >= 20, if it is installed, DVAR 7 is < 20. (See figure 2)

```
350 IF PEEK DVAR 7 >= 20
351 CLS : INPUT "New Device :"; LINE a$; POKE SVAR 6,
      CODE a$(1) BAND 223, VAL a$(2 TO ) : GO TO 40
352 END IF
```

Figure 2: The lines to check for BDOS

If BDOS was installed then the flow will fall through to the line after 352, this is where we want to start our new code. First off we want to clear the screen and, to make things easier, display a list of the records available. To do this we simply do a CLS, and then a RECORD command. After this we want to prompt the user as before, but this time we would also accept a record. (See figure 3)

```
353 CLS : RECORD : INPUT "New device or record :"; LINE
      a$
```

Figure 3: Asking for the record

The user may have entered a device, 'D1 ' or 'D2', rather than a record; if this is the case then we need to use the original poke command. (See figure 4)

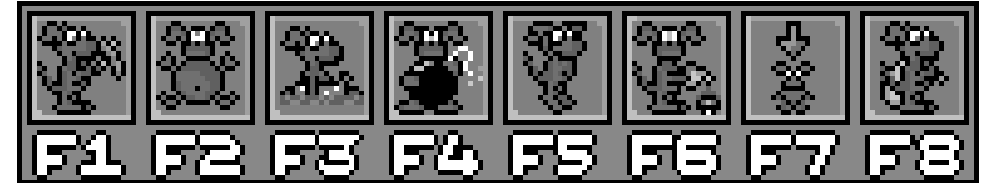
```
354 IF a$ = "d1" OR a$ = "D1" OR a$ = "d2" OR a$ = "D2"
355 POKE SVAR 6, CODE a$(1) BAND 223, VAL a$(2 TO ) : GOTO
      40
356 END IF
```

Figure 4: Checking for a device rather than a record

This check can be improved if you so wish, it is also where you can add any code to allow you to use the tape device as well. If the flow goes beyond this line then the user is wishing to select a new record. Although this is a simple RECORD a\$ line there is another thing that must be taken into account, the current device may not be D2. To solve this we simply need to change the device back. (See figure 5)



The work in progress code consists of a six screen level which you are able to play through, although with just placeholder graphics for the scenery, but it is fully working - complete with switches, ladders, water and killer objects. The number of Imps you control has increased to eight, and can be switched between easily by using the function keys instead of cycling through them all in the original. A few of the familiar Imp types remain, and some new ones.



Easier selection of the Imp you want to control.

Can you tell us about the Imp abilities that were going to be in Impostors II?

Stephen: "Yup, we kept the pickaxe, floater, and the gardener from the original because they worked well. I was never so happy with the kamikaze and the magic wand guy so we ditched them and thought of some new ones. We had a swimmer with a rubber ring and one who could climb along ceilings because we figured that with the flip-screen level design we wanted lots of ways to travel. The shrinker was similar because he could get through small spaces but I think we were going to use him for something else, maybe because he was faster or harder for the bad guys to spot - I forget. The one with the bomb I think was originally Nicholas's re-design of the kamikaze imp but I think we were going to have him throw bombs to destroy scenery and bad guys as well. The one with the sack would have an inventory (either one or three items, I don't think we'd decided yet) and could pick stuff up and use it elsewhere - basically it was going to be like having Dizzy helping out, opening doors with keys etc. I was always a big fan of Dizzy anyway and it seemed that the type of game we wanted to make would suit this skill."



On the left, a normal Imp,



On the right, the new Imp with a bag for carrying items.

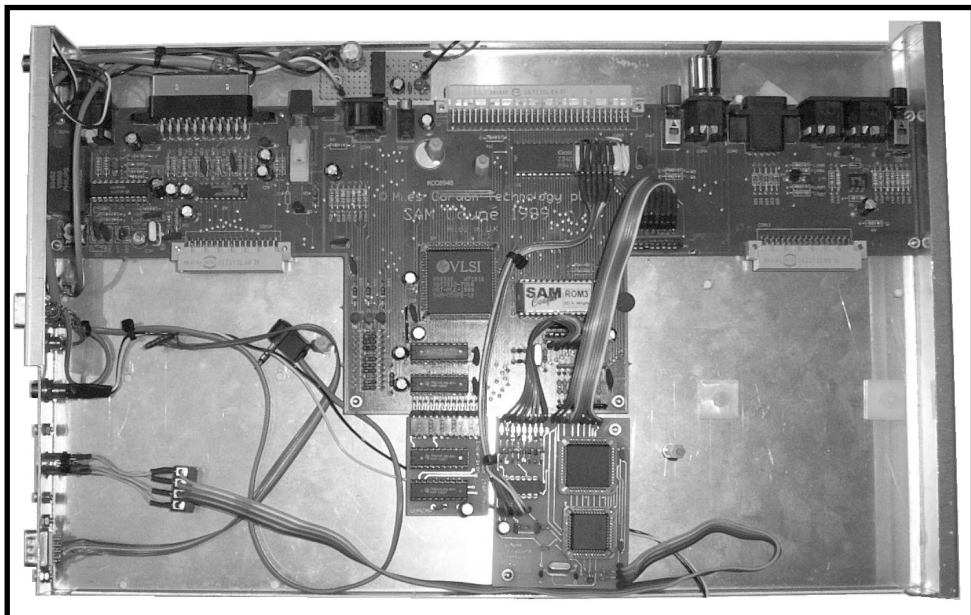


Looking Inside In Detail

On the left is a photo showing the full insides of the Sam In A Can, but lets start here with a breakdown of the insides.

I've fitted the Sam motherboard to the bottom of the case, on some very short spacers. No modifications have been made to the motherboard apart from the 3 connectors that are required for the PC Keyboard interface. By using the PC Keyboard interface it avoids the troublesome task of having to mount an original Sam keyboard on top of the case where it would be quite easy to damage, or adding cables to attach to the fragile ribbon cables on the membrane. The keyboard interface also allows RESET and NMI to be triggered from the PC keyboard to save having to wire in and mount extra switches for those.

The motherboard is fitted about an inch from the back of the case, this allows access internally to all the ports and leave enough room for the cables to be routed around inside the case. In the photo below you can see the cabling from the SCART socket to the Composite video and RGB connectors on the side. Attached to the motherboard is a normal 256K memory upgrade to give the standard 512K, and next to that is the PC Keyboard interface, which connects to the motherboard by three sets of cables. I've used a chassis mount ps/2 socket to plug the keyboard into and this connects to the keyboard interface with screw terminals just like the usual external blue pods I build for them.

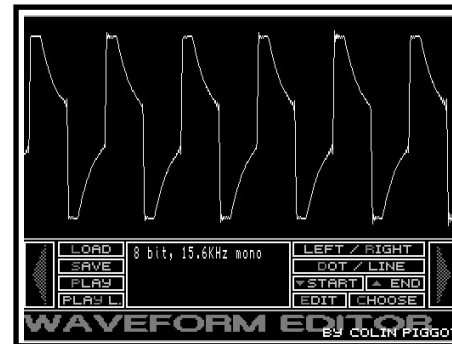


A half-empty view of the Sam In A Can shows the Sam motherboard fitted to the base of the case, along with the PC Keyboard interface, a small power supply PCB and a lot of cabling for the various connectors on the side of the case.



Now is a good time to sample the output audio from the SID chip to have a look at the waveform shapes compared to the audio of the SAA1099.

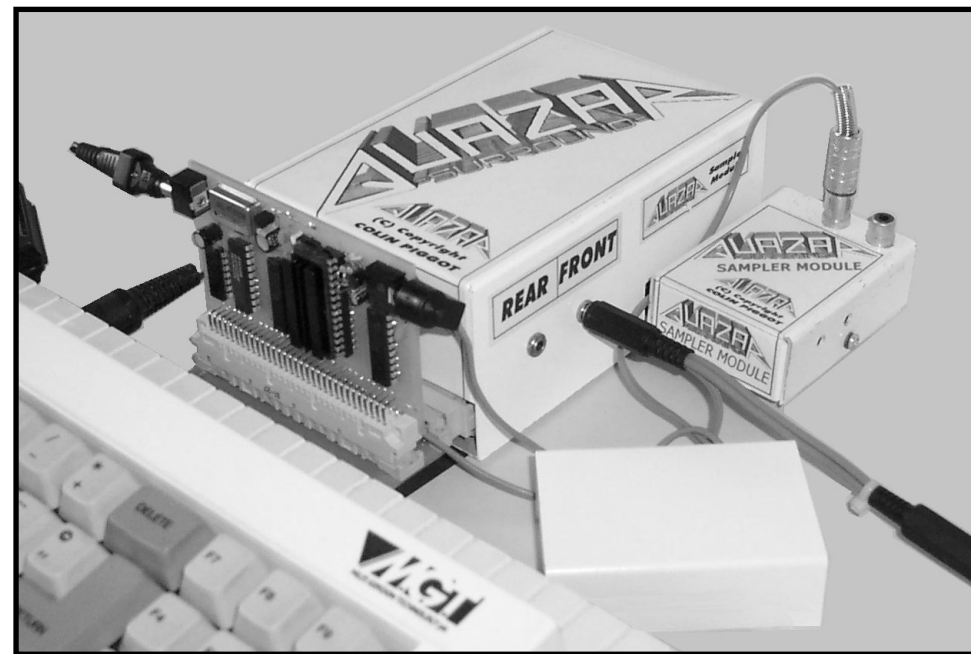
To look at the waveforms I linked the audio output of the SID Interface through a small audio amplifier and fed that signal into the Sampler Module on my Quazar Surround soundcard. I could now OUT a few commands to the SID to make it produce a constant tone, load up the Sampler Module's software and make a recording of the tone. Likewise, I could link the audio out of the Sam to the Sampler Module to record the waveform from the SAA1099.



The sampled output from the Sam's SAA1099

Once recorded, I could view the samples using the waveform editor I had written a long time ago for issue 18 of Soundbyte.

The output from the SAA1099 looks quite crude compared to the relative cleanliness of the three types of wave from the SID, with each of three different waveforms sounding different.



The finished SID Interface linked through a small audio amplifier to the Sampler Module on the Quazar Surround soundcard.



B-DOS - Using A CD-ROM Drive

Article by: *Wolfgang Haller*

The possibility of having a CD-ROM (and a harddisk) connected to your Sam has some superb advantages. But before I will explain what I mean some elementary thoughts.

In the last article I mentioned that connecting one harddisk and a CD-ROM to the Sam has taken me several attempts as there are differences in the ATAPI standards (ATAPI v0, ATAPI v2 or ATAPI v3 if you use a DVD-ROM). And this is a problem - not any CD-ROM will work. So it would be good if you could get a cheap drive to try first. I suppose you'll get the best results with a CD-ROM with ATAPI v2 standard.

In the B-DOS readme done by Martijn Groen and Edwin Blink there are some CD-ROM drives mentioned which work fine with B-DOS. Here is a list of some ATAPI v2 based ones:

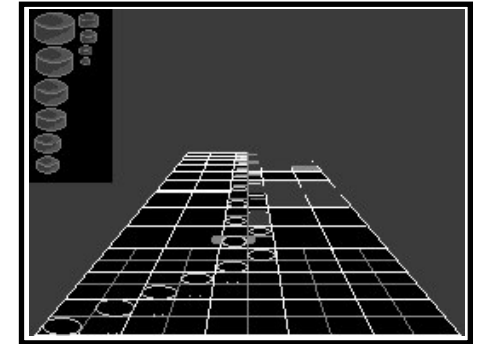
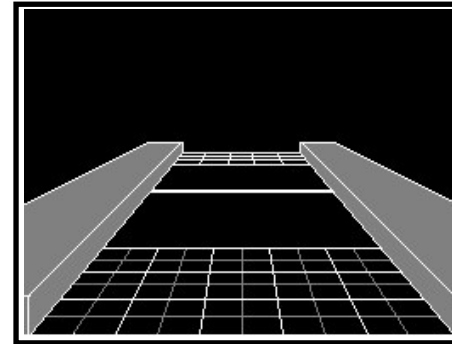
- Funai 8x
- Philips 32x
- Lite-On 32x
- Pioneer 4x
- Matsushita

If some of you readers know others ones, a mention of these are welcome. However, some drives with other ATAPI standards will work as well, including:

- Actima 36x (Atapi v0)
- DVD-ROM (Atapi v3)
- Acer DVD-ROM (Atapi v3)

If you have got a CD-ROM drive connected to your Atom interface then always set the jumper to "SLAVE" before you connect it. Once this is done you are ready to start.

But what can I do with it, I hear you ask? If you are connected to the Internet you can

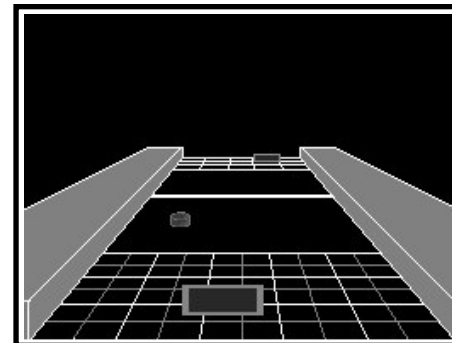


Two development screens from Shufflepuck. The first screen shows the outline graphics for the game table, the second shows me working out the perspective for the puck size depending where it has to be placed on the game board.

much graphics to draw - the first thing that was required was the actual game board which was generated with a small BASIC program to work out the perspective required - I always find BASIC on the Sam fantastic for knocking up small programs to work out maths equations for functions within games! The other graphics were required was the puck. For this I drew it at 10 different sizes to save having to rescale a sprite every time it was drawn on screen. As each puck differs by only 2 pixels width it's sizing would appear quite smooth when drawn on the screen moving up and down the game board.

With the graphics ready, work did start on the actual coding of the game. First I started off with reading the mouse - this after all would have been a mouse only game - experiments with using the keyboard / joystick to move the paddles around proved to be too unresponsive. It wasn't long before the player's paddle was being drawn on the screen and moved around with the mouse, so it was time to add the puck with some simple rules to

control how it bounced around depending on speed, angle and how hard it was hit by the paddles. Drawing graphics with the 3d perspective of the game were handled by using data tables of screen positions with regards to position on the board. Precalculated data tables are a very fast way of avoiding having to do slow mathematical calculations in machine code.

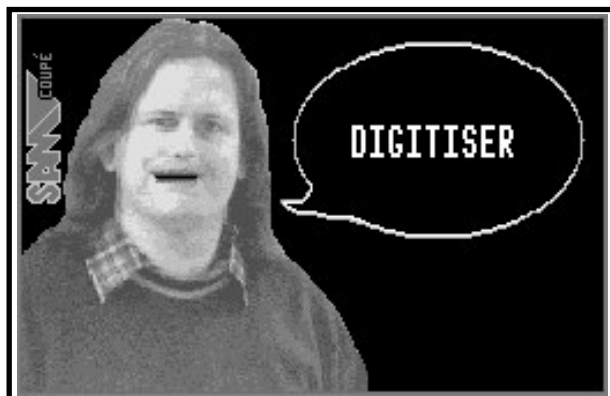


A screenshot from the last build of the code in late 1996. The paddle could be controlled with the mouse, and the puck would realistically bounce around the game board.

So what happened to the game... when it was last worked on, it was in a semi-playable state, with the paddles moving and the puck bouncing around - although no computer controlled opponents. Although Shufflepuck was postponed temporarily while I was working solely on Stratosphere in late 1996 and 1997, I never did start on it again afterwards...



simply did not have the funds to invest in it. I did end up using some of the images generated from it in the demo for the Sam Adventure System."



Colin Jordan's picture was used in the Sam Digitiser Demo on a SamCo newsdisk.

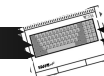
Any interesting stories about the goings on at SamCo during your time there?

Colin Jordan: *"Many. One of my favourite memories is of FRED publisher Colin MacDonald being tied to a chair by masses of sticky tape and being forced to sit with his trousers round his ankles in the middle of a courtyard, overlooked by all the offices in the Swansea Enterprise Park! We were a great place for playing practical jokes on visitors in those days."*

What were your feelings when SamCo later folded?

Colin Jordan: *"The writing had been on the wall for some time, so it was no great surprise really. For months, SamCo had been surviving on a knife edge with each mailshot bringing in just enough money to see them through for another month... On more than one occasion Alan Miles decided to call it a day, only to change his mind and decide to persevere with it. Of course I was as upset and disappointed as much as anyone else. SamCO was a company that I cared a great deal about. In fact Alan used to say I cared TOO much. But once SamCo collapsed, I knew that it was really the end and I had to move onto something else."*

In retrospect, I feel the main problem was that the Sam was launched two years later than it needed in order to have really taken off as it deserved."



MODE 1 CONTENTION

Article by: *Simon Owen*

Introduction

For compatibility with existing Spectrum software, the Sam Coupé shares a number of hardware features with the Spectrum. These include a common video mode (Sam's mode 1) and I/O ports (keyboard, border, attr), allowing most Spectrum software to run unchanged.

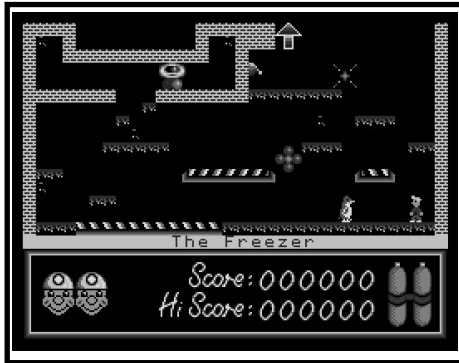
A key difference between the machines is that of CPU speed: the original Spectrum has a 3.5MHz Z80A, and the Sam a faster 6MHz Z80B. This speed difference could easily break timing sensitive code, causing problems such as unexpected interrupt re-entrancy. For this reason, the Sam was designed to run at a reduced speed in mode 1. The Sam technical manual doesn't cover the speed reduction, so a test was needed to determine exactly where the delays occurred. My curiosity was driven by a desire to implement the feature in SimCoupé, which would need a precise understanding of the effect.

The Code

A few quick tests in the upper border area confirmed delays present only in mode 1. By monitoring the timing of code across the display width, it would be possible to determine where the delays were in effect.

The following code fragment is designed to be executed in the border area just above the main screen, positioned using a fixed delay from the frame interrupt:

```
LD DE,&0002 ; 00 = black, 02 = red
LD A,E ; red
; <- nops added here
OUT (254),A ; border red
LD A,D ; black
OUT (254),A ; border black
```



conveyor belt and even controlled the movement of one of the nasties on the screen.

On the Spectrum original Matthew Smith only had the switches controlling if a block existed or not.

The reason the SAM version was able to do this of course, was down to a series of room specific instructions set up for special case rooms such as this. Which meant the rules of the standard blocks could be overridden in the

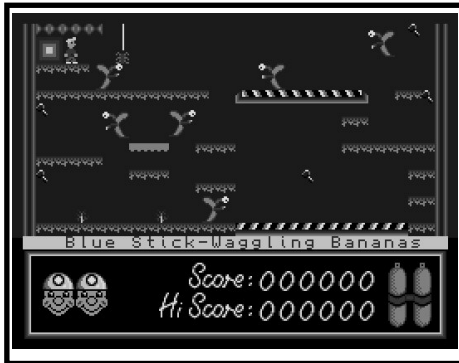
odd case.

The room name was obvious - but it gave us an excuse to bring the penguin back as well.

We played with switches a little more in the game, but this is definitely the best example of them in action.

Tips: Hit the right button, and follow the room round. You will have to go round twice at least to complete the level.

16 - Blue Stick-Wagging Bananas



Blue stick what????

This room started out as a level called "Attack of the hairy hackers" - designed by Richard Swann. (Quite apt as Richard Swann was quite well known in YS as a talented Hacker. Richard also composed some excellent music for the never-completed "Manic Mansions", the Jet Set Willy styled game that Daniel Cannon started coding for me.)

However, as we seemed to have a lack of sprites of "hairy hackers" - it became, in the

hands of Matthew Holt, an excuse to use the strange Blue Stick wielding banana sprites we had.

This is rather a brightly blue coloured room.... I seem to recall designing the orange tube, but the bananas where designed by Brian McConnel.

Tips: Again, timing and careful leaping is the name of the game.



MicroMart Fair - November 30th

The MicroMart Computer Fair took place on the 30th November at the NEC in Birmingham, and I was invited there to show off the Sam Coupé in the 'Retro Zone' feature area, amongst a load of old Commodores, Ataris and old arcade machines as well as one or two ZX Spectrums and QLs. Although the

MicroMart show was mainly for PC Traders, the Retro Zone was always busy with people wondering what these old computers were, as well as those who still use them who came along to see the latest developments.

It was also great to met up again with a handful of Sam owners who came along - so a quick hello to Simon Owen, Geoff



My Sam Coupé setup in the 'Retro Zone' at the MicroMart Computer Fair.



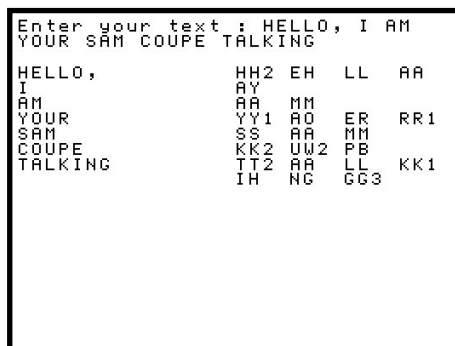
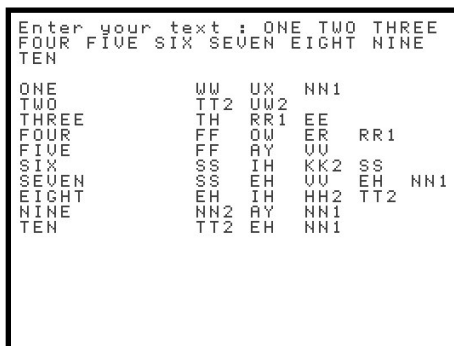
```

670 REM The Letter 'A'
680 REM
690 IF word_len = 1 THEN LET this_one$="20": RETURN
700 IF word$="SQUARE" THEN LET this_one$="07": RETURN
710 IF letter = 1 THEN GO TO 730
720 IF word$(letter-1)="E" THEN LET this_one$ = "": RETURN
730 IF letter = word_len THEN GO TO 820
740 IF letter = word_len-1 THEN GO TO 810
750 IF word$(letter+1) = "U" THEN LET this_one$="23": RETURN
760 IF word$(letter+1)="I" AND word$(letter+2)="R" THEN LET
this_one$ = "47" : RETURN
770 IF letter = 1 THEN LET this_one$="24": RETURN
780 IF word$(word_len-1)="L" AND word$(word_len)="E" THEN LET
this_one$="24": RETURN
790 IF word$(word_len-1)="C" AND word$(word_len)="E" THEN LET
this_one$="24": RETURN
800 IF word$(word_len)="E" THEN LET this_one$ = "20": RETURN
810 IF word$(letter+1)="I" OR word$(letter+1)="Y" THEN LET this_one$
= "20" : RETURN
820 LET this_one$ = "24"
830 RETURN

```

Part of the BASIC Text to Speech program, which deals with choosing the allophone when it encounters an 'A' in the word. (word\$ = the whole word, and letter being the position of the current letter being processed within the word)

the 27th August 1990. The Text to Speech program did quite a reasonable job of translating words into the appropriate allophones, although if something didn't sound quite right it was worth trying to type the word as how it sounds rather than the correct spelling. What is quite useful is that the converted allophones are shown on screen so you know what the Voicebox is playing, but what is lacking is an option to save the converted text for future playback.



Two example screens showing the Text to Speech program, with the converted allophones being shown for each converted word



An Interview With... Matt Round

Continuing on with the series of interviews of Sam personalities, this time I've had the opportunity to fire some questions off to Matt Round, who you may remember from a whole host of GamesMaster games which appeared on Fred magazine in 1993-4 as well as T'n'T which was released commercially by Revelation Software.

Firstly, thanks Matt for your time in doing this interview, and to get the ball rolling it's the most obvious question - when did you first hear about the Sam Coupé and what attracted you to buying one?

Matt Round: "I think I read about it in Crash, when it was held together with a mesh of wires. The Spectrum was getting very old and it seemed like the only hope for a direct successor, so I was one of the optimists who ordered well in advance."

Once you had possession of a Sam, what was your impressions of it's capabilities?

Matt Round: "My reactions were mixed. As a physical object it was beautifully designed, and the new graphics and sound features seemed exciting, but nothing bundled with it showed off its capabilities. The screen of the astronaut on the moon got a few 'oohs' and 'aahs', but nothing else wowed people, and things like having to wait to be able to use the disk drive, having to change the ROM etc. didn't help."



I'm sure we all remember the astronaut screen from the SAMDOS System Disk!

How soon did you start to experiment with programming on the Sam?

Matt Round: "After half an hour or so! Andy Wright did a superb job with the BASIC, it managed to make Spectrum users feel at home without holding the SAM back, it was fast enough and had few bugs."



Implementation

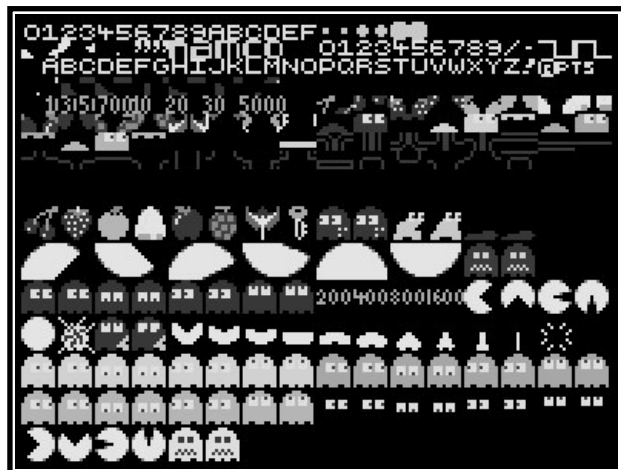
Video

The first problem to tackle is the Sam display being too small to hold the entire arcade image. Fortunately I'd already solved this in my own Pac-Man clone, written back in 1994 (http://homepage.ntlworld.com/simon.owen/sam/pacman/). Using 6x6 pixel cells instead of 8x8 fits the maze to the Sam height almost perfectly. It does mean the two lines at both the top and bottom of the display (used for score and fruit) need to be moved, but since the display is stored as characters this is relatively easy to do.

Scaling down the arcade graphics is the next problem, and my attempts to do automatic scaling gave poor results. Another option is to drop 1/4 of the pixels in both X and Y directions, but a few tests showed that didn't work very well either, particularly when displaying text. I settled on redrawing the graphics by hand, as I did for my old program. I'd need to cover all the arcade sprites shown in the first image above.

Matching colours from the arcade to Sam is relatively easy, with a little help from Paint Shop Pro on the PC. I started with a SimCoupé screenshot from Sam BASIC showing all palette colours, using a simple PALETTE 0,n LINE n loop with values from 1 to 127. This was loaded into PSP to give the full Sam palette, which was then saved to a .pal file. In MAME I saved a screenshot showing as many graphics as possible, to give a wide selection of arcade colours. Finally, I loaded this image into PSP and imported the .pal file to convert the screen to the nearest Sam colours. There were still more than 16 unique colours used, but some were similar enough to share a single Sam colour.

Still in Paint Shop Pro, I drew the full character and sprite sets needed to match the arcade versions. Here's the completed set:



On The Coverdisk

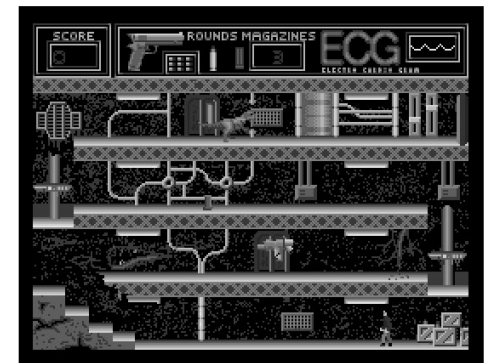
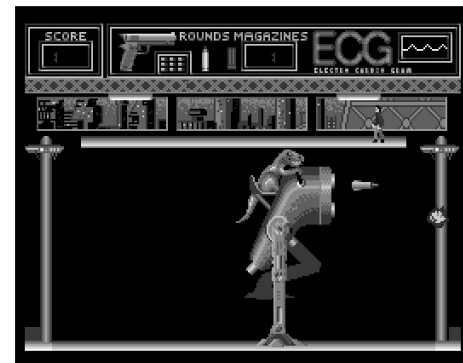
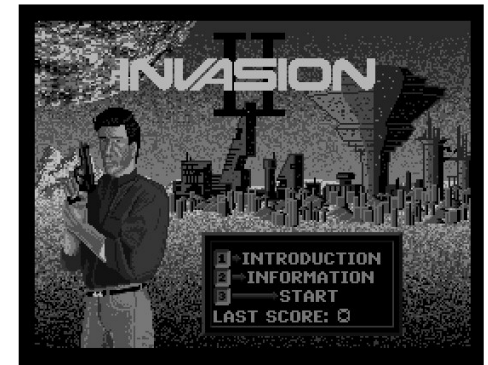
Invasion II - by Warren Lee

An exclusive game on this issue's cover disk - Invasion II, written by Warren Lee. Originally written back in 1996, Invasion II was never published so when I first fired up the game I was rather excited in playing something completely new and unseen and i'm sure you will be too when you load the game.

Apon loading you will be greeted by a menu screen giving you three options:

"Introduction" will show the prologue to the game, and is packed full of animation. "Information" goes over the controls and options in the game, and then when you are ready select "Start" to begin the mission.

An interview with Warren starts over the page...





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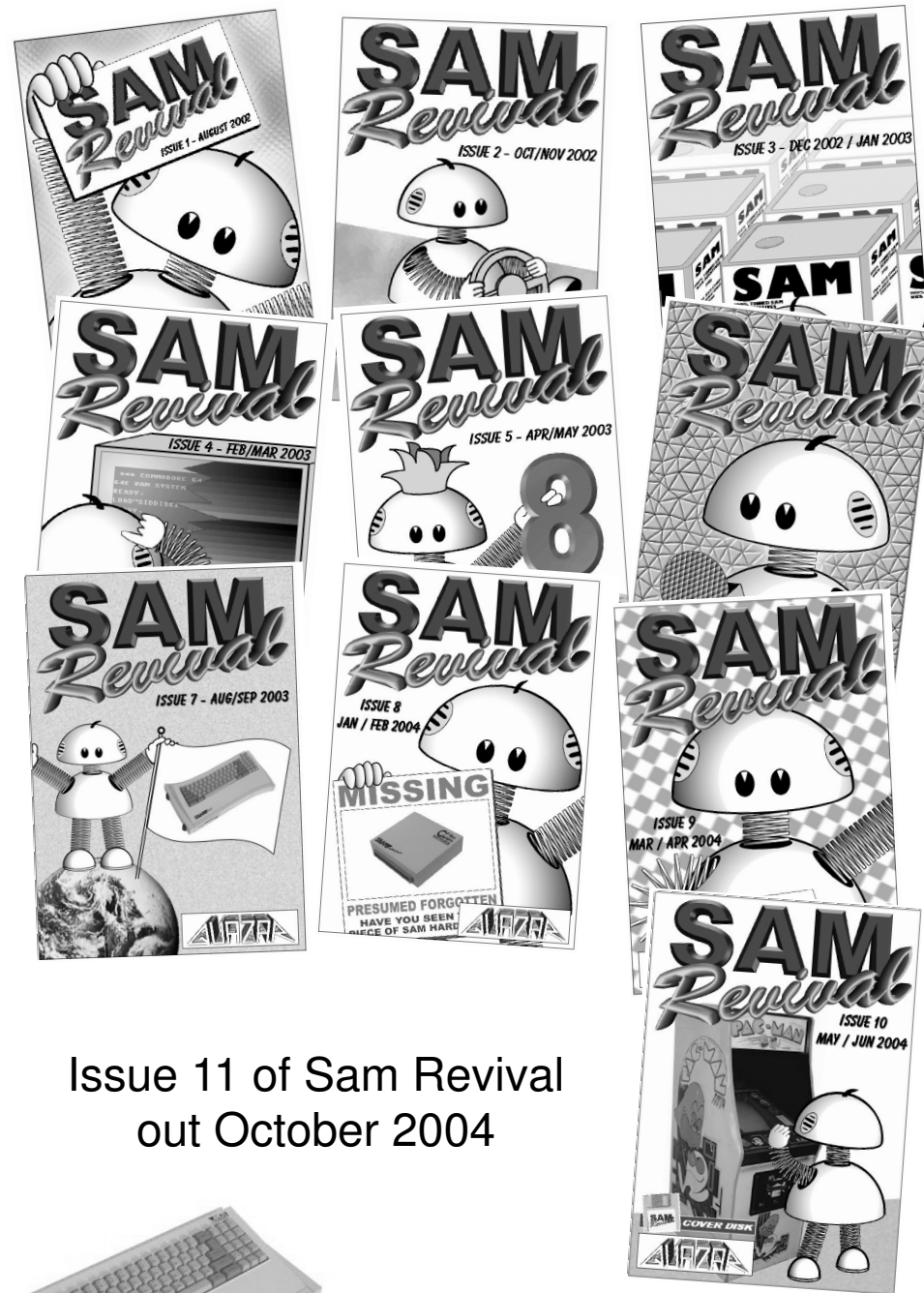
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