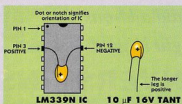


TRAP THAT MOUSE

Does your mouse pointer jump and rush about the screen for no apparent reason? Andrew Marsden from Retford suffered from this, until he developed a solution. To give your mouse a steadfast, stay-where-it's-put feel, simply open up the mouse by removing the two screws underneath and solder "piggyback style" a 10µf (microfarad) 16 volt tantalum capacitor to legs 3 and 12 of the LM339 IC as found in most mice.



The positive lead to the capacitor is clearly marked with a + symbol and is usually the longer of the two. Attach this to pin 3; the other leg goes to pin 12. This is shown in the diagram above. The capacitor must be connected the correct way round and you must make sure that when you attach it you do not accidentally join any of the IC legs together with solder.

You can obtain the capacitors from Maplin Electronics (☎ 0702 554161, order code WW68Y, price 28p), although they are readily available from most TV repair shops.

MAKING MUSIC ON THE STE



Patrick Yates from Lancashire has been busy with his copy of STOS BASIC and has come up with a smart little routine for playing samples through the STE's DMA chip, thus enabling you to take advantage of the STE's stereo sound. The routine is a modification of the BASIC routine supplied in the Mastersound manual, but with a few enhancements to get the best out of the STE's improved design. Here's that routine in full...

```

erase 1
rem ** reserve space for sample in
rem ** bank one
reserve as data 1,N
rem ** n=length of sample
blood "state.sam",1
rem ** get start of sample
SAMPLE = start(1)
rem ** get address of DMA
DMA = $FF8901
rem ** get length of sample
L = length(1)
rem **reset DMA chip
poke DMA,0
rem ** set sample rate and mono mode
rem ** 128 = 6.5 kHz
rem ** 129 = 12.5 kHz
rem ** 130 = 25.6 kHz
rem ** 131 = 51.3 kHz
poke DMA+32,128

```



■ Get a better sound out of your STE with this excellent sample player routine for STOS BASIC

```

rem ** set start and end
poke DMA+2,SAMPLE/$10000
poke DMA+4,SAMPLE/$100
poke DMA+6,SAMPLE and $FF
poke DMA+8,SAMPLE/$10000
poke DMA+10,SAMPLE/$100
poke DMA+12,SAMPLE and $FF
poke DMA+14,(SAMPLE+L)/$10000
poke DMA+16,(SAMPLE+L)/$100
poke DMA+28,(SAMPLE+L) and $FF
rem ** play sample thru DMA
rem ** 1 = normal play
rem ** 3 = continuous play
rem ** 0 = turn off sample
poke DMA,3

```

Reserved memory banks:
1 sprites \$0B8E00-E:\$0BE9C00
L:\$030E00

RUTLAND COMPUTER SUPPLIES LTD

30 Buckminster Close,
Melton Mowbray,
Leics, LE13 1ET.
Collections welcome.
Please ring first.



OFFICE HOURS



9.00am to 7pm Monday to Friday
10.00am to 12 noon Saturdays

PHONE & FAX NO 0664 500878

All prices include 17½ VAT

Post and Packing...£3.50

3 Day Courier£6.50

Overnight£8.00

* **LASER PRODUCTS** *
AVAILABLE

Any orders over £100 are sent
by courier for just £4.50 !
(Published Prices Only)

All orders are despatched
within 24 hours
subject to stock availability

TOP QUALITY UNBRANDED DISKS AT DISCOUNT PRICES

3.5 D5DD Disks inc labels.....39p each	5.25 D5DD Disks.....25p each
3.5 D5DD Coloured Disks inc labels.....45p each	5.25 D5DD Coloured Disks.....39p each
3.5 D5HD Disks inc labels.....99p each	5.25 D5HD Disks.....49p each

All Disks are Guaranteed 100% Error Free

Packed with sleeves, Labels + W/P Tabs

STORAGE BOXES

3.5" BOXES	£	5.25" BOXES	£
40 Capacity.....4.60		50 Capacity.....4.60	
80 Capacity.....5.10		110 Capacity.....5.20	
100 Capacity.....6.10		120 Capacity.....6.50	
120 Capacity.....7.10			

Cables

IBM PC Cables 1.8m Long.....6.15	
Centronics To Centronics Cable 1.8m.....9.50	
2 Meter Joystick Extension Cable.....4.95	
MS222 Male - Male, Female - Female, Male - Female 8.50	
Joystick/Mouse Extension Cable.....3.95	

WE CAN SUPPLY CABLES MADE TO ORDER PLEASE RING FOR A QUOTE

Computer Stationery

Listing Paper 11" x 9.5" 60gsm 2000 sheets.....17.00	
11" x 9.5" 80gsm 2000 sheets.....20.00	
A4 70gsm 2000 sheets.....19.00	

QUALITY COMPATIBLE RIBBONS

ORIGINALS AVAILABLE ON REQUEST

MAKE	GP	1+	5+	MAKE	GP	1+	5+
AMSTRAD LQ3500/8256	2741FN	3.15	2.50	LQ2500	2795DN	4.05	3.20
9512	2746FN	2.90	2.35	LQ2550	2877DN	4.05	3.20
DMP2000/3000	2482FN	2.66	2.10	NEC P2200(+)	2844FN	3.30	2.40
BROTHER M1009	2412FN	3.60	2.85	OLIVETTI DM1/200	2843FN	3.65	3.25
M1509	2479FN	5.00	3.95	DM105	2863FN	4.75	3.35
CANON 1156	2223FN	3.55	2.80	PANASONIC KXP710	2228FN	2.95	2.35
CITIZEN 120	2488FN	3.10	2.45	KXP1124	2904FN	2.95	2.35
CITIZEN SWIFT 24	2939FN	3.90	3.10	KXP1081	2904FN	2.95	2.35
SWIFT 24 COLOUR.....ORIGINAL 17.00..16.00				STAR LC10	2861FN	2.65	2.30
EPSON EX800	2774FN	3.35	2.95	LC10 COLOUR	2861COL	5.00	4.60
FX800/LX800				LC24-10	2866FN	4.10	3.75
MX/FX800	2273FN	2.95	2.35	LC24 10 COLOUR.....ORIGINAL 12.50..11.80			
MX190	2320FN	3.20	2.60	LC200	ORIGINAL	6.40	5.00
LX80/LX86	2454FN	2.15	1.70	LC24 200	ORIGINAL	9.00	8.00
LQ800	2477FN	3.10	2.75	LC24 200 COLOUR.....ORIGINAL 12.50..11.80			
LQ1000/1050/2478DN	3.70	2.90		LC200 COLOUR.....ORIGINAL 12.00..11.00			

THIS IS JUST A SMALL SELECTION OF RIBBONS
IF YOUR PRINTER IS NOT LISTED - PLEASE RING FOR A PRICE

STOS surgery

Screen addresses muddled again? Need a hand untangling your spaghetti code? Visit our surgery – two-year-old copies of *Country Life* not included

STOS is a powerful yet simple version of BASIC which has sold over 120,000 copies on the ST. Ideally suited to producing games, it has many specialist graphics commands. No need to delve into system calls to use interrupt-driven sprites and sound – STOS sets it all up for you. But like all powerful packages, it has its own little quirks. STOS surgery is here to point you in the right direction. If you use STOS and can think of any hints or tips you reckon we ought to know about, just put them on a postcard or sealed down envelope and send it along to us.

UPDATE IT

There was some panic when early versions of STOS were found to be incompatible with the STE. The latest version of STOS (2.6) is now fully compatible with all TOS versions up to the latest 1.62. If you want to distribute your programming tour de force in the Public Domain, then you must use the latest version. Mike Goodman of Goodmans PDL has offered a free update service. Just send a blank disk and an SAE to Goodmans PDL, 16 Conrad Close, Meir Hay Estate, Longton, Stoke-on-Trent, Staffs ST3 1SW. That's rather nice of him, isn't it? He also handles the official STOS Public Domain and Shareware library.

SCROLL ME UP

The scroll command sounds very powerful but can lead to all sorts of problems getting everything moving smoothly. Below is a very simple but smooth screen scroller. It builds up the pic out of sight on a logical screen, before copying it to the actual screen. Type in the listing (the `J` symbol means no line return yet) and lead in to about bank ten. Run it and enter a number – how many pixels the picture scrolls. It runs at about 16 frames a second. If you do everything directly on the physical screen it speeds up to about 25.

```
10 key off : click off : flash off : hide J
on : curs off : mode 0
30 get palette (10) : screen copy 10 to J
back
40 input SPD
50 logic=back
60 def int 0,0,0 to 320,200,0,-SPD
70 for X=0 to 359 step SPD : scroll 1
80 screen copy 10,0,X,320,X+SPD to J
logic,0,200-SPD
90 screen copy logic to physic : wait J
vbl : next X
100 default logic=logic
```

STE EXTENSION

One of the beauties of STOS is that it's expandable – extra commands and functions can be added as extensions. STOS comes with the screen compiler as standard. Mandarin also produce STOS Maestro, which handles sampled sounds. STE owners have



● With the STOS sprite editor, you can position the hot spot – the point the sprite coordinates are set from – anywhere within the sprite by using the pre-sets on the left or clicking on the sprite. As default, the hot spot is at the top left corner.

been a bit left out – until now! ST FORMAT have got hold of two extensions which enable you to get at the extra colours, hardware scrolling, DMA chip and the bittier. Look out for the full interpreter and compiler versions on the front of next month's *Wolfschorsch* ST FORMAT. (Turn to page 142 for details of how to guarantee your copy.)



SCRAMBLED SCREENS

STOS uses three separate screens – physical, logical and back. It's easy to lose track of what's being drawn on which screen and which one is being displayed. The physical screen is the one you can actually see. The logical screen is where your ST sets all the graphics and text. As default, STOS sets up the physical and logical screen at the same address, so everything you draw is immediately visible. In order to get rid of synchronisation problems, you can define the logical screen as the background screen or one of the memory banks, and copy swap it to the physical screen when all the drawing is finished. The background screen is a copy of the physical screen without any of the sprites on it. It's used to fill in areas of screen that sprites have moved over. Otherwise, they'd leave black trails behind them.

SHIFTY COLOURS

The manual says that the shift command cycles the palette through all 512 colours. Don't believe it. It actually cycles the palette in the same way as art packages do. That is, each colour runs through the 16 possible ones from your current palette. You can set the speed and starting colour. For really complex colour cycling, the flash command is more flexible.

SPEED IT UP

If your program doesn't use sprites and is in need of a boost, try the `autoback off` command. STOS automatically copies graphics to the background screen, which is used as the background for the sprites. All this takes time. If you have no sprites bouncing around – and that includes the mouse – or

if you're using a screen-flipping routine with a logical screen, then turning off `autoback` speeds everything up. The `CLS` or the `mode` command turns `autoback` on again.

TOO TIGHT

Running out of memory? Always boot STOS from an AUTO folder, which bypasses GEM and saves you about 32K. Still not enough? If you don't need the compiler or want to use floating point numbers, you could rename the `COMPACT.EXA` and `FLOAT.BIN` to something else so STOS doesn't load them – saving another 18K. Don't do this to your master disks – always use a backup copy. If your compiled programs are running out of room, then use the compiler options to save you a few K. You can select which fonts and mouse pointers are loaded – one for each resolution. So, if you're only working in low, you can save space by deselecting the medium and high resolution fonts and mouse pointers. Reduce the window buffer to 8K and allow 4K for each window used.

HOT SPOTS

Sprites must be put on the screen with the X position as a multiple of 16. A bit limiting, but easily cured. Simply use the sprite editor to move the hot spot. The X,Y coordinates you use to position the sprite give the point where the hot spot is positioned. For some reason, STOS doesn't like putting sprites on the screen when the X coordinate is zero. You can use the same trick of moving the hot spot to fix this.

STOS OR NOT STOS

"My language is better than yours." Computer language snobs, eh? STOS has a few giveaways that you might like to avoid. The standard mouse pointer has to go – it's pretty awful anyway. Draw your own sprite and use the change mouse command. The "appear" function seems to turn up in every STOS program and gets a bit boring after a while. Why not write your own screen-appearing routines? The standard fonts are rather plain. You can use other fonts by opening a window, which isn't always very useful. If you save your new font to the STOS folder – or COMPILER folder if you have it – with the appropriate name, STOS uses this as the defaults. That leaves you with the GEM-like functions. The menu bar, window borders and file selector instantly identify STOS. With a little bit of effort you could tweak these and sit back with a smug smile as people try and guess if it's assembly or C.

BOUNDER

The manual says you need to place graphics on a 16 pixel boundary when using the `screen copy` command. You can, however, cut them from anywhere as long as the graphic is a multiple of 16 pixels long – something the manual forgets to mention! **stf**

HOW ABOUT YOU?

To order STOS – complete with compiler, Maestro sound package and over 600 sprites – at a saving of £42, turn to page 118. Or do you already use STOS? Got some hot tips to share with the world? Perhaps you need a perplexing programming predicament sorted? Let us know about it! That way, you can share your tip with well over 70,000 other ST enthusiasts and be in the running for our monthly prize of £50. Write to: STOS Surgery, ST FORMAT, 30 Monmouth Street, Bath, Avon BA1 2BW.



STOS surgery

Come in, lie down, relax and tell me all about it. You can talk to me, I'm a

Doctor. Chris Lloyd peers into the STOS medicine cabinet

Programming was once the domain of seriously serious types. Everything was horrible impenetrable assembly code. Then came BASIC – Beginner's All Symbolic Instruction Code. It was designed to be useable by normal people – or at least, those who don't think in hex. There are at least half a dozen different varieties of BASIC for your ST. STOS is designed to make the production of games and other graphic-based programs a breeze. It handles the really difficult bits for you with a range of powerful commands. Not surprisingly it has sold loads of copies – 126,341. Well, thereabouts, anyway. Like all programming though, it isn't all a bowl of cherries – although the manual is one of the better ones, there's still a lot to learn. STOS Surgery brings you a heap of tips every month just for the STOSheads out there.

DISAPPEARING MENUS

The manual tells you how to create menus using the `menu` command. What they don't tell you is that you can get rid of the options again by using a null string. You can empty the options or a whole menu. `menu(2)=""` would wipe the whole of the second menu's third option and all subsequent ones.

Having a bit of bother using a menu with a background on screen? The trick is to use `screencopy` to copy the background picture to the screen, starting eight pixels from the top so it doesn't interfere with the menu. Now, why didn't I think of that?

HOW BIG IS THE SCREEN?

STOS, wonderful as it is, has a few, er, inconsistencies. It's never quite clear which coordinates to use

when defining the whole screen. When using the `reduce` command to compress a screen to half its vertical size, the horizontal size needs to be 319. If you capture the screen as a string and want to paste it down again, the horizontal size needs to be 320. Don't ask why.

SPRITES

Although a sprite bank has its palette saved with it, there's no direct command to retrieve it. It is possible with a bit of mucking about though. Try these lines – the `J`-symbol means no line return yet.

```
10 X=hint (start(1) to J
   (start(1)+length(1),"PALT")*4
20 for A=0 to 15:colour A,peek(X) J
   : X=X+2 : next A
```

Being getting miffed because you've been using the `put sprite` command and the sprites don't appear? It's probably because the screen hasn't been updated yet. The sprite is positioned using the `sprite` command, then pasted onto the screen with `put sprite`. If the screen hasn't been updated then nothing appears. Use an `update` command first.

If you want to get rid of sprites you can use the `off` command, but unfortunately this zaps all the sprites. To get rid of one you could move it to a coordinate off the screen – not bad, but rather crude. The fastest is to use one of the traps. Try – `drag(0)=drag(1)=n:drag(2)=0:trap 5` substituting your sprite number for `n`.

PROGRAMMING EXTENSIONS

One of the advantages of STOS is the way you can add new commands, with a bit of assembly programming and some blood and sweat. Here's a couple of little tidbits. Rather than saving all the command



names when saving a BASIC program, STOS uses a token to represent each command. When you're putting together the token list with your new interpreter commands, the token number 162 doesn't work because of some bug or other. You can get round this by adding a space before the number.

Many commands use parameters – these are variables used in their execution. Each new command uses a table of parameters. When setting up the parameter table for a compiler extension, you can save yourself some space and effort by directing all commands with the same parameters to the same table. Neat, eh?

SORTING SORT

When a dimensioned array is sorted, the whole array gets sorted – not just the element you've used. If the array contains numbers, then any unused elements are zeros. These then come first when you sort the array. If the array contains strings, then unassigned elements hold blank lines – null strings. If you don't know the exact size of the array, then you need a routine to check through the sorted array until you get some data, or work out how many valid elements there are and jump to this point. **stf**

ME TOO! ME TOO!

To order STOS – complete with compiler, Maestro sound package and over 600 sprites – at a saving of £42, turn to page 126. Or perhaps you already use STOS? Get some hot STOS tips to share with the world! Need a perplexing programming predicament sorted out? Let us know about it! In that way, you can share your wit with well over 70,000 other ST enthusiasts and be in the running for our monthly prize of £25. Write in to the STOS Surgery, ST FORMAT, 30 Mornmouth Street, Bath BA1 2BW.



WIBBLY WOBBLE

Remember all that nasty trigonometry maths stuff that seemed to have no use at all? Well, with a little work you can get sexy effects using sine waves. This little listing takes a section from the top right of a picture stored in bank 6 and gives it a ripply wibbly effect much beloved by demo writers everywhere.

Line 10 sets up a blank screen in low resolution. Line 20 reserves a dimensioned array and grabs the palette from memory bank 6. A dimensioned array is a variable with lots of separate elements – in this case, 720: two complete revolutions using degrees. Lines 30 and 40 do some horrible maths stuff converting the degrees into radians, then calculating the sine of the angle. This gives you a series of numbers that cycle between 1 and -1 in a

lovely sine-wave form. Because we're going to use this number as the pixel offset, it's multiplied by 20.

Each frame of the sequence is drawn line by line. We don't want to see this on-screen so the background screen is defined as the logical screen and all the drawing takes place here.

Lines 60 to 70 draw each frame. The `Z` variable is used to step through our array. Changing the step value gives sharper or shallower waves. Line 60 looks daunting but isn't, honest. It copies lines from the picture in bank 6 to the logical screen and each line is offset using your array. The width of the picture has to be a multiple of 16 – here the wobbled picture is 96 by 71. The larger you make it, the slower everything runs. This little number really

shows off the power of STOS – try writing anything this short and powerful in another language!

```
10 key off : Bakh off : curs off : mode J
0: cls : hide on
20 dim ARRAY(720) : get palette (6)
30 for X=1 to 720 step 1 : ANG=rad(X)/35 J
   ARRAY(X)=sin(ANG)*20 : next X
40 logic=back
50 for Z=1 to 360 step 8 : for Y=0 to 71
60 screencopy 6,20+ARRAY(4*Y+Z),Y,116+J
   ARRAY(4*Y+Z),Y,1 to logic,0,Y
70 next Y
80 screen copy logic,0,0,96,71 J
   to physc,115,60
90 next Z : goto 50
```



● The lady herself going through a wobbly patch. Compiling the program speeds everything up enormously. For each frame, your ST needs to do 497 bits of maths as



well as copy 71 separate lines of picture. Try fiddling about with the numbers – if you change the value that `Y` is multiplied by the sine-wave is altered.



→ single sided disk to a double sided disk, the copy I make never runs. Please help - I am getting frustrated by this.

A Gaunton, Lyme Regis.

stf: First of all it sounds as if you are trying to copy commercial games disks. This is illegal. By doing this you are breaking the law, so please refrain from trying. Secondly, auto booting games run because of special code on an area of the disk called the bootsector. This code is not visible in a Desktop window because it is not a file - therefore you cannot drag it from one disk to another. Lastly, with the exception of the specially formatted STF Cover Disks up until this issue, a floppy disk does not use "side 1" and "side 2" in the same manner as a record or a cassette tape. The data is recorded alternately on one side and then the other in the first available tracks and sectors on the disk. So, to copy two single-sided (SS) disks to one double-sided (DS) disk, you simply drag the files from both the SS disks to the DS disk. You could, of course, create separate folders on the DS disk for each of the SS disks in order to keep the files separated.



WHICH DRIVE?

Could you recommend the best external disk drive to add to my system and how much it would cost?

N Craig, Longfield, Kent.

stf: There was a roundup of the best external drives in STF 28. The Cumana CSA354 Drive came out on top with a FORMAT Gold rating of 90%. It is available for £69.90 including deliv-

ery from WeServe on 0705 325354. It may be a little more expensive than other drives but it is well made and very reliable. Check out issue 28 to decide for yourself which you want.



1ST WORD PLUS PROBLEM

When I import a READ.ME text file from a PD disk into 1st Word Plus I can't use the Reformat option to tidy up the text prior to printing it out. When I try to reformat the file, the program seems to treat each line as a separate paragraph. Why is this and how can I cure it?

R Holden, Prestbury.

stf: 1st Word Plus uses a control character instead of a space (ASCII 32) in its documents to enable it to format text. Use the Replace option from the Edit menu and enter a space in the edit line of the box marked "Replace." Then use the down cursor arrow to move into the edit line of the box marked "With." Press the <Control> key and the number 6 and a strange character (ASCII code 30) appears in the edit line. Select the "All" option in the Scope field and click on OK - all the spaces in the file are replaced. You should now be able to reformat your Read.Me document with no trouble.



DODGY KEYBOARD

I have recently started having problems with my keyboard. Sometimes some of the keys on the right hand side seem not to work at all, and at other times they work perfectly. It has become very frustrating when I am trying to produce a letter or other docu-

ment and the keys suddenly pack up. Have I contracted a new and unusual virus?

D Jackson, Whitley Bay.

stf: It's unlikely to be a virus with these symptoms. It sounds as if you may have an intermittent problem with your machine's keyboard matrix causing some parts of it to "die" at various times. Take it to your local repair centre or send it to WTS Electronics Ltd. They offer a diagnostic service for £15, after which they give you a quote for the repair costs. WTS Electronics are at Studio Master House, Chaul End Lane, Luton, Beds. LU4 8EZ. ☎ 0582 491949.



MEMORY LOSS

I have upgraded my 520STFM's memory to 1MByte using the Power 512K RAM expansion. The machine seems to be working properly but I am unable to install the RAMdisk from Cover Disk 31 to be any larger than 256K. How can I check that the extra memory is working?

F J Fishwick, Bolton.

stf: Use the Free Space utility program which was also on Cover Disk 31 to show you how much memory you have available. If you only have 375K with no Desk Accessories loaded, this means your upgrade is not working. If it was installed for you, return it to the people who did the job and they should fix it for free. If you installed the upgrade yourself, then you're likely to have to pay to have it checked. If there are no local computer repair services near you, WTS Electronics (☎ 0582 491949) offer a diagnostic service for £15.



STOS surgery

More of your STOS programming queries sorted by Asa Burrows

THE KEY TO THE PROBLEM

Please can you help. I am trying to write a utility with STOS but I am already stuck on the menu. I have programmed a routine to check for a keypress of about ten keys, but I have found that the routine only recognises a keypress sometimes - most of the time it doesn't. It's driving me mad. I wouldn't be surprised if it's something simple - I am still a learner.

Mark Moffatt, London.

stf: This is a cut-down version of Mark's keypress routine. (The .J symbol simply means that a single line of listing wouldn't fit on one of our column lines here.)

```
100 if inkey$="a" or inkey$="A" then .J
    goto program 1
110 if inkey$="b" or inkey$="B" then .J
    goto program 2
120 if inkey$="c" or inkey$="C" then .J
    goto program 3
130 goto 100
Many learners could easily miss the problem here. This is what the routine should be.
100 as$="" : while as$="" : as=inkey$ : Wend
110 if as="a" or as="A" then gosub program 1
120 if as="b" or as="B" then gosub program 2
130 if as="c" or as="C" then gosub program 3
140 goto 100
```

Notice that the version Mark should have done is in fact very similar to the one he actually did. The difference is that the second version is using a while loop on the very first line, so when a key is pressed the program then checks to see what key was pressed. The reason Mark's version didn't work is that STOS stores all the keyboard presses into a buffer. The inkey\$ command is a pointer to that buffer, and when you use it, it returns the character it is pointing at in the buffer but then increments itself to point to the next character in the buffer.

Buffer

```
K
J
A
a
B
b
c
none
none...
```

Last Character inkey pointer Next Character

Notice in this example that inkey\$ returns character a the next time you use the inkey\$ command, then increments itself to point to character B and so on. If you don't want inkey\$ to point to the next character, then use the

clear key command to clear the buffer before you return to the while loop. Notice too that the second version of Mark's program is using a command called gosub instead of goto which Mark seems to prefer. It is best to use gosub - it makes your program more presentable and easier to debug.

GOOD HOUSEKEEPING

I'm having a bit of a problem with this program I've written. For some reason when it's running it stops for a second. I can't work out why. I've enclosed a listing of the program.

Tony Blake, London

stf: The details of Tony's program aren't vital here, but other STOS programmers might be experiencing the same thing. The problem is that you have too many variables doing things they shouldn't be doing and you have variables that are doing tidy. STOS is garbage collecting. You can get round this problem if you use a dummy variable and use the free function

dummy = free

This forces STOS to do the garbage collection, so if you insert this in the right place you can

THE SKY AT NIGHT



My main hobby is computing and I would like to be able to incorporate it with my other hobby, astronomy. I have searched around all my local ST software shops but I have been unable to find any astronomy software. Do you have any idea where I can get any from?

M Kirk, Weston-Super-Mare.

stf: The ST Club PD library has a selection of astronomy disks available. UTI.38 contains Star Chart, which is based on the Yale star catalogue. UTI.39 contains Planet, which shows and identifies over 1,500 stars but works in high res only. UTI.48 gives a planetary view of the constellations and UTI.49 features Astrolabium which enables you to draw constellations, star names, meridians and different grids. All these disks are great value at £1.45 each. The ST Club are on = 0602 410241.

STEREO STFM?



I have a 1040STFM I use for processing samples and writing programs - games mainly - using STOS and the STOS Maestro sampler and software. Is there any way that I can produce stereo output for my music and samples without buying an STE?

N Henty, Middlesbrough.

stf: Yes, you can produce stereo samples but you need to buy the Stereo Playback and the Stereo Master cartridges from Microdeal. Stereo Master enables you to record and modify stereo samples and Stereo Playback enables

you to output the results to your hi-fi even on an STFM. When Stereo Playback was reviewed in STF 22 it received a rating of 82%. Both packages come with software routines in all major versions of the BASIC languages to enable you to incorporate stereo music into your programs. Playback is £22.95 and Stereo Master £39.95, both from Microdeal = 0726 68020.

DESIGNING KITCHENS



I am looking for a reasonably priced (under £200) CAD package that can enable me to plan and design fitted kitchens and other household fittings for my small business. At the moment I am doing everything by hand and I am sure that using my Mega4, SM124 monitor, 40MByte hard drive and KK-P1123 printer would speed things up. A two dimensional package would be fine - for what I'm doing I don't need a 3D CAD program.

K Caswell, St Helens.

stf: FORMAT Gold rated GFA Draft Plus v3.13 is a substantial comprehensive package for you. It provides all the standard options found in a Computer Aided Design (CAD) package and has a library of over 100 preset symbols included. You can also design your own customised symbols, then add them to the library for future use. There is a detailed 225 page manual, and the disks are not copy protected, so you can easily transfer the package to your hard drive following the installation instructions in the manual. GFA Draft Plus v3.13 costs £99.95 and can be purchased direct from GFA Data Media (= 0734 794941).

LEAD SWAPPING



I have an Atari SM124 high resolution mono monitor for serious use and a portable colour TV for games sessions. Is there a way that I can leave both items plugged in? I am worried about the constant plugging and unplugging of the monitor lead.

E Hill, Ilford.

stf: The quickest and easiest way to solve this problem is to use a monitor switcher box. If you plug the SM124 into the unit it doesn't matter that the colour monitor socket is empty when you switch from mono to colour. You can then use your colour TV, disabling the SM124. Best Prices (= 0903 700714) provide a monitor switch box for £15.99 including delivery.

AMAZING DATABASE REQUIRED



I need a database program to store the details of my CD collection. I do not just need the normal fields such as "Artist" and "Title" - I want to go into much more detail. I would like to select the "Tracks" field for a CD and have a list of the songs come up on screen. Then I would like to select a song title and have the lyrics appear. I only have a 520STFM, so some kind of loading of data "on the fly" would need to be employed.

R Nettleton, Sheffield.

stf: One inexpensive program that should do the job is called Hype! It is a Hypertext package

- an information retrieval system based on a series of nested cards. Each card takes up an entire screen and can contain graphics or text, or a mixture of the two. Areas of each screen can be set up as buttons to move to the next layer of information (song title to lyrics, say) or back a level. A demo version of the program is available from Goodman Enterprises (= 0782 335650) on disk GD615 for £2.75. Try it. If you like it, you can get the full version for £20 by registering the demo version.

STOS SPRITES



Here is a short STOS routine from Keith Feeney of Leeds that enables you to get the colour palette from a sprite bank loaded in memory. Normally a sprite bank uses the current colours. The J sign means don't type a return yet - the line was just too long for our column!

```
10 A=HENT(START(1) TO START(1)+LENGTH(J
    (1), "PAL")*4)
20 FOR X=0 TO 15: COLOUR X,DEEK(A+X*2):J
    NEXT X
```

ROBOTICS



Andrew Cooper of North Humber-side asks for details on how to construct an interface to control a robot.

The simplest solution would be to use the ST Input/Output Port from Switchsoft (£26.95, = 0325 464423). The device has 13 inputs and eight outputs and is supplied with a manual detailing BASIC control commands to incorporate into your own programs. Couple it with Technic Lego and you should be able to construct some interesting robots.

BOMBED OUT



My brother owns a 520STE which has been working fine for the first three weeks but now we constantly get bombs appearing every time we start up the machine and the keyboard and mouse do not work. We have checked all the connections and they seem to be correct. The problem happens with all software, games and PD, and even occurs if we start the ST without a disk in the drive.

Koolsum Adam, London.

stf: Your machine has a hardware fault if it will not boot up at all. It is still under warranty, so return it to the shop where you bought it and they should replace it or repair it free of charge. If you bought it privately, then you'll have to have it repaired at your own cost. This is because you buy goods privately at your own risk - if they break down after a while then it becomes your problem. To be sure of reliable service and a fair deal, it's always a good idea to use a recognised repair centre such as Eve-sham Micros (= 0386 765500), who have a fixed repair rate of £65. **stf**

BACK ISSUES

If you don't have a copy of any of the previous issues of ST FORMAT mentioned in these pages and want one for further information on a subject, turn immediately to page 78 for details of STF's back issue service.

make STOS garbage collect before you run your critical section.

PROGRAMMING MUSIC

I am a dedicated ST owner and I am currently learning to play the keyboard, so I obviously have an interest in creating music for the ST. I own a 520 STFM and STOS. Can you tell me what music packages are compatible with STOS? Is Quartet, and if so does it create music using notation and samples? Also what other extras do you recommend like memory, Playback or other hardware or software?

M Shepherd, Co. Durham.

stf: Most commercial music packages are compatible with STOS, although you're likely to have to load their machine code playback routines into a STOS program bank. You can create music in Quartet using notation and samples. Quartet comes with a large selection of sampled instrument sounds. If you wanted to sample your own sounds - voices, say - you'd have to buy your own sampler. The most useful extra would be a hard drive - extra memory is invaluable for storing those samples, which can rapidly get much bigger than you expect.



Stereo Master, some speakers, and my STE

I am thinking of getting Stereo Master and Zi-Fi speakers for use with my STE.

- 1 Do I need any extra peripherals to run and use Stereo Master?
- 2 Can I produce samples like the ones on STF Cover Disk 31?
- 3 Can I use Stereo Master without MIDI support?
- 4 Do the Zi-Fi speakers work with all software packages (games) or just with music programs?
- 5 Can I record the output of the ST onto cassette?

1 Where can I buy Stereo Master and Zi-Fi?
Phillip Eccott, Bristol

stf: 1 No, Stereo Master is self-contained, with software, a cartridge and a 3.5mm stereo jack lead to connect to your input source.

2 Yes, you can.

3 Stereo Master can be used without any MIDI instruments connected. MIDI support is an extra feature of the package.

4 Yes, the Zi-Fi works with games because all of the STE's sound output is routed through the stereo phono sockets.

5 You can use a phono lead to connect your STE's phono sockets to the AUX inputs or CD inputs of a hi-fi system and then use the tape deck to record as usual.

6 Stereo Master is available from STF at only £29.95, saving you £10 – see page 46. Zi-Fi is £39.95 from Evesham Micros = 0386 765500.

DESKTOP EDITOR



On ST FORMAT Cover Disk 13 there was a program called GemPlus to edit the Desktop icons, but unfortunately it does not work on the STE (which I have). Do you know of a PD utility that will enable me to do this on the STE? I don't want a replacement Desktop program, just some new icons.

stf: The only such program we know of is the Window Icon Editor. The editor program is designed for high resolution only but does work

Jeremy Holland, Buckingham

with a mono emulator, and the icons designed can be used in any resolution. It is on disk GD928 from Goodman Enterprises (0782 335650) and costs £2.75.

WHICH PITCH?



I am going to get a colour monitor for my machine, having stuck with a TV for the last five years. I have narrowed my choice down to the Philips CM8833 Mark 2, the Atari 1435 (which is a Philips CM8833 Mark 2) or the Protar Vista C14M (which is a Philips

CM8833 Mark 2). It looks as though I will get the Philips whatever I decide. However I believe that the monitor has a dot pitch (dot size) of .42mm whereas top quality colour VGA monitors have a dot pitch of .28mm, giving a sharper image. Can I use VGA monitors with my machine to produce a better image?

Ian Lyall, Aberdeenshire

stf: No, you cannot use a VGA (Video Graphics Array) monitor with an ST. They are designed for use with the high res output of PC-compatible VGA graphics cards, which is usually 640 x 480 pixels, and although this is practically the



STOS surgery

More of your STOS programming queries tackled by Asa Burrows

STOS MUSICIAN

I own an ST, a MIDI keyboard and STOS. I am interested in recording and playing my keyboard's notes and voices to and from a dimensioned array within STOS. Can this be done, and if so, how?

Graham Elliott

stf: Yes, Graham, and the solution is yours on this issue's Cover Disk! It's an extension to STOS that not only enables you to copy what comes in from the MIDI port but also enables you to send it through – it would be a bit useless if you couldn't! Being able to send data to and from the MIDI ports opens up many avenues – you could record your masterpiece from your MIDI keyboard, then play it back again, or you could program a networked ST game, where you could theoretically have up to 16 STs connected together! (If you do end up creating something like this, be sure you let us know about it, won't you!) Read the document file MIDI.DOC on the Cover Disk for an explanation of how to use the commands.

IT'S FULL OF STARS

Is it possible to have different layers of scrolling in STOS BASIC, so you could create effects like parallax stars?

K Cadogan, Leyton

stf: Yes, it is possible to have parallax scrolling

within a STOS BASIC program, although it wouldn't be very fast. You would achieve this by using the SCREEN\$ command, which automatically overlays the source image in a string with the destination screen. Look up this command in the STOS manual for an explanation of how to use it.

JUST ADD TEXT

I am a great fan of STOS BASIC and after reading your STOS Surgery section in STF 31 I tried the sine-wave program. It's great and works wonderfully. Could you possibly list in your next issue a program to show some good style lettering, to scroll along the screen while the sine-wave program is wobbling in the background?

Mark Winter, South Yorkshire

stf: This is possible, Mark, although we won't write a program to do it for you – it is always best to learn something when you do it yourself. On the Cover Disk there's a program called PROG0001.BAS, which scrolls a string of text along the screen and that's it. Use the SCREEN\$ command and you can adapt the program to work within the sine-wave program and have the wobbly screen working in the background.

The Cover Disk program works by reading the text from the data statements into a string variable (lines 120 and 130), making it easier to hold all the text in a single variable. The program then makes use of the SCREEN\$ COPY command's ability to copy graphics from a pixel offset, rather than from a 16-bit set boundary as the STOS manual describes. The program also uses the screen swap technique to prevent

flicker when the system is updating the screen. Notice that line 170 sets the logical screen address to the back screen address, prints the text and then sets the logical screen back to its original address. This is because the PRINT command always prints to the logical and back screen regardless of whether AUTO BACK is on or off, which can sometimes be a real pain.

You should be able to work from this.

CASTING FOR A TYPE

I am trying to find some quick method for finding out what machine a STOS program is running on, so I can identify STEs and change some program routines accordingly. I know that the ROM version number is stored in BCD format in the two bytes at address \$E00002 but I cannot get STOS to DEEK above \$400000. This is apparently the highest RAM address. Attempting to DEEK above \$400000 if the bus error. Is there any way to DEEK the ROM?

Paul Vincent, Cardiff

stf: With the STE STOS Extension STF gave you on Cover Disk 32, you can find out whether your program is running on the STE or not. You say you can't DEEK above \$400000. It is actually possible to address above \$400000 if the address exists, although if you access these addresses directly your program might not be compatible with future machines, and it would have been easier to go through a system trap.

SHORT CUT

In STF 32 we talked about getting rid of sprites. The method described does work, but it is simpler to use



READERS' TIPS

HARD DRIVE HANG-UP TIP

In ST FORMAT 13 Roland Given claimed that the only way to rescue a hard drive from a corrupted ICDBOOT.SYS which crashes the drive is to use the HDUTIL.PRGM copied to a RAMdisk before the hard drive is limed on. There is a much simpler solution as long as you have an ICD card. On the floppy disk supplied with the ICD interface is a program called ICDBOOT.PRGM. This file installs and boots the hard drive. Simply follow these steps.

- 1 Turn off the ST but leave the hard drive on.
- 2 Insert the floppy with ICDBOOT.PRGM in drive A.
- 3 Switch on the ST and hold down the <Alternate> and the left <Shift> keys.
- 4 The Desktop now loads from the floppy disk, not the hard drive.
- 5 Run the ICDBOOT.PRGM from the floppy disk.
- 6 Press a C icon from the Desktop and you are now able to access the hard drive and get to the corrupted files.

Richard Fitzgerald, Essex.

same as the ST's high res mode of 640 x 400 pixels they are not compatible. The ST's low res colour resolution is based on the CGA (Colour Graphics Adapter) standard of 340 x 200 pixels. When a PC-compatible with VGA colour graphics runs a CGA colour game it emulates a CGA display, resulting in the same picture quality as you would get on a CGA monitor anyway.

STILL SINGLE AFTER ALL THESE YEARS



I have an older STFM with a single-sided disk drive. I have been using the B-Boot program from ST FORMAT Cover Disk 5, but this does not work with the new games I received at Christmas - my machine reads drive B for a few seconds before reverting to drive A and crashing. What is the best way for me to modify my machine to be able to run my new games?

Phillip Orrell, Shropshire

stf: The best thing for you to do is replace your internal drive with a double-sided model. Although this sounds like a drastic solution, more and more software is now being released on double-sided disks only - including ST FORMAT Cover Disks. Internal drive upgrades are now very affordable, costing little more than some

games: Power Computing (= 0234 843388) can supply a double-sided internal drive (part no PC7201) for just £35. Full instructions on replacing your internal drive were in the Desktop pages of ST FORMAT 32.

WHO IS THIS ROGER WILCO ANYWAY?



I own a 520 STFM and like flight sims. Are there any companies that produce more realistic sims rather than the ones that are on the market today?

T Akers, Staffs.

The most realistic sim you can get is a matter of opinion - after all, unless you've flown all the planes how are you to know? ProFlight from Hi-Soft (£39.95, = 0525 718181) is probably your best bet, though.

FAILING MEMORY



I have a second-hand 520STFM which has been upgraded to 1MByte of memory with the extra RAM chips mounted piggyback on top of the originals.

Unfortunately the upgrade seems to be incomplete because I cannot run programs that need more than

the command `SPRITE OFF n` where `n` is the number of your sprite. Thanks to **Paul Vincent** of Cardiff and all the other readers who wrote to point this out - you are all brilliant!

SMOOTH GAME MAKING

I am writing a game at the moment which has a time limit in it. This is easy, but when it comes to displaying the remaining time on-screen I get a few problems. At first, I used `LOCATE` but it made the sprite's movement jerky, pausing every second and then zooming ahead to keep up. I then tried to fill in small segments on my status-bar-type thing with the `PAINT` command but this was even worse, re-drawing the sprites after each paint. I then tried drawing a bar showing time left, but this has the same result as `PAINT`. Eventually I tried `DRAW` to slowly cover up the passed time, but this had the same effect as `LOCATE`. I finally came up with the following listing, which delays drawing the line until the sprite is not moving, but this sometimes causes big delays and gaps in my bar. My listing is:

```
100 rem - This part in the main program loop
110 if timer<41 and movon(1)=0 then gosub 500
```

```
500 TIME-TIME-1
510 draw 0,TIME,0 to 0,TIME,10
520 timer=0
530 return
```

Is there a better way of doing this?

Andrew Cooper, Herts

stf: The problem is not with the initial part of this program but with its entire structure. This is because all the options you said you have tried should work fine. When machine code program-

mers program a game, they all use basically the same techniques. When they structure their programs, they set up a logical and a physical screen. The physical is displayed all the time and the logical is sitting somewhere else in memory, out of the player's view. This enables the programmer to display the game in frames drawn so many times a second, depending on how much the machine has to do before the frame is displayed. They do this by drawing the game's next frame on to the logical, then swapping the physical and logical screen addresses so the logical becomes physical and vice versa. Before the program actually draws the next frame it then checks various things like the joystick, sprite anim, sprite movement, timer, and so on. This enables the program to run totally flicker-free, with all timers and sprites moving smoothly. The programmer's main program loop would look something like this:

```
Check joystick/keyboard
update sprite
update anim
update huddle movement
update timer/s
do any other special activities for the game
draw sprites, timer, and so on...
swap logical and physical, wait for screen vbl
repeat
```

When you program a game with STOS it's best to use the same technique. You can do this by turning `AUTO BACK` and `UPDATE` off and setting logical to the back screen. You can still use the movement and animation commands with your program - just tell STOS when to update them instead of leaving STOS trying to do it every fiftieth of a second. Your game then

works much more smoothly and all of your program's routines slow down in relation to each other.

To help you out, `PROG-0002.BAS` on the Cover Disk contains two simple timer count-down routines.

SPEAK UP, CHANNEL 3

Scott Evans from Cardiff is only 16 years old and is a very good programmer, judging by the many tips he has sent in. One is `PROG0003.BAS` on this issue's Cover Disk - it's a little routine that gets the volume of the ST's three voice channels. Line 130 is the important line in this program - the line that does the stuff. `POKE $FE800,j+8` tells the sound chip to return the volume of channel 1(8), 2(9) or 3(10). `VAL (PEEK($FE800)*3)` gets the value returned by the chip and multiplies it by three. The number returned is in the range 0 to 15 because the sound chip only has 4 bits for amplitude with each channel. Thanks, Scott, for that tip - it's no doubt going to be used by many STOS programmers! Watch for more of Scott's little gems in future issues.

WATCH THAT SOUND

Graham Cruickshanks from Scotland has sent in a very nifty little program which displays the sound wave of a sample from bank 5. `PROG0004.BAS` is that program, and it's on this issue's Cover Disk.





STOS Corner — Asa Burrows tackles your STOS queries

SOMETHING FOR NOTHING

I've got some simple questions about STOS.

- 1 Can I have full screen sprite movement and animation while scrolling the background full screen — for example, no borders?
- 2 Can I have more than 16 colours on-screen without invoking the Horizontal and Vertical interrupts?
- 3 Also, can STOS make me a cup of tea? Is this possible without having to use machine code?

How Davies, Bangor

stf: No. If you don't want borders, but do want flashy colours and a cup of tea, you need to learn machine code. The only way to incorporate machine code movement and animation is to write an extension for STOS to enable you to create the commands that you want. GFA Assembler on this month's special Cover Disk can do the job for you. See page 6 and start learning assembler now. Assembly code can easily be compiled into machine code.

BY YOUR COMMAND

I am presently using STOS 1.62 on an STE and find that when I use the **Move** command — to move a sprite, for instance — I cannot use a letter for the speed variable. This makes programming very awkward if I want to change the direction and speed of a sprite consistently. For example:

```
move x 1,"(5,5,0)"
```

If I could do the latter, it would be a little better. Do you know whether this is possible on a later version of STOS?

Mr V McClure, Devon

stf: It's not possible to do this on any version of STOS Basic and it's unlikely to feature in any versions of STOS. You can, however, simulate it with a variable, by using the **SET** command in this way:

```
as$=str$(a) : move x 1,"("+as$+",5,0)"
```

This is just an extremely basic example — if you use the string commands carefully, you should be able to get it running fairly quickly.

ABSOLUTE BEGINNERS

I have some questions about STOS.

1. How do you design and make the background screen?
2. How do you make them all into a program?
3. How do you move the sprites with the mouse or joystick?
4. How do you make the title screen?
5. How do you make the menus for different things?

Giuseppe Elia, Peterborough

stf: You are clearly a newcomer to programming. You should go to your local library and study books on BASIC programming. You don't need to find a book specifically dedicated to STOS to begin with, because STOS is a version of the BASIC programming language. There is not enough space in STF to answer all your questions in detail, but if you work carefully through the examples in the STOS User Manual, it becomes easier to understand and you should soon be able to answer your own questions.

ST answers

INTERNAL INJURY



I have started having trouble with my internal disk drive. I am getting messages that the disk is write-protected when it is not. If I eject the disk and reinsert it, it sometimes works okay. This is happening

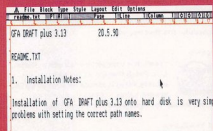
more and more often. Please advise me — there are not many ST repair centres in Finland.

Juha Tolvanen, Finland

stf: There may be a bad connection to your drive which is causing an intermittent fault, or it

could be the drive itself. See if you can find a local computer shop or PC repair centre to have a look at the drive — they don't have to be ST experts, because 3.5 inch disk drives for PCs are practically identical to the ST's. They should be able to sort out this problem for you.

Write On? Right On!



● Don't worry if you have weird lines in your Write On! printout — simply turn off the corner clock.

WRITE OFF?



I am unhappy to discover that I am unable to get a correct printout from Write On! from your Cover Disk 33. At first, I thought that it was something wrong with my printer or the printer driver, but the

printout was perfect except for some rather strange lines across the page. They appear over each line of text. A friend of mine with a different printer and using a different printer driver had exactly the same problem. Why are the lines there, and how can I get rid of them? A word processor isn't much use if it can't produce a decent output.

William Kent, Oslo, Norway, via Bath BBS

stf: This is caused by a Desk Accessory or a memory-resident program interfering with Write On! — there is nothing wrong with the printers or printer drivers themselves. Try booting Write On! with no Desk Accessories loaded and see how it runs, then load Accessories one by one until the problem occurs again. This process of trial and error should determine which program causes the problem. It is good working practice to check all memory-resident programs if you ever have problems running an application.

WRITE ON AND ON



I have a couple of questions about Write On!, on Cover Disk 33.

- 1 Why was there no manual provided with the program?
- 2 Is my copy a fully paid up legal copy which I can use as much as I like?
- 3 Am I obliged to register the program?
- 4 Why do I get a £ symbol with <Shift> and <3> when I should get a hash sign (#)?
- 5 How can Write On! print out in more than the three fonts built in to my printer?

Seth Sonenthal, California

stf: We gave you the details of Write On!'s operation in STF 33 and 34, but the official 132-page manual is available from our mail order service (see page 60) for £15.00. Write On! is a complete full priced package distributed under licence by ST FORMAT and not given away — the

DOT TO DOT

I would like to achieve horizontal scrolling in units of less than 16 pixels while using sprites. I have been able to scroll from one screen to another in units of four pixels using the Screen Copy command, but this is too slow. Is there any other STOS Basic method or a machine code routine? I have Devpac 1 but do not understand assembly language.

Neil Anderton, Colchester

stf: There are many ways of scrolling horizontally within STOS, although all the methods use the Screen Copy command. If your machine is an STE, then you could use the hardware scrolling commands contained within the STE Extension which ST FORMAT gave you free with issue 32, and you could write sprite routines for use with the Blitter Extension that was yours on Cover Disk 33 – turn to page 44 to order your copies now if you don't have them. Alternatively, you could purchase STOS Tome, which enables you to create backgrounds with tiles,

and, by using its own built-in commands and some Screen Copy commands, you can have fast smooth scrolling backgrounds as well as many other special features. Tome (£18.95) is available from Shadow Software, 1 Lower Moor, Whiddon Valley, Barnstaple, N Devon EX32 8NW and should be part of any serious STOS programmer's software collection.

SOUNDS FINE TO ME

Can you get disks full of sound effects for use with STOS without buying STOS Maestro? If so, where can I get them? Also, how can I get rid of the menu bar from the top of the screen?

Tim Plant, Halifax

stf: The best place to find sampled sound effects is in PD libraries – see STF's directory on page 38. One of the best PD libraries for obtaining STOS Maestro samples is Goodman's PDL (# 0782 335650), which is also the official

STOS library. To get rid of the menu bar at the top of the screen, use the Key OFF command, and recall the bar with Key On.

TRACKER

(BOOMA HOOMA CHOOM)

I am thinking of writing a kHz tracker/sampler program for my STE. How can I direct a sample through channels one to eight, to make it an eight channel sequencer? Is there a way in STOS of getting eight samples playing through the DMA at once?

Michael Bartlett, Kent

stf: This is not possible from within STOS itself – you need to learn assembly language and study the way that the STE's DMA works (see page 6 for your guide to GFA Assembler). A good place to start doing this is to look at Atari's DocSupport Two Kit – New machine Programming Guides. It costs £29.99 from the Atari (UK) Spares Administrator on 0753 533344.

BUYER SEEKS GUIDANCE



I have had my 520 STFM for over a year now and use it for playing games. I am now keen to exploit the ST's music capabilities and want to build a small MIDI setup – keyboard, sequencer and drum machine – and would like to know what to buy. I have a budget of around £400 and don't mind buying second-hand. I would like a reply, if only to stop me walking into the nearest music shop like a lamb to the slaughter!

Richard Shoemaker, Hampshire

stf: Well, you've started with the right machine – the ST is the professional musician's machine

of choice – and ST FORMAT gave you Gajits' Sequencer One with issue 30. This is one of the few sequencing programs which works with only 0.5MByte of RAM, so you don't have to expand your ST's memory. (If you missed it, turn to page 62 and order it now!)

Check out our Buyer's Guide on page 132 before buying anything. Buying second-hand is a good idea. Most of the music magazines run readers' adverts and you can get some good bargains. The prices below give you an idea of what you can expect to pay this way.

Inexpensive keyboards usually have miniature keys, like the cheapest of the Yamaha PSS

READERS' TIPS

ALTERNATIVE CIRCLES

Paul Tasker of Yam in Cleveland has a Degas tip. When drawing a circle in Degas Elite, instead of clicking the left mouse button, press <Alternate> and then tap <Insert>. This activates a circle lock which enables you to draw perfect circles.

copyright is retained by Compo Software. Write On is not PD or Shareware and cannot be distributed as such. However, you may use the Cover Disk copy for your own use without restriction. If you register your copy of Write On with Compo (# 0480 891819; £7.50 for one year's support or £15 for lifetime support), they can supply you with the US version of the program which solves your £ symbol problem. Write On prints in graphics mode, so the resultant output has nothing to do with the internal fonts of your printer.

OH BROTHER



What printer driver do I need to use for the Brother S2518 and Write On? I do not have an instruction manual for this printer.

Mr G Watson, London

stf: In most cases, either Epson FX or IBM emulators work with any 9 pin printer. Try installing the program with the Epson printer driver – if this does not work, try the other drivers until you find one which does work. Contact Brother on 061 330 6531 to check out instruction manuals.

AZERT YOURSELF



Several people have enquired about foreign language versions of Write On, including Pol Quinet in Belgium, Hans Gustavsson from Sweden and Tis Amor from Villeurbanne, France. They want to know if there is any way of getting Write On to work with the French AZERTY keyboard.

stf: There is actually a French AZERTY version of Write On available from Compo, which they

can supply when you register your ST FORMAT

Cover Disk version of Write On with them; there are also German, Swedish, Danish and US language versions available. You can find details in the READ_ME file in Write On about what you have to do to register. The registration fee for lifetime support from Compo is £15.00. Contact Compo Software, 7 Vinegar Hill, Alconbury Weston, Huntingdon PE17 5JA England, # 0480 891819. Please state which language version you require when you register.

● For special offers to help you get even more out of Write On, turn to page 60.





STOS programmers' surgery

More of your STOS problems solved by Asa Burrows

NOT SPRITE RIGHT

I can't get the sprite editor to work with the STE extension (STF 32) installed, so I'm unable to use the extra colours in the palette. What am I doing wrong?

Andrew Camobell, Midlothian

stf: We have been unable to duplicate whatever you are doing wrong – our machines had no trouble using the sprite editor with the STE Extension. The only possible explanation we can find is that you could be running out of memory in the sprite editor on a 520STE. More importantly, the sprite editor wasn't written to make use of the extra colours in the first place, so unless you are planning on changing your colour in to take advantage of the extra palette colours in your sprites on the STE, you would be unable to use the extra colours anyway.

SPEECH THERAPY

Is there any way to get sampled speech within a STOS program on an STE? If there is, how should I go about it?

Dan Smith, Edinburgh

stf: You can use a sampling package like STOS Maestro or Master Sound to make samples of live speech, and then use the STE Extension commands (on STF Cover Disk 32) to replay the samples directly through the Digital to Analog Converter (DAC) in your STE without taking up processor time. This enables other processes to continue while the sample is being played.

TRACKER TUNES

I need a program to enable me to load and play Tracker tunes in STOS Basic. Where can I find one?

James Quinney, Fife

stf: There is a PD extension called STOS

Tracker which can do what you want. It is available from Goodmans PDL (☎ 0782 335650) on the disk called BAS 25 and costs £2.75.

SCROLL ON

I am having difficulty scrolling through several screens when I make games. I used Neochrome to design my picture for the backgrounds. Should I use this? What am I doing wrong?

Ben Passey, Merseyside

stf: The best method is to use the map definer you get with STOS. This enables you to create backgrounds made up of 16 by 16 tiles. In this way, you can create a series of tiles and place them in your program to make a seemingly continuous background. It is not really a good idea to use full size pictures created with art packages such as Neochrome to create background scrolling because this takes up a lot of memory.

BACKUP PROBLEMS

How can I back up STOS? I tried using the ST's Desktop copier as in the manual and Procopy, but when I loaded the copy all I got is the orange bit at the top of the STOS logo.

Luke Chatburn, Oxford

stf: The most probable cause is that there is a problem with your original STOS disk, or there may be problem with the disk drive on your ST. Try to back it up on a friend's machine to check where the problem is.

STRING QUARTET

Is it possible to import songs from Microdeal's Quartet into STOS Basic programs? If so, how do I go about it?

Steven Ball, Manchester

stf: In the directory SINGSONG on the second Quartet disk there is a small program called SINGSONG.PRG which you should load into any

of the program banks – apart from the reserved ones – within your STOS Basic program. Load EXAMPLE.BAS from Quartet – this contains a BASIC listing which shows you how to load and play a song. Follow the instructions in the Quartet manual and you will be able to play the song. Don't forget to create your song with Quartet first.

IMPOSSIBLE DEMAND

Can you convert STOS .PRG files back into .BAS files? Also is it true that TOS 1.4 owners should avoid non-STE compatible programs?

James Marson, 5 Yorks.

stf: It is impossible to convert a .PRG file back into a .BAS file. It is not true that STOS is not compatible with TOS 1.4. You should update your version of STOS to 2.6 so that any programs you write will work on the STE. Goodman PDL can supply you with a free STOS language update if you send them a blank disk. (They're at 16 Conrad Close, Meir Hay Estate, Longton, Stoke on Trent, Staffs ST3 1SW.)

KEYPRESS QUERY

How do you determine which function or arrow key has been pressed? I find that these return an ASCII value of 0. How do I get around this from within STOS?

John McKechnie, Scotland

stf: The keys return 0 for the ASCII code – you need to check the Scancode of the keys. You can do this by using the `scancode` command which is fully documented in the STOS Basic manual. The `FREE` command enables you to jump to a subroutine directly on any function key or shifted function key.

EXTENSION PROBLEMS

How do I get the STOS STE extensions that were on the Cover Disk in STF 32 into the STOS folder of the language disk? I've tried to change the file extension .EXF but this does not work. The extensions are not accepted by my ST. What am I doing wrong?

Mr D Rathod, Lancs

We can't tell what you are doing wrong from your letter, but these are the main points to check:

1. Have you copied the extensions into the right directory? The .EXF file goes into the STOS folder on the STOS language disk and the .ECF goes into the Compiler folder on the Compiler disk.
2. Do you have any other extensions using the same extension .EXF/.ECF? If you do, give them a different extension name. This name must be .EXn for the STOS folder and .ECn for the Compiler folder. Replace "n" with a different letter that is not used by another extension in your folder, but not the letter "B". The letter for the Compiler folder's version must be the same as the interpreter – .EXF in the STOS folder and .ECF in the Compiler folder.



STOS and Neochrome

SPRITLY ADVICE

How can I get sprites to move over a background that I have created in Neochrome?

Martin Wright, Plymouth

stf: Reserve a datascreen and load your Neochrome picture into it as follows:

Reserve as datascreen 5

Load "picture.neo",5

Use the `screencopy` command to copy the picture to both the background screen and the physcreen.

Screencopy 5 to back

: screencopy back to physcr

Now set up your sprites in the normal manner and animate them using the `move` command.

I KEEP SEEING THESE STRANGE COLOURS

Can you tell me how to stop the writing going red after I load a background picture from Neochrome when I use STOS to make games?

Robert Smith, Dorset

stf: This happens because the NEO picture has a different colour palette from the one used to create the sprites. You have to use the same palette for creating sprites and backgrounds in order to retain the original colours. This applies no matter what package you are using for the backgrounds. Use the Palette command to set the desired colours from within STOS.

STOS

WATCH OUT!
STOS doesn't run with TOS versions above 2, so if you've upgraded to v2.00 or have a Mega STE or a TT, you can't use the program

Are we good to you or what? Two brilliant pieces of software grace the second Cover Disk! *STOS* is the complete game-creation package – an easy-to-use BASIC programming package with 320 powerful commands. *Animaster* is a comprehensive sprite designer and animator, enabling you to create professional-quality sprites and use them in your own *GFA Basic* programs. Chris Lloyd steps shyly up to the podium and does the honours



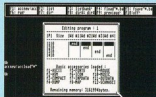
READ THIS BIT FIRST

Get that wonderful second Cover Disk in the drive and open up the STOS folder. You can run *STOS* straight from the Cover Disk by running *BASIC206.PR* and loading in the example games. In order to fit the complete package on the Disk for you, however, we've had to compact all Accessories and example memory bank files into two self-extracting programs. If you want to get into programming and use all the extras, you need to make a backup of the Cover Disk and decompress all the extra goodies that you can find there.

First write-protect the Cover Disk – that is, move the little black tab so you can see through the hole. Nothing can now be written to or deleted from the Disk. Open the STOS folder and copy the file *STOS1.TOS* onto a new formatted disk. Now double-click on the program on this new disk to run it and it decompacts itself into a mass of files. Now delete *STOS1.TOS* from your new disk to leave room for the next batch of files, or else you could use another blank disk and copy *STOS2.TOS* to it. Now run *STOS2.TOS* and you get another mass of files. You can then delete *STOS2.TOS* from your copy. This new disk now has all the extras that come with *STOS* including the sprite, music, font, icon and map designers. Now take another blank formatted disk and copy all the other files from the STOS folder on the Cover Disk – this is your language disk. Don't, whatever you do, delete anything from the original Cover Disk itself. You wouldn't do anything drastic like that, would you? No, thought not.

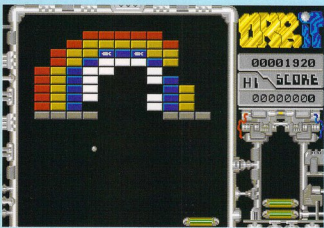
Since its release *STOS Basic* has been a roaring success, putting serious programming within reach of us ordinary mortals. It's a language designed to produce games but can turn its hand to anything you fancy. There are over 320 powerful commands that give you an amazing amount of control over your ST with only a few lines of code – stuff which would require realms of wibble using any other language.

On the Cover Disk is the complete thing, nothing taken away. In order to squish it all on we've had to compact a few things, although the language itself and the example games are ready to roll. Open up the STOS folder and run *BASIC206.PR*. Press <F4> to load in a BASIC listing. Click on either the *ORBIT* or *ZOLTAR* folder and select the



● Press the <Help> key to reach this memory screen. *STOS* can hold up to four full programs in memory at once – use the cursor up and down arrows to switch between them. This screen also gives you access to the Accessories from the list at the bottom using the Function keys.

relevant BAS files, then click on Return or hit the <Return> key on the keyboard and in it loads. Type in *run* or press <F6> and you're in action. Impressed? You should be. Before you



● *Orbit* – one of the two fabby example games that come with *STOS*. It's our old favourite the bat and ball job, and it comes with a few extras like tiles, as well as a myriad of special effects and a complete level editor. Good one.

go on, it's best to make a fully working back-up in case you spill coffee on the Disk, it falls on the floor and gets trodden on before it somehow it gets accidentally thrown out of the window and the cat runs off with it. It's easy with Back-Up – see page 7.

When you first load *STOS* you find yourself in the Editor window. It's here that you type in your programs or enter direct commands. Along the top of the screen is a bar with the function key shortcuts. Pressing <Shift> brings up another set of shortcuts. You can configure the Editor setup by loading and running *CONFIG.BAS*. As with most BASICS, you enter programs by typing in a line number first and then the commands – you can use any number you like but they get executed in strict order. Commands typed in without a line number first are called direct commands and are executed straight away.

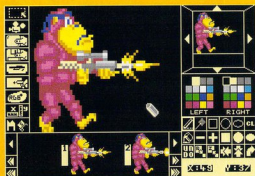
STOS has several unique features, including these things called memory banks – sections of memory used to store data, which can be anything from pictures to music. You've got 15 at your disposal – the command *list* – bank gives you the lowdown on the contents. This means there's no mucking about loading in graphics before you can use them – they're already in memory and hot to trot.

There's so much to the *STOS* language that we can't possibly go through all the sexy(?) commands here. On page 43 we've got a rather special offer involving the full spiral bound 280-page manual – and the *STOS Maestro Plus* sampling cartridge! Then check out our tutorial series starting next month. We'll have you programming stunning games, swooping demos, rousing sampled symphonies and marvellous utilities before you know it, probably.

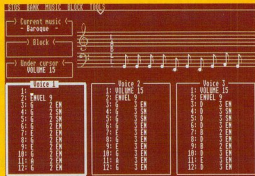
DON'T MISS THE SPECIAL STOS MANUAL OFFER ON PAGE 43

OPTIONAL ACCESSORIES

Another of the STOS specials is the Accessories, which work much like regular ST Desk Accessories, sitting in memory waiting to be used. STOS comes with 16 as standard and you can easily write your own. There are powerful designers for your sprites, music, fonts – even one that creates maps for you. They are loaded in using the `load "name here.ACB" command`, using the appropriate Accessory name. You can run them at any time by pressing <Help> and one of the Function keys. There are plenty of example data files to load in and experiment with. The `addnew` command zaps all the Accessories from memory.



● Here you are with the powerful sprite editor in action. You can design and check the animation before saving the sprites straight into your program's memory bank.



● The music Accessory gives you control over your ST's three sound channels. You can load in and listen to sample tunes. Each memory bank of music can hold 31 pieces of music.

MY FIRST PROGRAM

Like learning any language, learning STOS is not going to happen overnight. It is however a damn sight easier to learn than just about any other programming language, probably. Once you've got your working backup ready, load up STOS, insert the disk with your MBK files on it, and try out this little listing we just happen to have prepared earlier.

```
10 mode 0 : key off : cure off : hide
20 load "sgdemo.mbk",1: Y=2
25 load "music.mbk",3
30 palette $0,$777,$7,$6,$5,$4,$3,$2,$1
40 for X=180 to 0 step -10 : ink Y
50 circle 160,100,X
60 Y=Y+1 : if Y=8 then Y=2
```

```
70 next X
75 music 1: music on
80 sprite 1,0,0,3
90 move x 1,"(3,2,125)(3,-2,125)"
100 move y 1,"(3,2,85)(3,-2,85)"
110 move on : wait key-end
```

Not completely mindblowing, but damn good considering the amount of code. STOS has automatically created the correct interrupt to move the sprite and play the music without you having to dip into the nightmare of Operating System calls or vector trapping. Try doing this in any other language and it would take masses of impenetrable code. What a powerful language it is – the game creator indeed! Now get creating.

VARIABLES

Programs use variables to store data – for example, you could use the line `X=12` to store the value 12 in the variable X. Later on you could do the sum `X+X=Y`. You would end up with the value 24 stored in the variable Y. You can call variables anything you like, as long as it's not an existing command word. By default STOS uses whole numbers. To use real numbers – that is, (with decimal points) – add the symbol # to the end of the variable name, as in `B#2.569`. Strings of characters are suffixed with a \$, like this: `Y$="Zaphod Beeblebrox"`.

Animaster

One thing that can lift a good program into the realms of excellence is a well-animated sprite – that chap in *Prince of Persia* running and leaping about, or the marvellous death scenes from *Immortal*, for instance. Animaster is a powerful tool for helping you create the little beasts ready to be whacked straight into your GFA Basic programs and animated. You can create sprites up to 128 pixels square and as many of them as memory permits. Animaster can automatically create the mask files that GFA Basic needs to display them correctly over the top of a background. A mass of clever tools make the whole process as easy as it's likely to get. Animations are created as a series of frames, which can be edited, copied, deleted, flipped, scrolled and a host of other flashy things. There's even a comprehensive test bed for checking out your animations before you start coding them into your masterpieces. And of course we don't need to remind you that GFA Basic 3.5 – the latest, fastest version of GFA Basic there is – was yours complete with STF 35. If you missed that, turn to page 40.



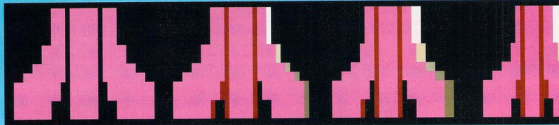
● To get a real feel of how things are going to look in your programs, Animaster enables you to animate your sprites over a background and check out how they look.

READ ME FIRST

You can run Animaster straight from the Cover Disk if you wish, but because we want to squash as much as possible on the Cover Disks we've compacted all but one of the example files. Open the ANIMASTR folder and copy all the contents to a blank formatted disk. Run the program EXAMPLES.TOS. The disk

whirls away for a minute and you then find a host of examples and full source code for using Animaster sprites in your own GFA Basic programs. If you haven't got GFA Basic then you missed STF 35, where we gave away the complete and working package – turn to page 40 quick.

● The main event – animating a series of sprites. On the Cover Disk you can find this animation of a spinning Atari logo. Click on Load and select SPIN.ASB. Then just click on Animate and select Loop and then Play. Bingo! Instant animation.



THE STUDIO FLOOR

Animaster's main screen - from here all the juicy functions are within mouse reach

Sprite window - the sprite you're working on in real size. Move the mouse over it and a box appears. This is the magnified section that appears in the edit window. You can draw fresh by holding down the left mouse button. Clicking with the right mouse button "locks" the position of the edit screen, and clicking again releases it. You can alter the sprite size using the cursor keys - remember that this affects all the loaded sprites.

Load picture - click on this number to load in a picture to use as a backdrop for your animations or to cut sprite frames out of. Animaster can load P11, PC1, NEO, IFF, ART format pictures and screens created using GFA Basic's Get command. After you select what you want the screen for, a box pops up to select the file type, and then you get the file selector to load in your graphic. There's an example called SHIP.P11 on the Disk. The last option is to use either the picture's palette or the existing one - remember that black and white never change. If you're cutting out frames a little box appears over the picture, and you can realize this using the cursor keys. Just click over the section you want. If you select Auto after grabbing a frame Animaster cuts out frames across and down in a grid fashion.

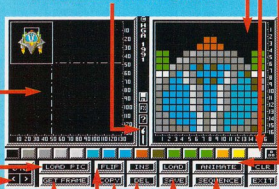
Frame control - shows the current frame number of the sprite being edited. Click on the arrows to move through the sprites. The right mouse button moves in steps of five. If you go past the last frame you're asked if you want to create a new empty frame. To enter the frame number directly, click on the current number and type him in.

Flip - from here you can flip the frames vertically or horizontally or scroll the sprite within the frame. The little button with a cross in it centres the sprite in the frame. To move a sprite around, you need areas of black around it. Click on Undo to get everything as it was if you've made a blunder. If your ST has a blitter chip fitted you can turn the little blitter on and off from here as well.

Copy - click and up pops a boxette enabling you to copy any frame to any frame. You set the source frame - the frame you're copying from - and the destination frame - the frame you're copying to - by clicking on the numbers. The left button increases the value; the right one decreases it. Selecting Over completely replaces

Edit window - a 16-pixel square enlargement of part of your sprite. The left mouse button edits the sprite, and the sprite in the sprite window is updated as you draw. The right mouse button grabs a colour - just click on the colour you want to draw with and it's automatically selected.

Paintbox - click here to bring up the painting tools. As well as the basic pen which draws one pixel at a time there are lines, filled and unfilled boxes and circles, fill, airbrush and copy. Hold down the mouse button and drag to define the areas. If you make a horrible mistake click on Undo or Ctr to zap the entire edit window. Select Exit when you're done.



Get frame - once you've loaded in a picture, click on here to grab more frames from it.

Load and Save - click on these to load or save the sprite files. These are saved with filenames ending in .ASB. There are a few on the Disk for you to take a look at. If there is enough memory you're asked if you want to save the sprite mask files as well. You need these to use the sprites in your own GFA Basic programs. If there isn't enough memory you can use the separate program CONVERT.PRGM on the Disk to produce them for you when you want to use the sprites in a program.

Insert - Inserts a frame at the current position. All frames after this are moved one forward. **Delete** - you can delete the current frame or all of them. If you zap one all the subsequent frames move back to fill the gap.

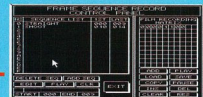
the destination frame with the source one; Merge puts the new frame on top of the old one. Copy can also use a buffer to temporarily store a frame - useful for copying frames between files because the buffer is safe from deletion. When the frame number is at zero, click once with the right button to select the buffer.



Colour palette - just click on one of the 16 colours to draw with it. To change a colour, select the box with the three dots at the right and up pops a box with colour sliders. Each colour is made up from red, green and blue. Click on the sliders or the arrows to either side to change the values. For ordinary STs the numbers range from 0 to 7, giving a palette of 512 colours. STEs use numbers from 0 to 15, giving a grand total of 4,096 available colours.



Animation - now it's starting to get interesting. This enables you to animate your frames. If you select Background the animation gets displayed over your loaded backdrop. Select Loop and the sequence is played over and over - click with the right mouse button to exit. Reverse displays the frames in reverse order. You set the start and end frames with the mouse: the left button increases the number, the right one decreases it. The animation delay is the time each frame is on screen for. Once it's all set up, click on Play and off you go. As usual the right button exits.



Sequence - the best bit, this - it takes the hard work out of testing animation sequences. You can define a series of animation sequences, each with its own start and end frames. Click on Load and watch in the example file called SHIP.SEQ on the Disk to go with the SHIP.ASB sprites. You've got two sequences in the sequence list box, with different start and end frames. The buttons below this enable you to add, delete, edit and clear the sequences. To play a sequence click on Play and select one from the list. To add one click on Add Seq, use the keyboard to enter a suitable name and tap in the start and end frames. On the left is the film recording matrix. This stores a series of sequences. Click on Play to see the example series. To add a sequence select a box and click on Add, then choose a sequence from the sequence list. Delete zaps the current box and Insert adds a pause, the other sequences shuffling around to suit. To copy a sequence select the source, click on Copy and then click on the destination square. Follow the same procedure but click on Swap and the contents of the two positions are swapped. Clear zaps your film from memory. Load and Save do just what they say with your sequence files - these are saved with the filename extension SEQ.

GET EVEN MORE FROM ANIMASTER - TURN TO PAGE 43 NOW!

and all the adverts for external drives all seem to function as Drive B, without a through-port.

Jon-Scott A Allen, Caithness

I have a 520 ST with external drives A and B. The problem is that my old Atari drive no longer works and I cannot get a replacement mechanism for it. While your magazine is very good with regard to upgrading internal drives, you have never mentioned the problem I am having. Do you have any suggestions?

Barry Aldous, Suffolk

stf: Ladbroke Computing Ltd can supply the Golden Image 3.5 inch Floppy Disk Drive for £69.99. The drive includes a throughput and digital track counter. Phone Ladbroke on 0772 203166.

COME BLOW YOUR HORN



Is it still possible to obtain the Casio Digital Horn and can it be connected to the STE?

A Harland, N Humberstone

stf: The Casio Digital Horn is a MIDI controller operated by lip pressure – it resembles a miniature sax, but is made of silver-coloured plastic. This is no longer manufactured, so your best bet is to look in music magazines or to telephone music shops to see if they have any left in stock. It connects to the MIDI In port of any of the ST range and can be used to input MIDI information to any ST sequencer in the same way as a keyboard is normally used.

CAN'T HEAR FOR THE NOISE



When using Sequencer One given away on STF Cover Disk 30, I get so much distortion that I am unable to hear the music. My friend has the same prob-



STOS Surgery

STOS is yours, complete, with this issue of **STF**, and this is the place to write with your queries. Here's another batch answered by Asa Burrows

SAMPLE THIS

Please could you tell me if there is any way I can play samples in **STOS** Basic programs? The sampler I use saves samples with the .SAM file extension.

Andrew Lear, Cheshire

stf: If you have a sampler and you wish to play samples back within a **STOS** program you should check the sampler's manual thoroughly or check if there is a document file on the disk with the word **STOS** as part of the filename. Most samplers are provided with playback routines for all the popular programming languages, including **STOS**. You do not indicate which sampler you have, although both the **Mastersound** and the **STOS Maestro** samplers save files with the .SAM extension. On **Cover Disk 29** we included the **Sconvert** program, which can convert sound samples between different formats.



READERS' TIPS SPECTRE TIP

M Laurretta from London N7 has sent in details of converting ST-generated MacPaint files for use with the Spectre GCR Mac emulator or on a Mac.

For some reason files saved in MacPaint format from an ST package do not work on the Mac emulator, but there is a way around this.

- 1 Save your pictures in IMG format onto a PC disk.
- 2 Use the Graphic Workshop Shareware program on a PC or a PC emulator to convert the file to MacPaint format and re-save to the floppy.
- 3 Use the Transverter program supplied with Spectre GCR to copy the file to an MFS format Spectre disk.
- 4 When the disk is used in Spectre or on a Mac it now has the correct icon and works perfectly.

lem. Is the Disk faulty or are we missing something?

**L Black, Edmonton, London
and R Hammond, Walsall, West Midlands**

stf: I assume that you are talking about the playback quality of the .IFF samples which you load into the palette. The result is rather noisy – the answer is to upgrade to Sequencer One Plus (Gajits # 061 236 2515) on which this particular feature has been greatly improved.



COST OF COMMS

How much does it cost to run a modem? Is it the same rates as a normal telephone call? Is it cheaper after 6pm and at weekends?

Daryl Lay, Suffolk

stf: Once you have paid for the modem and your comms software, all further charges are made at BT's normal rates because the modem

is plugged into a standard telephone socket. Some services such as CIX and CompuServe, however, charge you for time on-line to the service, and payment is usually made quarterly for actual time on-line plus a standing charge.



SCROLL ON

When I 'show' a document from the Desktop in either medium or low resolution I seem to lose lines of text when I scroll the screen. I have a 520 STE.

Kevin Garrad, Avon

stf: This problem occurs on the STE or on machines with TOS 1.4 if the screen is scrolled by pressing the left mouse button. This scrolls the screen up by 27 lines instead of 25 lines. If you press <Space> to scroll the screen it performs the scroll correctly.



WEIRD TRIP

I have been told about a program called Trip-a-Tron by a friend, who said it was a light synthesizer. What does this mean and where can I get it from?

C Gasper, Ewhurst

stf: Trip-a-Tron is another masterpiece from Jeff Minter, he of Llamatron fame (STF Cover Disk 24), not to mention Revenge of the Mutant Camels (Cover Disk 31). The program is designed to produce a 'light show' on-screen, the visual equivalent of a piece of music. It consists of a suite of subprograms enabling you to set up sequences of events, program different parameters to produce effects of your own designs, trigger events from a MIDI keyboard and a video sequencer, giving you control over the screen and enabling you to perform all sorts of TV style special effects. The more advanced features need 1MByte of RAM, although the

PLEASE DELETE ME

How can I delete a command or an entire line within **STOS**? When I have finished writing a game I always find I have made a mistake with some lines.

Darren Vine, Devon

stf: If you wish to delete a command from within a line all you have to do is LIST the line in question, like this:

LIST 20 <ENTER>

Now by using the cursor keys move the flashing cursor over the command and press the <Delete> key to delete each character of the word. Then press <Enter> to register the line.

If you wish to remove a line from a program then simply type in the number of the line you wish to delete and then press the <Enter> key: 20 <ENTER>

TRAPPED

I've tried using the TRAP #6 floating point extension library to create moving images of fractals, but I don't know whether the descriptions in the manual are relevant to this latest version of **STOS** 1.62. Mandarin

couldn't tell me and even though I seem to have got TRAP #6 working – not crashing – I don't understand the result I am getting because it seems to be in some special format.

Simon Alexander, Brixton

stf: The manual is not relevant to **STOS** 1.62 – nor to any version of **STOS** because the TRAP #6 and TRAP #4 routines were removed before **STOS** was released because they slowed **STOS** down.

MEMORY

Is there any way I can reserve more memory for the sprite bank (I? I am writing a game with a great deal of animation and cannot define enough animation frames with the standard bank size. The program only allows me 66 frames of 32x32 pixels or 17 frames of 64x64 pixels. All frames must be available at once without loading and saving memory banks.

Lee Davison, Essex

stf: You are probably going to be unable to have that many animation frames, although you

basic program runs on a bog-standard 520 ST. Trip-a-Tron costs £34.95 from Llamasoft = 0734 814478.

MOVIE MOGUL IN WAITING



I am interested in producing amateur video films and I need a decent video titling program and a text scroll program. Do you know where I could get them from?

Fred Olen Grey, Hammersmith

stf: In STF 35 we reviewed Video Titler ST v2 (£34.95) from Laser Distribution and awarded it a rating of 79%. Contact Laser on = 0579 82426 for details. Alternatively you could try the Video Master disk from Bugdie Productivity Software. It is available on disk GPR020 from Goodmans International and will set you back £3.95. Call Goodmans on = 0782 335650.

MONITOR MAYHEM



I have an opportunity to purchase a Fujitsu M3 503B monitor. Can I use it with my STE? If so where can I purchase a cable?

Jim Rodger, Stowmarket

stf: Without more details of the monitor we cannot give precise details on connection. If the monitor is an RGB type then it may work with your machine. Generally PC monitors cannot be used with an ST or STE without internal modifications to the monitor. There are hundreds of different brands of PC monitor available, and each one is likely to require different modifications. That said, any competent TV service engineer should be able to connect the two. Contact Meedmore (= 051 5212202) and give them full details of your monitor – they are lead specialists and should be able to offer you a solution.

could try this: load your sprites and then save them using the BSAVE command. Clear memory and then reserve a bank with the amount of memory you require for the sprite file. Then try loading the sprite bank into it using the BLOAD command.

STOS NOVICE

In STF 32 you gave a STOS extension free on the Cover Disk and the instructions in the magazine said that you have to put the files into the compiler folder, but I have only got STOS, ORBIT and ZOLTAR folders. What do I do and what does STOS stand for anyhow?

John Dunsmore, Ayrshire

stf: When you are installing a STOS extension the files you need to copy onto your disks are either FILENAME.EX? or FILENAME.EC? The questionmarks can be any legal character. Where you have an .EX file this has to be put into the STOS folder on the language disk, while .EC files have to be put into the COMPILER folder on the compiler disk. If you don't have the STOS Compiler then you don't have to worry



Delve into disk data

IS IT SAFE?

I have an STE with an external floppy drive. Both my drives can format to 84 tracks and 11 sectors, not just the normal 80 tracks and 9 sectors. How far is it safe to format a disk?

W Hart, Mid-Glamorgan

Usually a disk should not be formatted beyond 80 tracks and 10 sectors because a normal double density disk is only designed to accommodate these parameters. However most good branded disks can happily format to 82 tracks and 10 sectors. To format a disk beyond these levels is risking data loss or corruption.

DATA DILEMMA

When I try to copy files or make backup disks I am often presented with the message "Data on disk A may be dam-

aged. You must use the right kind of floppy disk or connect your hard disk correctly." What is going wrong? I don't have a hard drive with my ST.

Simon Mower, Norfolk

Do you have problems loading your games? If you don't then this message usually means that the floppy disk you are trying to copy has become corrupted in some way, but there is a chance that there may be a problem with your disk drive itself. Try formatting a new branded blank disk (in other words, not a cheap one – cheapies often prove to be a false economy for this very reason). If it formats without any problem then your drive is probably okay. If you do get the message while formatting then your drive may be at fault. Call the ST FORMAT Soup Up and repair service on = 0480 890787 and they will quote you a price for the repair. Remember though that you cannot copy commercial games disks – they give this error if you try.

WHICH IS BETTER?



Which is the better printer, Canon's BJ-10ex or the new Star SJ-48? The prices are similar but what about the output?

Niall Moran, Argyll

stf: Both the Star and the Canon printers use the same mechanism, so the output is virtually identical. Both printers can be obtained from We Serve (= 0705 325354) by mail order, the Star SJ-48 for £229.00 and the Canon BJ-10ex for £235.00. Both printers are supplied with cable and paper included.

SPLIT PERSONALITY



I have bought a lead to connect my Hewlett Packard colour monitor to my STFM. All the colours are okay in both medium and low resolution but the

icons appear down the middle of the screen and the picture runs off the right-hand side of the screen and reappears on the left-hand side. Does this mean I cannot use this monitor?

Frank Cullen, Sussex

stf: It sounds as though the horizontal sync needs adjusting – that is if it is connected at all. Lug the monitor and your ST to a TV repair shop and they should be able to sort it out for you.

TOS UPGRADE WANTED



I have a 1040 STE. Is there any chance of obtaining the new Mega STE TOS for my machine?

Carl Brown, Suffolk

stf: A switchable TOS 2.06 upgrade is available

about the .EC file. Simply copy the .EX file into the STOS folder on your language disk.

Sometimes there may only be an .EX file supplied with a STOS extension. In this case you need only copy it into the STOS folder. In these cases, you will be unable to compile any programs which use the new extension. STOS stands for ST Operating System.

NON-COMPATIBILITY

I have STOS v2.5 which I use with a Mega ST. The programs I create with it do not seem to be STE compatible. What can I do to rectify this?

Tim Putnam, Dorset

stf: Your problem is simply that STOS 2.5 is not compatible with the STE version of the ST operating system, TOS 1.62. There is a conversion program available for £2.75 from Goodman International Shareware (= 0782 335650) on disk GD489 – but the complete latest version, v2.6, is yours with this issue of STF anyway! Also included on our Disk is a handy little program called CONVERT.BAS, for converting your

programs from early versions of STOS to version 2.6.

ANOTHER OLD VERSION

STOS loads fine on my 520STFM upgraded to 1MByte of RAM but not on my friend's STE 520 – it bombs out on loading. I am using STOS version 1.03. I also have the STOS Game Maker's Manual, and on page 21 there is a Sprite Experimenter program. I have typed in the listing only to find that when I run it there is a movement declaration error in line 70. Could you please help? I have written to the author of the book and received no reply.

J Goodman, Plymouth

stf: You are unable to use your version of STOS on your friend's machine because you have an old version of the program. You can solve the problem by using version 2.6, the version that's yours with this issue of STF. The sprite program does work, but you need to type in the parameters for horizontal and vertical movement in exactly the same way as you would for using the MOVE command in a program.

Getting the program

Don't look but now but here comes a programming tutorial - it's no good hiding, it's seen you and is coming over for a chat. Quick! Run away before you get caught along with Chris Lloyd in the fascinating undersea world of STOS Basic

Computer programming is easy - oh, alright not all that easy but it's a darn sight simpler than you might think. All a program consists of is a series of instructions which are carried out one by one. In the heart of your ST these instructions are in binary - there are masses of 0s and 1s which aren't exactly simple to use but they're all your ST can understand. To ease the strain on these two keys and make programming possible for those of us who think in colour rather than black and white there are computer languages. These convert the computer's language into something that you can use.

Step forward STOS, a brilliant and powerful language that puts you quickly and easily into the driving seat. Even better - it was yours with last month's ST FORMAT. If you had your head in a bucket last month and missed it, turn to page 40 and order yourself a copy - you know it makes sense. Armed with STOS, some patience, imagination and hot coffee, the world of programming opens up - games, demos, applications - anything that takes your fancy. BASIC has never been so powerful or so easy.

STOS is an interpreter - that is, it takes one command, converts it into something your ST understands, then executes it and moves on to the next one. Programs are typed into the editor as a series of lines, each with a number. Each line can hold a number of commands separated by a colon and are executed in numerical order. Commands typed in without a line number are executed directly - these are called direct commands. Got all that? Right then, let's get coding.

PUTTING THINGS IN THE PICTURE

One of the more seriously impressive feathers in STOS's cap is the graphics handling capacity. Getting graphics from your art package and into STOS ready to be manipulated in various strange and wonderful ways is a piece of cake. You don't have to muck about allocating memory and examining file headers to extract the palette - STOS does all that for you. You can load Neochrome or Degas Elite pictures straight into one of STOS's memory banks. You can have up to 15 of these areas of memory holding any kind of data you like. To load a picture into your STOS program, you need to reserve a bank. Entering the direct command - reserve as datascreen 6 - reserves bank 6 for a picture which is to be saved

```
f1: list f2: list f3: listbank f4: flood"*.ba f5: fsave"*.ba
f6: run f7: dir f8: dir=> dir f9: previous f10: off

2 rem
3 rem
4 rem
5 rem
6 rem
7 rem
8 rem
9 rem
10 rem
11 rem
12 rem
13 rem
14 rem
15 rem
16 rem
17 rem
18 rem
19 rem
20 rem
21 rem
22 rem
23 rem
24 rem
25 rem
26 rem
27 rem
28 rem
29 rem
30 rem
31 rem
32 rem
33 rem
34 rem
35 rem
36 rem
37 rem
38 rem
39 rem
40 rem
41 rem
42 rem
43 rem
44 rem
45 rem
46 rem
47 rem
48 rem
49 rem
50 rem
51 rem
52 rem
53 rem
54 rem
55 rem
56 rem
57 rem
58 rem
59 rem
60 rem
61 rem
62 rem
63 rem
64 rem
65 rem
66 rem
67 rem
68 rem
69 rem
70 rem
71 rem
72 rem
73 rem
74 rem
75 rem
76 rem
77 rem
78 rem
79 rem
80 rem
81 rem
82 rem
83 rem
84 rem
85 rem
86 rem
87 rem
88 rem
89 rem
90 rem
91 rem
92 rem
93 rem
94 rem
95 rem
96 rem
97 rem
98 rem
99 rem
100 rem
101 rem
102 rem
103 rem
104 rem
105 rem
106 rem
107 rem
108 rem
109 rem
110 rem
111 rem
112 rem
113 rem
114 rem
115 rem
116 rem
117 rem
118 rem
119 rem
120 rem
121 rem
122 rem
123 rem
124 rem
125 rem
126 rem
127 rem
128 rem
129 rem
130 rem
131 rem
132 rem
133 rem
134 rem
135 rem
136 rem
137 rem
138 rem
139 rem
140 rem
141 rem
142 rem
143 rem
144 rem
145 rem
146 rem
147 rem
148 rem
149 rem
150 rem
151 rem
152 rem
153 rem
154 rem
155 rem
156 rem
157 rem
158 rem
159 rem
160 rem
161 rem
162 rem
163 rem
164 rem
165 rem
166 rem
167 rem
168 rem
169 rem
170 rem
171 rem
172 rem
173 rem
174 rem
175 rem
176 rem
177 rem
178 rem
179 rem
180 rem
181 rem
182 rem
183 rem
184 rem
185 rem
186 rem
187 rem
188 rem
189 rem
190 rem
191 rem
192 rem
193 rem
194 rem
195 rem
196 rem
197 rem
198 rem
199 rem
200 rem
201 rem
202 rem
203 rem
204 rem
205 rem
206 rem
207 rem
208 rem
209 rem
210 rem
211 rem
212 rem
213 rem
214 rem
215 rem
216 rem
217 rem
218 rem
219 rem
220 rem
221 rem
222 rem
223 rem
224 rem
225 rem
226 rem
227 rem
228 rem
229 rem
230 rem
231 rem
232 rem
233 rem
234 rem
235 rem
236 rem
237 rem
238 rem
239 rem
240 rem
241 rem
242 rem
243 rem
244 rem
245 rem
246 rem
247 rem
248 rem
249 rem
250 rem
251 rem
252 rem
253 rem
254 rem
255 rem
256 rem
257 rem
258 rem
259 rem
260 rem
261 rem
262 rem
263 rem
264 rem
265 rem
266 rem
267 rem
268 rem
269 rem
270 rem
271 rem
272 rem
273 rem
274 rem
275 rem
276 rem
277 rem
278 rem
279 rem
280 rem
281 rem
282 rem
283 rem
284 rem
285 rem
286 rem
287 rem
288 rem
289 rem
290 rem
291 rem
292 rem
293 rem
294 rem
295 rem
296 rem
297 rem
298 rem
299 rem
300 rem
301 rem
302 rem
303 rem
304 rem
305 rem
306 rem
307 rem
308 rem
309 rem
310 rem
311 rem
312 rem
313 rem
314 rem
315 rem
316 rem
317 rem
318 rem
319 rem
320 rem
321 rem
322 rem
323 rem
324 rem
325 rem
326 rem
327 rem
328 rem
329 rem
330 rem
331 rem
332 rem
333 rem
334 rem
335 rem
336 rem
337 rem
338 rem
339 rem
340 rem
341 rem
342 rem
343 rem
344 rem
345 rem
346 rem
347 rem
348 rem
349 rem
350 rem
351 rem
352 rem
353 rem
354 rem
355 rem
356 rem
357 rem
358 rem
359 rem
360 rem
361 rem
362 rem
363 rem
364 rem
365 rem
366 rem
367 rem
368 rem
369 rem
370 rem
371 rem
372 rem
373 rem
374 rem
375 rem
376 rem
377 rem
378 rem
379 rem
380 rem
381 rem
382 rem
383 rem
384 rem
385 rem
386 rem
387 rem
388 rem
389 rem
390 rem
391 rem
392 rem
393 rem
394 rem
395 rem
396 rem
397 rem
398 rem
399 rem
400 rem
401 rem
402 rem
403 rem
404 rem
405 rem
406 rem
407 rem
408 rem
409 rem
410 rem
411 rem
412 rem
413 rem
414 rem
415 rem
416 rem
417 rem
418 rem
419 rem
420 rem
421 rem
422 rem
423 rem
424 rem
425 rem
426 rem
427 rem
428 rem
429 rem
430 rem
431 rem
432 rem
433 rem
434 rem
435 rem
436 rem
437 rem
438 rem
439 rem
440 rem
441 rem
442 rem
443 rem
444 rem
445 rem
446 rem
447 rem
448 rem
449 rem
450 rem
451 rem
452 rem
453 rem
454 rem
455 rem
456 rem
457 rem
458 rem
459 rem
460 rem
461 rem
462 rem
463 rem
464 rem
465 rem
466 rem
467 rem
468 rem
469 rem
470 rem
471 rem
472 rem
473 rem
474 rem
475 rem
476 rem
477 rem
478 rem
479 rem
480 rem
481 rem
482 rem
483 rem
484 rem
485 rem
486 rem
487 rem
488 rem
489 rem
490 rem
491 rem
492 rem
493 rem
494 rem
495 rem
496 rem
497 rem
498 rem
499 rem
500 rem
501 rem
502 rem
503 rem
504 rem
505 rem
506 rem
507 rem
508 rem
509 rem
510 rem
511 rem
512 rem
513 rem
514 rem
515 rem
516 rem
517 rem
518 rem
519 rem
520 rem
521 rem
522 rem
523 rem
524 rem
525 rem
526 rem
527 rem
528 rem
529 rem
530 rem
531 rem
532 rem
533 rem
534 rem
535 rem
536 rem
537 rem
538 rem
539 rem
540 rem
541 rem
542 rem
543 rem
544 rem
545 rem
546 rem
547 rem
548 rem
549 rem
550 rem
551 rem
552 rem
553 rem
554 rem
555 rem
556 rem
557 rem
558 rem
559 rem
560 rem
561 rem
562 rem
563 rem
564 rem
565 rem
566 rem
567 rem
568 rem
569 rem
570 rem
571 rem
572 rem
573 rem
574 rem
575 rem
576 rem
577 rem
578 rem
579 rem
580 rem
581 rem
582 rem
583 rem
584 rem
585 rem
586 rem
587 rem
588 rem
589 rem
590 rem
591 rem
592 rem
593 rem
594 rem
595 rem
596 rem
597 rem
598 rem
599 rem
600 rem
601 rem
602 rem
603 rem
604 rem
605 rem
606 rem
607 rem
608 rem
609 rem
610 rem
611 rem
612 rem
613 rem
614 rem
615 rem
616 rem
617 rem
618 rem
619 rem
620 rem
621 rem
622 rem
623 rem
624 rem
625 rem
626 rem
627 rem
628 rem
629 rem
630 rem
631 rem
632 rem
633 rem
634 rem
635 rem
636 rem
637 rem
638 rem
639 rem
640 rem
641 rem
642 rem
643 rem
644 rem
645 rem
646 rem
647 rem
648 rem
649 rem
650 rem
651 rem
652 rem
653 rem
654 rem
655 rem
656 rem
657 rem
658 rem
659 rem
660 rem
661 rem
662 rem
663 rem
664 rem
665 rem
666 rem
667 rem
668 rem
669 rem
670 rem
671 rem
672 rem
673 rem
674 rem
675 rem
676 rem
677 rem
678 rem
679 rem
680 rem
681 rem
682 rem
683 rem
684 rem
685 rem
686 rem
687 rem
688 rem
689 rem
690 rem
691 rem
692 rem
693 rem
694 rem
695 rem
696 rem
697 rem
698 rem
699 rem
700 rem
701 rem
702 rem
703 rem
704 rem
705 rem
706 rem
707 rem
708 rem
709 rem
710 rem
711 rem
712 rem
713 rem
714 rem
715 rem
716 rem
717 rem
718 rem
719 rem
720 rem
721 rem
722 rem
723 rem
724 rem
725 rem
726 rem
727 rem
728 rem
729 rem
730 rem
731 rem
732 rem
733 rem
734 rem
735 rem
736 rem
737 rem
738 rem
739 rem
740 rem
741 rem
742 rem
743 rem
744 rem
745 rem
746 rem
747 rem
748 rem
749 rem
750 rem
751 rem
752 rem
753 rem
754 rem
755 rem
756 rem
757 rem
758 rem
759 rem
760 rem
761 rem
762 rem
763 rem
764 rem
765 rem
766 rem
767 rem
768 rem
769 rem
770 rem
771 rem
772 rem
773 rem
774 rem
775 rem
776 rem
777 rem
778 rem
779 rem
780 rem
781 rem
782 rem
783 rem
784 rem
785 rem
786 rem
787 rem
788 rem
789 rem
790 rem
791 rem
792 rem
793 rem
794 rem
795 rem
796 rem
797 rem
798 rem
799 rem
800 rem
801 rem
802 rem
803 rem
804 rem
805 rem
806 rem
807 rem
808 rem
809 rem
810 rem
811 rem
812 rem
813 rem
814 rem
815 rem
816 rem
817 rem
818 rem
819 rem
820 rem
821 rem
822 rem
823 rem
824 rem
825 rem
826 rem
827 rem
828 rem
829 rem
830 rem
831 rem
832 rem
833 rem
834 rem
835 rem
836 rem
837 rem
838 rem
839 rem
840 rem
841 rem
842 rem
843 rem
844 rem
845 rem
846 rem
847 rem
848 rem
849 rem
850 rem
851 rem
852 rem
853 rem
854 rem
855 rem
856 rem
857 rem
858 rem
859 rem
860 rem
861 rem
862 rem
863 rem
864 rem
865 rem
866 rem
867 rem
868 rem
869 rem
870 rem
871 rem
872 rem
873 rem
874 rem
875 rem
876 rem
877 rem
878 rem
879 rem
880 rem
881 rem
882 rem
883 rem
884 rem
885 rem
886 rem
887 rem
888 rem
889 rem
890 rem
891 rem
892 rem
893 rem
894 rem
895 rem
896 rem
897 rem
898 rem
899 rem
900 rem
901 rem
902 rem
903 rem
904 rem
905 rem
906 rem
907 rem
908 rem
909 rem
910 rem
911 rem
912 rem
913 rem
914 rem
915 rem
916 rem
917 rem
918 rem
919 rem
920 rem
921 rem
922 rem
923 rem
924 rem
925 rem
926 rem
927 rem
928 rem
929 rem
930 rem
931 rem
932 rem
933 rem
934 rem
935 rem
936 rem
937 rem
938 rem
939 rem
940 rem
941 rem
942 rem
943 rem
944 rem
945 rem
946 rem
947 rem
948 rem
949 rem
950 rem
951 rem
952 rem
953 rem
954 rem
955 rem
956 rem
957 rem
958 rem
959 rem
960 rem
961 rem
962 rem
963 rem
964 rem
965 rem
966 rem
967 rem
968 rem
969 rem
970 rem
971 rem
972 rem
973 rem
974 rem
975 rem
976 rem
977 rem
978 rem
979 rem
980 rem
981 rem
982 rem
983 rem
984 rem
985 rem
986 rem
987 rem
988 rem
989 rem
990 rem
991 rem
992 rem
993 rem
994 rem
995 rem
996 rem
997 rem
998 rem
999 rem
1000 rem
1001 rem
1002 rem
1003 rem
1004 rem
1005 rem
1006 rem
1007 rem
1008 rem
1009 rem
1010 rem
1011 rem
1012 rem
1013 rem
1014 rem
1015 rem
1016 rem
1017 rem
1018 rem
1019 rem
1020 rem
1021 rem
1022 rem
1023 rem
1024 rem
1025 rem
1026 rem
1027 rem
1028 rem
1029 rem
1030 rem
1031 rem
1032 rem
1033 rem
1034 rem
1035 rem
1036 rem
1037 rem
1038 rem
1039 rem
1040 rem
1041 rem
1042 rem
1043 rem
1044 rem
1045 rem
1046 rem
1047 rem
1048 rem
1049 rem
1050 rem
1051 rem
1052 rem
1053 rem
1054 rem
1055 rem
1056 rem
1057 rem
1058 rem
1059 rem
1060 rem
1061 rem
1062 rem
1063 rem
1064 rem
1065 rem
1066 rem
1067 rem
1068 rem
1069 rem
1070 rem
1071 rem
1072 rem
1073 rem
1074 rem
1075 rem
1076 rem
1077 rem
1078 rem
1079 rem
1080 rem
1081 rem
1082 rem
1083 rem
1084 rem
1085 rem
1086 rem
1087 rem
1088 rem
1089 rem
1090 rem
1091 rem
1092 rem
1093 rem
1094 rem
1095 rem
1096 rem
1097 rem
1098 rem
1099 rem
1100 rem
1101 rem
1102 rem
1103 rem
1104 rem
1105 rem
1106 rem
1107 rem
1108 rem
1109 rem
1110 rem
1111 rem
1112 rem
1113 rem
1114 rem
1115 rem
1116 rem
1117 rem
1118 rem
1119 rem
1120 rem
1121 rem
1122 rem
1123 rem
1124 rem
1125 rem
1126 rem
1127 rem
1128 rem
1129 rem
1130 rem
1131 rem
1132 rem
1133 rem
1134 rem
1135 rem
1136 rem
1137 rem
1138 rem
1139 rem
1140 rem
1141 rem
1142 rem
1143 rem
1144 rem
1145 rem
1146 rem
1147 rem
1148 rem
1149 rem
1150 rem
1151 rem
1152 rem
1153 rem
1154 rem
1155 rem
1156 rem
1157 rem
1158 rem
1159 rem
1160 rem
1161 rem
1162 rem
1163 rem
1164 rem
1165 rem
1166 rem
1167 rem
1168 rem
1169 rem
1170 rem
1171 rem
1172 rem
1173 rem
1174 rem
1175 rem
1176 rem
1177 rem
1178 rem
1179 rem
1180 rem
1181 rem
1182 rem
1183 rem
1184 rem
1185 rem
1186 rem
1187 rem
1188 rem
1189 rem
1190 rem
1191 rem
1192 rem
1193 rem
1194 rem
1195 rem
1196 rem
1197 rem
1198 rem
1199 rem
1200 rem
1201 rem
1202 rem
1203 rem
1204 rem
1205 rem
1206 rem
1207 rem
1208 rem
1209 rem
1210 rem
1211 rem
1212 rem
1213 rem
1214 rem
1215 rem
1216 rem
1217 rem
1218 rem
1219 rem
1220 rem
1221 rem
1222 rem
1223 rem
1224 rem
1225 rem
1226 rem
1227 rem
1228 rem
1229 rem
1230 rem
1231 rem
1232 rem
1233 rem
1234 rem
1235 rem
1236 rem
1237 rem
1238 rem
1239 rem
1240 rem
1241 rem
1242 rem
1243 rem
1244 rem
1245 rem
1246 rem
1247 rem
1248 rem
1249 rem
1250 rem
1251 rem
1252 rem
1253 rem
1254 rem
1255 rem
1256 rem
1257 rem
1258 rem
1259 rem
1260 rem
1261 rem
1262 rem
1263 rem
1264 rem
1265 rem
1266 rem
1267 rem
1268 rem
1269 rem
1270 rem
1271 rem
1272 rem
1273 rem
1274 rem
1275 rem
1276 rem
1277 rem
1278 rem
1279 rem
1280 rem
1281 rem
1282 rem
1283 rem
1284 rem
1285 rem
1286 rem
1287 rem
1288 rem
1289 rem
1290 rem
1291 rem
1292 rem
1293 rem
1294 rem
1295 rem
1296 rem
1297 rem
1298 rem
1299 rem
1300 rem
1301 rem
1302 rem
1303 rem
1304 rem
1305 rem
1306 rem
1307 rem
1308 rem
1309 rem
1310 rem
1311 rem
1312 rem
1313 rem
1314 rem
1315 rem
1316 rem
1317 rem
1318 rem
1319 rem
1320 rem
1321 rem
1322 rem
1323 rem
1324 rem
1325 rem
1326 rem
1327 rem
1328 rem
1329 rem
1330 rem
1331 rem
1332 rem
1333 rem
1334 rem
1335 rem
1336 rem
1337 rem
1338 rem
1339 rem
1340 rem
1341 rem
1342 rem
1343 rem
1344 rem
1345 rem
1346 rem
1347 rem
1348 rem
1349 rem
1350 rem
1351 rem
1352 rem
1353 rem
1354 rem
1355 rem
1356 rem
1357 rem
1358 rem
1359 rem
1360 rem
1361 rem
1362 rem
1363 rem
1364 rem
1365 rem
1366 rem
1367 rem
1368 rem
1369 rem
1370 rem
1371 rem
1372 rem
1373 rem
1374 rem
1375 rem
1376 rem
1377 rem
1378 rem
1379 rem
1380 rem
1381 rem
1382 rem
1383 rem
1384 rem
1385 rem
1386 rem
1387 rem
1388 rem
1389 rem
1390 rem
1391 rem
1392 rem
1393 rem
1394 rem
1395 rem
1396 rem
1397 rem
1398 rem
1399 rem
1400 rem
1401 rem
1402 rem
1403 rem
1404 rem
1405 rem
1406 rem
1407 rem
1408 rem
1409 rem
1410 rem
1411 rem
1412 rem
1413 rem
1414 rem
1415 rem
1416 rem
1417 rem
1418 rem
1419 rem
1420 rem
1421 rem
1422 rem
1423 rem
1424 rem
1425 rem
1426 rem
1427 rem
1428 rem
1429 rem
1430 rem
1431 rem
1432 rem
1433 rem
1434 rem
1435 rem
1436 rem
1437 rem
1438 rem
1439 rem
1440 rem
1441 rem
1442 rem
1443 rem
1444 rem
1445 rem
1446 rem
1447 rem
1448 rem
1449 rem
1450 rem
1451 rem
1452 rem
1453 rem
1454 rem
1455 rem
1456 rem
1457 rem
1458 rem
1459 rem
1460 rem
1461 rem
1462 rem
1463 rem
1464 rem
1465 rem
1466 rem
1467 rem
1468 rem
1469 rem
1470 rem
1471 rem
1472 rem
1473 rem
1474 rem
1475 rem
1476 rem
1477 rem
1478 rem
1479 rem
1480 rem
1481 rem
1482 rem
1483 rem
1484 rem
1485 rem
1486 rem
1487 rem
1488 rem
1489 rem
1490 rem
1491 rem
1492 rem
1493 rem
1494 rem
1495 rem
1496 rem
1497 rem
1498 rem
1499 rem
1500 rem
1501 rem
1502 rem
1503 rem
1504 rem
1505 rem
1506 rem
1507 rem
1508 rem
1509 rem
1510 rem
1511 rem
1512 rem
1513 rem
1514 rem
1515 rem
1516 rem
1517 rem
1518 rem
1519 rem
1520 rem
1521 rem
1522 rem
1523 rem
1524 rem
1525 rem
1526 rem
1527 rem
1528 rem
1529 rem
1530 rem
1531 rem
1532 rem
1533 rem
1534 rem
1535 rem
1536 rem
1537 rem
1538 rem
1539 rem
1540 rem
1541 rem
1542 rem
1543 rem
1544 rem
1545 rem
1546 rem
1547 rem
1548 rem
1549 rem
1550 rem
1551 rem
1552 rem
1553 rem
1554 rem
1555 rem
1556 rem
1557 rem
1558 rem
1559 rem
1560 rem
1561 rem
1562 rem
1563 rem
1564 rem
1565 rem
1566 rem
1567 rem
1568 rem
1569 rem
1570 rem
1571 rem
1572 rem
1573 rem
1574 rem
1575 rem
1576 rem
1577 rem
1578 rem
1579 rem
1580 rem
1581 rem
1582 rem
1583 rem
1584 rem
1585 rem
1586 rem
1587 rem
1588 rem
1589 rem
1590 rem
1591 rem
1592 rem
1593 rem
1594 rem
1595 rem
1596 rem
1597 rem
1598 rem
1599 rem
1600 rem
1601 rem
1602 rem
1603 rem
1604 rem
1605 rem
1606 rem
1607 rem
1608 rem
1609 rem
1610 rem
1611 rem
1612 rem
1613 rem
1614 rem
1615 rem
1616 rem
1617 rem
1618 rem
1619 rem
1620 rem
1621 rem
1622 rem
1623 rem
1624 rem
1625 rem
1626 rem
1627 rem
1628 rem
1629 rem
1630 rem
1631 rem
1632 rem
1633 rem
1634 rem
1635 rem
1636 rem
1637 rem
1638 rem
1639 rem
1640 rem
1641 rem
1642 rem
1643 rem
1644 rem
1645 rem
1646 rem
1647 rem
1648 rem
1649 rem
1650 rem
1651 rem
1652 rem
1653 rem
1654 rem
1655 rem
1656 rem
1657 rem
1658 rem
1659 rem
1660 rem
1661 rem
1662 rem
1663 rem
1664 rem
1665 rem
1666 rem
1667 rem
1668 rem
1669 rem
1670 rem
1671 rem
1672 rem
1673 rem
1674 rem
1675 rem
1676 rem
1677 rem
1678 rem
1679 rem
1680 rem
1681 rem
1682 rem
1683 rem
1684 rem
1685 rem
1686 rem
1687 rem
1688 rem
1689 rem
1690 rem
1691 rem
1692 rem
1693 rem
1694 rem
1695 rem
1696 rem
1697 rem
1698 rem
1699 rem
1700 rem
1701 rem
1702 rem
1703 rem
1704 rem
1705 rem
1706 rem
1707 rem
1708 rem
1709 rem
1710 rem
1711 rem
1712 rem
1713 rem
1714 rem
1715 rem
1716 rem
1717 rem
1718 rem
1719 rem
1720 rem
1721 rem
1722 rem
1723 rem
1724 rem
1725 rem
1726 rem
1727 rem
1728 rem
1729 rem
1730 rem
1731 rem
1732 rem
1733 rem
1734 rem
1735 rem
1736 rem
1737 rem
1738 rem
1739 rem
1740 rem
1741 rem
1742 rem
1743 rem
1744 rem
1745 rem
1746 rem
1747 rem
1748 rem
1749 rem
1750 rem
1751 rem
1752 rem
1753 rem
1754 rem
1755 rem
1756 rem
1757 rem
1758 rem
1759 rem
1760 rem
1761 rem
1762 rem
1763 rem
1764 rem
1765 rem
1766 rem
1767 rem
1768 rem
1769 rem
1770 rem
1771 rem
1772 rem
1773 rem
1774 rem
1775 rem
1776 rem
1777 rem
1778 rem
1779 rem
1780 rem
1781 rem
1782 rem
1783 rem
1784 rem
1785 rem
1786 rem
1787 rem
1788 rem
1789 rem
1790 rem
1791 rem
1792 rem
1793 rem
1794 rem
1795 rem
1796 rem
1797 rem
1798 rem
1799 rem
1800 rem
1801 rem
1802 rem
1803 rem
1804 rem
1805 rem
1806 rem
1807 rem
1808 rem
1809 rem
1810 rem
1811 rem
1812 rem
1813 rem
1814 rem
1815 rem
1816 rem
1817 rem
1818 rem
1819 rem
1820 rem
1821 rem
1822 rem
1823 rem
1824 rem
1825 rem
1826 rem
1827 rem
1828 rem
1829 rem
1830 rem
1831 rem
1832 rem
1833 rem
1834 rem
1835 rem
1836 rem
1837 rem
1838 rem
1839 rem
1840 rem
1841 rem
1842 rem
1843 rem
1844 rem
1845 rem
1846 rem
1847 rem
1848 rem
1849 rem
1850 rem
1851 rem
1852 rem
1853 rem
1854 rem
1855 rem
1856 rem
1857 rem
1858 rem
1859 rem
1860 rem
1861 rem
1862 rem
1863 rem
1864 rem
1865 rem
1866 rem
1867 rem
1868 rem
1869 rem
1870 rem
1871 rem
1872 rem
1873 rem
1874 rem
1875 rem
1876 rem
1877 rem
1878 rem
1879 rem
1880 rem
1881 rem
1882 rem
1883 rem
1884 rem
1885 rem
1886 rem
1887 rem
1888 rem
1889 rem
1890 rem
1891 rem
1892 rem
1893 rem
1894 rem
1895 rem
1896 rem
1897 rem
1898 rem
1899 rem
1900 rem
1901 rem
1902 rem
1903 rem
1904 rem
1905 rem
1906 rem
1907 rem
1908 rem
1909 rem
1910 rem
1911 rem
1912 rem
1913 rem
1914 rem
1915 rem
1916 rem
1917 rem
1918 rem
1919 rem
1920 rem
1921 rem
1922 rem
1923 rem
1924 rem
1925 rem
1926 rem
1927 rem
1928 rem
1929 rem
1930 rem
1931 rem
1932 rem
1933 rem
1934 rem
1935 rem
1936 rem
1937 rem
1938 rem
1939 rem
1940 rem
1941 rem
1942 rem
1943 rem
1944 rem
1945 rem
1946 rem
1947 rem
1948 rem
1949 rem
1950 rem
1951 rem
1952 rem
1953 rem
1954 rem
1955 rem
1956 rem
1957 rem
1958 rem
1959 rem
1960 rem
1961 rem
1962 rem
1963 rem
1964 rem
1965 rem
1966 rem
1967 rem
1968 rem
1969 rem
1970 rem
1971 rem
1972 rem
1973 rem
1974 rem
1975 rem
1976 rem
1977 rem
1978 rem
1979 rem
1980 rem
1981 rem
1982 rem
1983 rem
1984 rem
1985 rem
1986 rem
1987 rem
1988 rem
1989 rem
1990 rem
1991 rem
1992 rem
1993 rem
1994 rem
1995 rem
1996 rem
1997 rem
1998 rem
1999 rem
2000 rem
2001 rem
2002 rem
2003 rem
2004 rem
2005 rem
2006 rem
2007 rem
2008 rem
2009 rem
2010 rem
2011 rem
2012 rem
2013 rem
2014 rem
2015 rem
2016 rem
2017 rem
2018 rem
2019 rem
2020 rem
2021 rem
2022 rem
2023 rem
2024 rem
2025 rem
2026 rem
2027 rem
2028 rem
2029 rem
2030 rem
2031 rem
2032 rem
2033 rem
2034 rem
2035 rem
2036 rem
2037 rem
2038 rem
2039 rem
2040 rem
2041 rem
2042 rem
2043 rem
2044 rem
2045 rem
2046 rem
2047 rem
2048 rem
2049 rem
2050 rem
2051 rem
2052 rem
2053 rem
2054 rem
2055 rem
2056 rem
2057 rem
2058 rem
2059 rem
2060 rem
2061 rem
2062 rem
2063 rem
2064 rem
2065 rem
2066 rem
2067 rem
2068 rem
2069 rem
2070 rem
2071 rem
2072 rem
2073 rem
2074 rem
2075 rem
2076 rem
2077 rem
2078 rem
2079 rem
2080 rem
2081 rem
2082 rem
2083 rem
2084 rem
2085 rem
2086 rem
2087 rem
2088 rem
2089 rem
2090 rem
2
```



```

35 inc C : if C>15 then C=1
40 next X
45 for X=0 to 199 step 2
50 ink C : draw 160,100 to 319,X
55 inc C : if C>15 then C=1
60 next X
65 for X=319 to 0 step-2
70 inc C : draw 160,100 to X,199
75 inc C : if C>15 then C=1
80 next X
85 for X=199 to 0 step-2
90 inc C : draw 160,100 to 0,X
95 inc C : if C>15 then C=1
100 next X
500 wait key

```

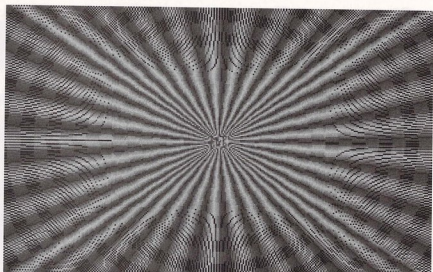
Line 10 sets up a rainbow of a palette to work with. The rest of the program is made up of four small loops that draw lines from the centre of the screen to each of the edges, then colour of the ink is increased by one each time until it hits the top colour, then the variable *C* which holds the colour register is reset to 1. Have a look over there to the right and you can see the effect of doing this – it's not bad, but it can be souped up with the addition of the groovy shift command which cycles through the colour registers – colour 1 becomes colour 2, colour 2 becomes 3 and so on. Try adding the line –

```
130 shift 2
```

The number is the delay in fiftieths of a second between changes. A second parameter can be added indicating the colour register to start the rotation from. The effect is smart, but not very controllable.

The flash command enables you to change individual colour registers. The command flash 2,* (770,4) (770,4)* flashes the colour 2 between the colour values 700 and 770 – red and yellow – at the speed of four fiftieths of a second. The list of colours to be run through can be as long as you like. One colour can be set flashing through the spectrum while all your other colours are fixed.

Next on the list of snazzy colour controls is fade. Like shift and flash it works using an interrupt – that is, the command continues to work while your program goes on to the next line. You just have to set things in motion. Try adding –



● No tedious initialisation routines or complex and obscure commands here – STOS and a snippet of code can create beautiful screens together.

```

105 fade 4
110 wait 50
115 fade 4,$0,$077,$067,$057,$047,$037,↓
    $007,$307,$407,$507,$607,$707,$606,↓
    $505,$404,$303

```

The first fade command fades everything to black, changing each register by one red, blue, green value each four fiftieths of a second. To fade the colours to another colour, just add the new colour values to the command. Line 115 fades all 16 colours to new colour – a mild blue and purple mix before the colour shift starts and slowly turns your mind to jelly. There is no excuse for a dull-looking STOS program with easy and powerful colour handling stuff like this.

LET'S LOOP TOGETHER

One of the fundamental cornerstones of programming is the loop. It's highly unlikely that you only need to perform each command once, and to save endless typing and silly listings, the three main loop com-

mands were born. They are common to almost all modern computer languages and appear in every program ever – except two and we don't mention those. The commands are *for*, *next*, *repeat*, *until* and *while*, *wend*. They all do similar things but with important differences.

The *for*, *next* loop repeats a series of commands the number of times set by two variables. If you wanted to print "hello mum" 30 times off the screen, you could type the relevant command into the listing 30 times, but it's a damn sight easier to loop the command 30 times. Like so –

```

10 for X=1 to 30
20 print "hello mum"
30 next X

```

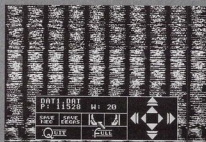
Line 15 set the number of times the commands between the *for* and *next* are executed by using two variables. Each time the text is printed *X* is increased by one until it hits 30, then the program

STEAL ME A SPRITE - I'LL BE BACK AFTER LUNCH - OR

One of the sneaky tricks that the STOS sprite accessory has up its digital sleeve is the ability to steal sprites from almost anywhere. Games often hold the graphics and sprites in external data files which you can easily raid. You can't use nicked graphics for commercial purposes without written permission, for fear of legal action and a severe duffing-up by the original artist. You can, however, mess about with them, use them in your own productions, gain inspiration or use them as a starting point for your own graphics. Here we are raiding the sprite files from *Droid* – that delightful platform game from last month's Cover Disk. It features a cute animated walking robot that could come in handy.



● Sprite stealing the easy way. First select the "grab from program" icon – that's the one with the hand holding the disk. Now pop in the disk with the file you're going to raid, click on the arrow and select a file. The File DAT1.DAT holds the sprites you want.



● And here it is – looks a complete mess, right? That's because the sprite files are usually not stored as full screens but as strips of sprites. The icons showing the hands pushing do just that to the screen, squish it about... The arrows scroll around the file. Fiddle with things until you get some recognisable graphics on the screen.

continues. With some fiddling you can use the variable within the loop. To draw a series of circles across the screen try

```
10 for X=20 to 300 step 40
20 circle X,100,15
30 next X
```

The `step` command alters the rate the variable `X` is changed as it goes through the range 20 to 300. Each time the loop is executed, the circle is drawn further across the screen as it uses `X` as one of coordinates of the centre. The other two loop commands are different because they endlessly repeat a series of commands until a condition is met. The `repeat...until` loop checks this condition at the end of the loop and the `while...wend` checks at the beginning. The main difference is that a `repeat...until` loop is executed at least once. Try

```
10 repeat
20 if mouse key = 1 then plot x mouse,1
   y mouse,1
30 until mouse key=2
```

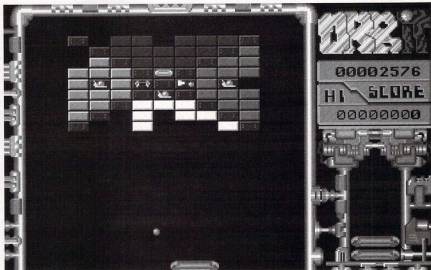
This enables you to scribble with the left mouse button until you press the right button. There is no way to avoid the loop. With `wend` the condition is set at the start and the loop only executed if it is met. Try

```
10 input "What's the magic word? ";AS
20 while AS<>"ST"
30 input "Wrong, try again ";AS
40 wend
50 print "Well done"
```

The commands between the `while` and `wend` are never executed if you enter the correct letter first time – otherwise you're stuck in the loop until you get it right. Almost every game or application has a few loops in it, so it's important to get the hang of this loop thing before you start next year's big thing.

FLIPPIN' HECK

Screen flipping is your friend – it's an invaluable technique for getting your graphics moving smoothly and to escape any flickering. Normally graphics are drawn directly on the screen and, although it's quick



● **STOS at its best, *Bullet* is one of the demo games that comes with the language and really shows off what you can achieve with just a small spot of good coding.**

if you draw large objects or use big sprites, you get a flicker. The trick is to draw things out of sight and display the screen when it has finished drawing your sprites and scrolling has finished. Load the `SPRDEMO.MBK` into memory bank 1 with the direct command `load "sprdemo.mbk",1` and try this –

```
10 repeat
20 ink rnd(15)
30 X=rnd(160)+80 : Y=rnd(100)+50
40 circle X,Y,rnd(100)+50
50 sprite 1,X-32,Y-15,3
60 until mouse key<>0
```

This draws randomly-coloured circles over the screen with a big `STOS` sprite in the middle until you hit the mouse button. Everything works but it suffers from synchronisation problems – it's flicker-city. `STOS` sends graphics to the logical screen address, by default this is the same as the physical screen – that is, what you see. To send them elsewhere you need

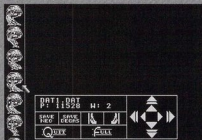
to redefine the logic screen. Add these lines to smooth it out –

```
15 reserve as screen 10 : logic=10
55 wait vbl : screen swap
```

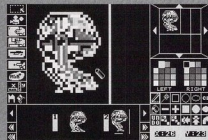
Memory bank 10 is reserved as a graphics screen and then set as the logic screen address. All graphics are now drawn on this screen rather than on the visible physical screen. Line 55 swaps over the logical screen and the physical screen. The `wait vbl` stops things for a fraction of a second until the monitor hits a vertical blank. The display is updated 50 times a second – this command waits until a screen is complete before trying to display another one. Without this, the sprite lags behind the circle by a fraction. Unless your program uses very simple or static graphics you need to suss out a screen flipping loop to get things moving gently and smoothly.

Finally, prepare to turn yourself into a programming wit by taking a peek at the `STOS` special offers on page 114. *stf*

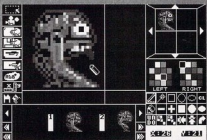
PERHAPS A LITTLE LATER – IN TIME FOR AFTERNOON TEA



● **Bingo!** The robot sprites. You can use the up and down arrows to browse through them. To grab one, press the right mouse button and drag until you get an appropriately sized box. Position the box and click with the left button to grab him.



● Here we are with the borrowed sprites in the `STOS` sprite accessory. You have to work out the palette for yourself and do a spot of tidying-up. You can grab the set of walking sprites from *Droid* with no trouble.



● After sussing the palette, you can start the serious business of mucking about with the sprites and using them for your own nefarious purposes. Time for a few subtle changes first.

ZOLTAR - AND WHAT YOU CAN DO TO IT

One of the best ways to learn the basics is to dissect someone else's code and learn how it was nailed together. With *STOS* come a couple of example games including the shoot-'em-up *Zoltar*.

You could start your programming career with a few alterations. The program starts by initialising variables in lines 10 to 1000. These set the variables and unpack the graphics. The title screen is held in memory bank 5 and the big baddie that appears at Level Five is in bank 6. The graphics are put into strings using the `screen$` command. A few subroutines are called to clear and reset the screen, draw the games screen, set up attack wave and initialise the movement data. The menu is set up and control passes to the menu routine on line 11005. If "Play" is selected the program goes into the main loop at line 1100.

Here are a few possible changes to experiment with in the comfort of your own home:

1 Line 1100 holds the variable which stores the initial numbers of lives, appropriately called `LIVES`. You can change this in order to make things harder or easier.

2 Line 10505 is the scoring system which each alien scores 200 plus a random number between 0 and 100. You can fiddle with this and set-up a new system.

3 If you have the Stars extension installed from last issue you can add a parallax scrolling starfield as the background without any problem. Try adding these lines—

```
55 set stars 50,1,0,0,319,192,1,3
56 stars wipe on
10200 go stars 0,1,logic
10202 screen copy 10,0,192,1
320,200 to logic,0,192 : return
```

4 Turn off that "interesting" music by searching for the `music 1` commands. Search for a command by typing search "music 1," – the first occurrence pops up. To find further occurrences just type in search again.

5 Load in the sprite editor and have a fiddle with the sprites. Redraw those aliens as members of the cabinet or something, and give your ship decent bullet things..

6 The palette is on line 10060, you can add up different palettes for each level. A good start is changing the awful cycling colours used for the score – they're the last three.

7 With some effort you could add new types of levels, groups of alien with different attack waves, new big baddies – whatever takes your fancy, really.

SPEED IS OF THE ESSENCE

Good zappy games need zappy code. There are lots of ways of going about algorithms – some a darn sight faster than others. Once a program's doing what you want it to, it's a good idea to have a good look at it and try to optimize things to squeeze that extra bit of speed out of things.

1 That old favourite the `if...then` command is faster than the Boolean algebra.

2 Use `inc` and `dec` if you only need to alter numbers by one rather than `A=A+1` use `inc A` – it's about 25% faster.

3 Avoid too many commands that work under interrupt. Playing music or samples during sections where speed is crucial. If you're using menus, kill them when they're not needed. The mouseoff command from the *Misty* extension zaps the mouse completely, freeing up more valuable processor time.

4 Keep those sprites small and keep the numbers on-screen down if you can. If something

doesn't move for a bit, then why waste a sprite on it?

5 If you do any division or multiplication by numbers that are powers of two, then use the `ror` and `zol` commands instead – they're a lot faster.

6 The background screen holds an exact copy of the screen on display minus any sprites and is automatically updated – this is useful but slow and not always needed. Use the `autoback off` command at the start of your programs to speed things up. If you use sprites, it's faster to set things up using the `screen copy` command.

7 Use the actual values rather than variables for constants if possible, `A=A+12` is faster than `A=A+CONSTANT`.

8 If your program uses complex equations during your loops, work them out first using look-up tables – these are usually in the form of data statements or arrays that you generate at the start of your program.

LET'S SCROLL ANOTHER ONE

There comes a time in every screen's life when it wants to scroll. It's perfectly natural and nothing to worry about – many screens go through a phase of scrolling several times a day. *STOS* thoughtfully provides custom com-

mands to make things move smoothly. You can define up to 16 zones – areas of screen that are going to be scrolled.

You define the top left and bottom right coordinates and the vertical and horizontal

scrolling rates then *STOS* handles the rest. To scroll a defined area, you just have to use the `scroll` command – simple. Load up a picture into bank 6, get it up on-screen then follow these simple steps...

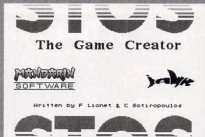


Start here:

```
20 A=0 : B=1
30 def scroll 1,0,0 to 320,200,A,B
40 for X=1 to 200
50 scroll 1
```

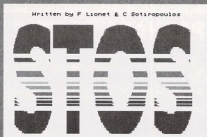
```
50 next X : goto 40
```

The `def scroll` command sets up scrolling zone as being the whole screen and the `for...next` loop executes the `scroll` 320 times. The screen disappears off the screen. Alter the variables `A` and `B` to send the screen scuttling off in different directions and speeds. There's one problem with this version – nothing appears at the top of the screen to fill the gap.



Then add:

```
20 B=1
40 for X=200 to 1 step-B
55 screen copy 6,0,X,320,X+8 to physic,0,0
Add these lines and the screen should wrap round as it scrolls. Line 55 copies a section from the unscrolled original picture to the top of the physical screen to fill in the gap left. We need to shift the area we copy at the same rate that we scroll the screen, so it all looks pretty and smooth.
```



Finally, add:

```
30 def scroll 2,0,0 to 320,52,0,1
32 def scroll 2,0,50 to 320,103,0,2
34 def scroll 3,0,100 to 320,154,0,3
36 def scroll 4,0,150 to 320,200,0,4
50 scroll 1: scroll 2 : scroll 3 : scroll 4
Now we've four scrolling zones moving at different speeds producing an interesting wibbly effect. Try altering the scrolling speeds by changing the last parameter of the def scroll, and adjusting the sizes of the scrolling zones for more wibbliness.
```


Just how long have you had your – er, problem? Have you had to suffer quietly, hoping no one would notice or that it would go away of its own accord? Worries be gone! Write to ST Answers, ST FORMAT, 30 Monmouth Street, Bath, Avon BA1 2BW stating the nature of your difficulty. Confidentiality denied

THE ICONS

BEGINNERS

Do you feel as if you should be in charge when you're using your ST? Learn to crawl first – start here.



COMMS

For keeping your ST in touch with the world, you need to watch out for this attractive icon.



DISKS

These vital bits of equipment don't always work as well as they might. Floppy probs here.



GAMES

A special extra to Gamebusters this issue for serious game-players who can't get enough.



GRAPHICS

Now, pictures aren't really the basis of graphics – your art package is, so's your monitor. Check 'em out.



HARD DRIVES

Indispensable, these are, once you've got used to them. So what do you do if they cease to exist? Panic!



PRINTERS

Why does your work not look as you want it to when you spent so much time on it? Blame your printer.



PROGRAMMING

There's something for everyone here this month – STOS, GFA Basic and assembly. It's all here.



SOUND

Keep up the ST's reputation as the music machine – sort out your problems here.



ST PROBLEMS

Bits and pieces, odds and ends, all the other extras about hardware that didn't fit elsewhere are here.



A quick query (or ten)



I am going to start college in September and I want a PC emulator for my ST. Could you please answer a few questions.

1. Is there an emulator that is compatible with a 486 or at least 386 at 25MHz?
2. Can I plug in a PC hard drive to my ST?
3. Can I use Windows on an emulator?
4. How do you access the emulator from the ST?
5. Can I use PC programs without problems?
6. Can PC games run from the emulator?
7. Does the emulator need soldering?
8. What graphics modes are available? Can I use a Super VGA monitor?
9. Is the PC's sound output by the ST?
10. What is the fastest 386 emulator on the market and how much does it cost?

Nathan Peacock, Bucks

stf: To start at the beginning, then...

1. There is no 486 emulator available. The

Vortex 386SX running at 16MHz and is the fastest you can get. The Vortex is available from HCS for £330 in both STE and Mega STE versions. HCS can be contacted on 081 777 0751.

2. PC drives cannot be connected directly to the ST.
3. Windows can be used on a 386 emulator, although 4Mbytes of memory and a hard drive are recommended.
4. The emulator is switched on by software control.
5. PC programs generally run without problems on an emulator.
6. Some games will run, but EGA and VGA colour games are not supported.
7. It depends on your machine if soldering is required. Generally older STF and STFM machines need emulators soldered in and STEs and Mega STEs can have emulators plugged in.
8. The Vortex supports mono, Hercules, CGA and mono VGA graphics modes. Only the ST colour or mono monitors can be used

STOS CORNER

Billy Allen tackles your STOS queries

```
50 wait key
60 look $4D2,0 : rem % J
    Disable interrupt <
```

Musical ST formats

I'm writing a demo in STOS, but I don't think much of the STOS generated music. Can I play chip music if it's stored in the Quartet format?

Richard Nichols, Bedford

stf: Quartet music is created purely from sound samples. As you rightly point out, STOS chip music is pretty crap on the whole. Unfortunately almost every ST musician uses their own music format, so, to play back music by different people, you need to create different routines. Mad Max music is by far the most common, however, so here's a routine to play it back from within STOS:

```
10 reserve as work 10,30000
20 blood "mad_max.mus",10
30 dreg(0)=1 : call start(10) : J
    rem Initialise music #1 <
40 look $4D2,start(10)+8 : rem % J
    Play on interrupt <
```

Irregular movements

When writing a game in STOS, I cannot get my sprite to move for the same length of time as I hold down my joystick. Can you help?

Daniel Moss, Kendal

stf: Well, that's what comes of using STOS sprites. We assume you are using the MOVE command to move the sprite. Try defining an X and Y variable and controlling them yourself rather than using MOVE. Try this routine:

```
10 X=0 : Y=0
20 repeat
30 if jleft and X>0 then dec X
40 if jright and X<288 then inc X
50 if jup and Y>0 then dec Y
60 if jdown and Y<168 then inc Y
70 sprite 1,X,Y,1 : wait vbl
80 until fire
```

If you are designing a game then it is best to avoid using STOS sprites

— PC monitors cannot be connected.

9. The PC's beeps and burlles are fully supported by the ST.

10. At the moment the Vortex is the only option available when it comes to 386 emulators.

Very hardcard



I have a 40MByte Western Digital hardcard from my old (dead) PC-XT. Is there any way that it can be connected to my ST?

Athanasios Kitselis, Sheffield

stf: A hardcard is a hard drive mounted on a PC expansion card designed specifically for use in a PC compatible machine. Because of this it is impossible to connect it to the ST.

Data-basics



I am having problems with Database Master One. I cannot print out a single index card from a file but I have to print the entire thing. Is there a program that can just print one card at a time? Can I transfer my files to the other program to save re-typing all the information?

K R Martin, Hants

stf: If your program can save the database as an ASCII file then it can be imported into practically all other database programs. Try Supercard 2 from BWare Software which we featured on Cover Disk 35 — it is a Shareware

program with all the features you would expect to see on a full price database. It has an extensive filter feature which enables specific files to be searched for and displayed, and has a single card print option. The program is well worth the £15 registration fee and is supplied with a good 76 page manual. You can contact BWare on 0455 613377



■ This is it, Supercard 2. If you haven't got it then nip back to page 58 and order a back issue of ST FORMAT 35 — you'll find it on the Cover Disk, guys!

2 into 1?



I have a 520 STFM and a Mega STE which I use with the Philips CM8833 monitor. The monitor has a SCART connector and an 8-pin TTL RGB input and the manual says that the TTL 8-pin input takes priority — that is, it turns off the SCART linear RGB input if there is an 8-pin TTL RGB input. Can I plug both machines into the monitor at the same time? I don't want both machines running at the same time, I just want to avoid constant

plugging and unplugging of the leads. Fatty, Consett, Co Durham

stf: The RGB output from the ST is linear RGB and is not directly compatible with a TTL RGB input, so you should not connect either of your machines to the 8-pin port. However, if you must have both machines connected at once then you can get a 2 to 1 SCART adaptor from Maplins Electronics, part number ZB29G, for £9.95. It is not recommended that you connect two outputs to one input in this way because you could damage the monitor if both machines are switched on — it could happen accidentally! Maplins can be contacted on 0702 554161.

8 or 9 chips?



I have been offered some cheap 1MByte SIMMs from a PC. The problem is that they have 9 chips, not 8. Are 9 chip SIMMs compatible with the STE?

Frank Melady, Dublin, Eire

stf: 9 chip SIMMs are compatible with STEs — you can install them without any worries.

Hardened killer



I have several Public Domain virus killer programs which seem to work very well. Is there any advantage to buying the Ultimate Virus Killer? I am reluctant to spend £10 on a

because they are slow, flickery and difficult to handle. Next month there is a section on creating your own sprite routines, so if you can wait for a month all your spritey blues will be washed away.

Go public

Could you please recommend a cheap STOS book? My price bracket is around £5. James Birse, Poole

stf: The only STOS book around is The Game Maker's Manual which is available from Sigma Press (0625 531035 £12.95). But even that might be a bit expensive. Your best bet is to get some disks containing STOS source code from a PD library — contact Goodman's International on 0782 335650 — they have a large library of STOS routines and source code. There are also PD disk magazines which you could try — HP Source contains some excellent STOS articles.

Protection racket

How can I check if the current disk in the drive is write-protected? Also, how can you

check if there is a disk in the drive? Sam Trent, Paisley

stf: Other versions of BASIC can access the ST's BIOS directly from within a routine but STOS cannot do this. The only way to check the disk from within STOS is to try saving something to the disk, then, if you get a disk error, treat the disk as write-protected. Use the same method to test for a disk, but try to load rather than to save something. This routine should do the job:

```
10 on error goto 30
20 open out #1,"DUMMY": :J
   close #1 : goto 50
30 print "Disk is write-protected!"
40 resume 40
50 ...
```

STOS tipettes

And finally some little tips to aid you in your programming efforts.

A quick way to get the palette from a sprite bank:

```
10 H=hunt(start(1) to start(1))J
```

```
<length(1),"PAL")>+4
20 luke $45A,H : wait vbl
```

If you want to change frequency while you are in a program, try

```
10 wait vbl : poke $FFF820A,254
```

for 50 Hz, or

```
10 wait vbl : poke $FFF820A,252
```

for 60Hz.

A quick way to round a number to the nearest 16 is

```
10 X=X and $FFF0
```

If you want to scroll the screen by eight pixels up or down you could try "cheap" hardware scrolling.

```
10 repeat
20 phys=cphys-1280 : wait vbl : e
   rem= add 1280 to scroll up <
30 if phys<32000e
   then phys=default phys=c
40 until inkey$=""
50 default
```

Brains and the rest of the International Rescue squad are here this month, ready to come to your aid at a moment's notice. Clive "Yes, m'lady" Parker dives headfirst into the mailbag and sorts out those tricky technical problems. Write to ST Answers, ST FORMAT, 30 Monmouth Street, Bath, Avon BA1 2BW

THE ICONS

BEGINNERS

Have you just bought an ST? Then turn to the bits with this icon for sound, no-nonsense advice.

COMMS

If you talk through your monitor – and some people can – check this out for help with those comms.

DISKS

Whether your disks are floppy or hard, this is the spot for you. We solve your disk problems here.

GAMES

Oh! If you want to cheat then read the Gamemasters pages. This section is for serious traumas only.

GRAPHICS

If you can't tell a pixel from a palette your eye came to the right place. Budding Picasso start here.

HARD DRIVES

The harder they come, the tougher they fall. Our resident doctor puts a plaster on the sore parts.

PRINTERS

Do your characters print backwards? Having trouble with your sheetfeeder? Turn to this pic for help.

PROGRAMMING

Getting your calls confused? Get 'em sorted with this month's STOS and assembly tips.

SOUND

Does your (100) sound like Kylie at 160pm? Just read this and take those earplugs out.

ST PROBLEMS

This icon is for all other bits that have nowhere left to turn. We can help give them some pointers.

Simple scanning

What are hand scanners and how do they work?

Mark Herbert, Bristol

stf: That's what we like, the simple stuff. There are two ways to answer this question: the easy way and the techie way.

1. A scanner is a small device that plugs into the cartridge port of the ST and enables you to copy pictures from paper and photographs and convert them to a computer image.

2. Hand scanners are opto-mechanical devices which contain many electronic components crunched down and combined into a single chip. This chip is called a gate array. When a scanner is activated and moved over a drawing or a picture, light shines on to the paper from a

line of LEDs built into the head of the scanner. Depending on the colour and tone of the paper, light is reflected at various intensities back to a convex mirror in the head of the scanner.

The mirror concentrates the light and directs it through the lens on to a light sensitive component called a Charge Coupled Device Array, or CCD. This converts the light into digital signals which are converted to a visual display by the scanning software. And that's all there is to it.

Fantasy island

The other day I mentioned to a friend that I was going to buy a modem for use with my 1040 STE and his advice was not to bother. He has told me that we are changing to a "System X" telephone



STOS CORNER

More of your STOS queries answered by Billy Allan

A changing environment

Please can you tell me what the ENV command is for since I can't find it in the STOS manual? Also, why don't the STE or Misty extensions work in high res?

Mark Westguard, Johnshawen

stf: As far as we know, changing the screen colours is all the ENV command does. Neither the STE commands or Misty work in high res because the authors of these programs don't have mono monitors and so could not test mono commands.

We want information

I am writing a disk copier in STOS and want to know 1. How can I check the disk format (for example, how many tracks there are) and 2. How to format individual tracks with the Format program from the STOS compiler.

Jill Markham, Woodley

stf: 1. The format information is stored in the bootsector of the disk, which is the first sector of track zero on side zero. This routine can give you the required information – note that the -J signs means no line return yet; the line just wouldn't fit in our narrow columns.

```
10 reserve as work 10,1024
20 DRV:=drive : floprdJ
start(10),1,0,0,1,DRV
```

```
30 S10:=start(10) : poke S10,peek(S10+20)
40 poke S10+1,peek(S10+19)
50 NUMSEC:=deek(S10)
60 SECTRK:=peek(S10+24)
70 NSIDE:=peek(S10+26)
80 NTRAK:=(NUMSEC/NSIDE)/SECTRK
90 print "Total sectors =";NUMSEC
100 print "Sectors/track =";SECTRK
110 print "Sides =";NSIDE
120 print "Tracks =";NTRAK
```

2. You can't. It only formats disks from track zero to a given number and automatically installs the bootsector. You have to access the XBIOS function floprnd() yourself.

Short of memory

Every time I try to load the droid sprite files, the sprite editor crashes and says "Not enough memory." Do you think I need to upgrade my 520 STFM?

Nicky Haley, Milton Keynes

stf: You can only load these files on an ST with 0.5MByte of RAM if you have TOS 1.0 installed. This is because later versions of TOS are larger and occupy 32K more RAM space, leaving less room free for programs. It would be worth your while getting a memory upgrade since they can cost as little as £40 for the STFM. We have a 2.5MByte memory upgrade on our development machine and we usually have the STOS compiler located in a RAMdisk; we can then compile a STOS Basic file to GEM in seconds.

exchange which will enable me to plug my STE directly into the phone socket.

Could you let me know what cable and software I need to connect my machine up? I have not heard of this system before but my friend is an electronics lecturer and has a Masters Degree in Science, so he must know what he is talking about.

G F Boote, Lancs

stf: Just because someone has an MSc does not mean that he is necessarily sane or has a complete set of The Home Computer Course tucked away. Most of the people who work on STF have degrees and it doesn't mean a bean.

At the moment the only way a standard computer can interface with a telephone line is by means of hardware, most commonly a modem. Some more advanced machines with extra hardware – such as the Falcon with its DSP56001 processor – can interface with the telephone lines just using a software modem. This is not possible with the 1040 STE no matter what kind of exchange is installed by BT because it just does not have the hardware to process this kind of data.

Newcomers' corner



1 My friend has a 1040 ST for sale for £150. Should I get the memory checked to make sure that it is OK and worth the money?

2 Can I play games on a 1040 STF?



STF GOES ON-LINE

Chris Dammers from Cobham wants to know if there are any BBSs that support the Atari ST. Here is a short list of some popular boards, all of which have large ST areas and lively message bases.

Ad Lib 2 BBS 24 hours = 0454 317047
Ad Lib BBS 24 hours = 091 370 2659
Bath BBS 24 hours = 0225 840060
The Bull Ring BBS 9pm - 9am = 021 773 4156
The Vault BBS 9pm - 9am = 0726 84900

3 What is an HD?

4 What are the best flight simulator and football management games available for the ST?

Michael Jones, Herts

stf: 1. The chances are that, if the machine works at all, the memory is fine because 1040 STs have their memory installed at the factory. If you can run software without problems, don't worry. £150 is a reasonable price for a second-hand 1MByte machine.

2. Yes, you can play games on a 1040 – in fact, many games are better on a 1040 machine because they can load in extra graphics and sound effects.

3. An HD usually refers to a hard drive – this is a hardware device that can store many times more information than a floppy disk, typically

ST FORMAT BBS 24 hours = 0225 461330

Yes, that's right. The ST FORMAT BBS is now operating 24 hours a day on = 0225 461330 at 9,600 baud under the expert guidance of our Tech Ed Clive Parker – having drawn the short straw – in charge. You can log on to chat about ST subjects, the Falcon030, programming, graphics or whatever you like. You can leave your ST Answers queries, Feedback letters or general views about the magazine, Atari, life or anything ST related. So get those modems beeping and call the ST FORMAT BBS.

30 to 100 times as much. Hard drives are also much faster at loading and saving data than floppies, but are also much more expensive. Hard drives are used mainly for "serious" computing purposes but they are dropping in price all the time – a 30MByte drive can now be obtained for £239 from First Choice Computers on = 0532 319444.

4. Our games guru, Andy Lowe, recommends both F-19 Stealth Fighter from MicroProse and Thunderhawk from Core Design if you want action-packed flight and fight simulators. Championship Manager from Domark is being reviewed in issue 42 of STF, barring unnaturally sunny days or other circumstances beyond our control. It looks as if it's going to be a blast.

Extend yourself

1. Is there a book available on writing STOS extensions?

2. Where can I get STOS extensions from?

3. Is it worth getting STOS Maestro Plus?

John Rice, Leeds

stf: 1. We learned STOS extensions from the Game Makers Manual from Sigma Press (= 0625 531035 £12.95). However, you need a fair understanding of assembly language before you can create extensions.

2. Most good PD libraries stock these extensions. Try Goodman's International on = 0782 335650.

3. It all depends on what you need – Maestro is useful because it's specifically created for STOS and comes with the Maestro extension, however, it doesn't have the features of samplers like Stereo Master which gives stereo sampling.

Perfect timing

I am writing a timing program in STOS Basic where I wanted to show large numbers and letters on the screen. I found that the large character set in STOS is very blocky and sprites take too long to display – I need to be able to show times in hundredths of a second intervals. Can you help?

Bill Giggie, Dublin

stf: If you want to count in hundredths of a second, then the `SKOPY` command from the Misty extension (on ST FORMAT Cover Disk

38) is the only command which enables you to draw up large characters in such a short space of time.

Try the following routine if you have your numbers as a 64 x 64 sprite bank:

```
10 mode 0 : key off : curs off : _J
   hide on : mouseoff
20 reserve as screen 10 : _J
   dim ADR(9),TM(3)
30 BP=0 : X=0 : Y=0
40 for T=0 to 9
50 sprite 1,0,0,T+1 : update
60 ADR(T)=BP+(X/2)+(Y*160)
70 skopy 1,logic,0,0,64,64,_J
   start(10)+ADR(T),0,0
80 BP=BP+2 : if BP>6 then BP=0 : _J
   X=X+64 : if X>256 then X=0 : Y=Y+64
90 next T
100 sprite off : update
110 for T=0 to 3 : TM(T)=0 : next T
120 logic=back
130 repeat
140 for Q=0 to 3
150 skopy 1,start(10)+ADR(TM(Q)),_J
   0,0,64,64,logic,Q*64,0
160 next Q
170 TM(3)-TM(3)+2 : if TM(3)>9 _J
   then TM(3)=0 : inc TM(2) : _J
   if TM(2)>9 then TM(2)=0 : _J
   inc TM(1) : if TM(1)>9 then _J
   TM(1)=0 : inc TM(0) : _J
   if TM(0)>5 then TM(0)=0
180 screen swap : wait vbl
190 until inkey=""
```



Sprite-tastic tip

The basic principle of fast sprites on-screen is called "pre-shifting." It works like this: instead of having just one image of a sprite and scrolling it around before putting it on the screen as the

normal `SPRITE` command does, we hold 16 images in memory and each one is scrolled to the right of the last. This means that you can place the correct image immediately without any time-consuming scrolling to get through first.

Unfortunately, holding 16 images of a sprite takes up a lot of memory. Therefore we sometimes hold eight, four or even just two images of the sprite and round off the screen co-ordinates to the nearest two, four or eight.

To calculate which image to put on the screen you have to divide your coordinate by 16; the remainder is the correct image number. STOS has a command to do this called `MOD`. So, for instance, "165 MOD 16" returns a value of five and "18 MOD 16" returns a value of two.

It is usually best to use the `SCREENS` command to draw the sprites rather than `SPRITE`. This is because `SCREENS` is much faster and it doesn't slow down when two sprites are on top of each other.

On this month's Cover Disk are some example BASIC files for you to experiment with. They show the basic techniques of "pre-shifting" and also how to simulate the various STOS commands like `MOVE` and `COLLIDE`.

Questions, questions, questions, that's all we get here in the ST Answers department – and we love 'em! You tell us your problem and we'll give you an answer – address your queries to ST Answers, STF 30 Monmouth Street, Bath, Avon BA1 2BW and state the nature of your problem on the envelope

THE ICONS

BEGINNERS



Don't leave one end of your ST from the other? Then you must be new to the ST – look for this pic.

COMMS



Are you fascinated by the world of modems and communications? Check it all out here.

DISKS



Your need your floppy and hard disks work properly. Having prob? Here we sort them all out.

GAMES



Sol! You want to cheat, huh? Well, look at Gamebusters since we don't cover games this month.

GRAPHICS



So much potential can be achieved in the world of ST art and graphics. If only you knew how...

HARD DRIVES



If you have one, you want to use it, right? To get the most out of yours, check out this icon here.

PRINTERS



Does your paper all get in a tangle when faced with your ST? It needs consulting – we can help, relax...

PROGRAMMING



All sorts of programming this month, listings and every-thing. Brilliant. If you like that sort of thing.

SOUND



Many people can't live without music, so make sure you keep your gear in order. This is where.

ST PROBLEMS



Miscellaneous bits and pieces live in here – so if your problems are vague and woolly, come here.

Budding Walt Disney...



I am interested in making short cartoons around 20 to 30 seconds long using my STE. The characters are 2D Mickey Mouse style animations. Is this possible on the STE and how can I transfer them to video tape? Do you think it would be easier to use a Falcon?

I find it very awkward drawing with the mouse, is there a better pointing device for the ST that feels like a pencil?

Colin Brunger, Kent

stf: Yes, you can produce excellent animations on the STE. The program you are looking for is called Deluxe Paint from Electronic Arts (= 0753 549442), this program enables 999 frames of animation to be created. We created a 300 frame animation that used about 800K of disk space – this should be ample for your needs. The length of the animation is limited only by memory size and disk

space – the more you have of each, the larger the animations can be.

Another point to consider is how complex the animation is going to be, if you have a vastly detailed background then each individual frame is going to take up more space. If you have a simple background, then not so much memory space is used by the animation.

To record your animation to video tape, a standard STE to SCART TV lead should do the trick. Do not use a STE to monitor SCART lead because this does not work with a video recorder since monitor leads use RGB signals, while TV and video recorders use composite video signals. You can get a STE to SCART TV lead from Meedmore (= 051 521 2202) for £8.80.

Finally we come to your drawing device. Your best option is to get the Golden Image Brush Mouse from Loadbroke Computing International (= 0772 203166) which was awarded an STF rating of 88% in issue 37. This is a replacement mouse shaped like



STOS CORNER

Billy Allan tries to sort out your STOS programming queries

It's the size that counts

I have written a backup program which backs up new or updated files on my hard drive. The problem is that when I `BSAVE` the file, its length is rounded to the nearest 256 bytes.

Wayne Carol, New Zealand

stf: We suspect that you are saving out the file like this:

```
10 bsave "file.dat",start(x);
   to start(x)+length(x)
```

The problem is caused by STOS always reserving memory banks in multiples of 256 bytes, so you need to do something like this to get the actual length:

```
10 open in #1,"file.dat" :
   l=lof(#1) : close #1
20 bsave "file.dat",start(x) to start(x)+l
```

which ought to solve the problem.

Random problems

In 1st Basic there is a command called `RANDOMIZE` which mixes up the ST's clock so that the random number routine works properly. Which command does the same in STOS?

Mikko Ranta, Finland

stf: STOS doesn't need to initialise the random number routine before you call `RND(X)` to get a random num-

ber. You can, however, greatly improve the randomness of the result by randomising the `TIMER` variable as well:

```
10 for T=1 to 100
20 timer=rnd(50000) : print rnd(100)
30 next T
```

Nice front end

I would like to have point-and-click interfaces in my programs, but how do I check for the mouse clicking on a box on the screen? Also, when I try and link scrolling frames, as in video titling programs, I get a stop in between. Please help.

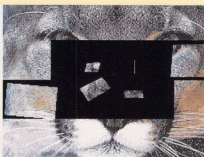
Bill Jones, Holyhead

stf: To check for collisions with the mouse and a box use the `SET ZONE` and `ZONE(X)` commands. This should demonstrate the basic principle:

```
10 set zone 1,0,0 to 32,32
20 repeat : zzone(0) : n=mouse key :
   until Z=1 and M=1
```

Since you have an STE, you can use the enhanced hardware to solve your scrolling problem. Assuming you have three pictures you want to scroll through, this ought to work OK:

```
10 reserve as work 10,4*32000
20 load "pic1.neo" :
   screen copy logic to start(10)
30 load "pic2.neo" :
   screen copy logic to start(10)+32000
40 load "pic3.neo" :
   screen copy logic to start(10)+64000
```



■ Another animation created by Deluxe Paint. We took a picture of a lion and broke it down into 16 segments, these segments then tumble towards the front screen from a vanishing point at the back of screen and assemble themselves into a complete picture.

a rather thick pencil – it sounds like being just what you want, and a new higher dpi version is now available. The Brush Mouse costs just £19.99, or if you lash out an extra fiver you can get Deluxe Paint with it for £24.99.

Bubble trouble



Please could you tell me if I can use the Star SJ-48 BubbleJet printer with my IMByte S20 ST? If I can, where can I obtain printer drivers for the programs I use? I need printer drivers for Time-works 2, Write On and First Word Plus.

David Woodley, Devon

stf: Good news for you, David, the Star SJ-48 printer can use some of the printer drivers that are supplied with the programs you mention. If you look at your printer manual, you can see that it explains that the printer works under Epson LQ and IBM Pro-printer emulation. What this means to you is that you simply select the Epson LQ drivers when you're installing Write On, and select Epson LQ drivers from the other programs. The Star LJ-48 can use both 180 dpi and 360 dpi Epson LQ drivers, so you can achieve excellent results with all of your software. Practically all serious software has Epson LQ printer drivers included as standard so you can use your printer with any program.

.IMG package required



Is there a graphics package that can be used from a hard drive and in all three resolutions? I also need to be able to save files in .IMG format so that I can import the files into my DTP software, I have tried using Canvas from your Cover Disk but this program seems to balk at loading and saving files to my hard drive. There also seems to be a problem with .IMG format in Canvas – it doesn't work!

David G Hibbert, Cheshire

stf: Canvas has never worked properly with .IMG files although we have never had any problems with running it from a hard drive. The only program that springs to mind that works in the way you require is Hyperpaint by Atari. Both Hyperpaint and Hyperpaint 2 support Degas and .IMG files in all three resolutions, and Hyperpaint 2 supports Neo-

chrome files in all three resolutions. You can get Hyperpaint 2 from Softmachine for £29.95, call 091 510 2666.

PAL confusion



I have a PAL TV and I wish to change it to SCART, is there a device that enables me to do this or do I need a SCART TV?

J D Gordon, Edinburgh

stf: We assume you mean you want to change from using an RF (aerial lead) connection to a composite video (SCART) connection. Unfortunately it is impossible to convert a TV without composite video capability to use SCART connections, the hardware is not available. SCART in TVs was originally designed to make a direct video connection between a VCR and TV to provide higher quality audio and visual reproduction than can be achieved by the normal RF connection. To improve your picture quality you have to get a new TV with SCART capability or a dedicated monitor.

GFA Draft to GEM-Metafile Conversion



Mr N C Coles of Weymouth wrote in and said we didn't explain how to convert GFA Draft files to GEM Metafiles using the META.PRG in our introduction to the program in STF 34 – we were a tad



```
screen copy logic to start(10)+64000
50 get palette(logic) : wait vbl
60 for Y=0 to 599
70 look $458,start(10)+Y*160 : wait vbl
80 next Y
90 look $458,0 : wait vbl
```

This program works by taking advantage of the fact that you can set the STE's screen address so as to move it up or down through memory by one line, which is 160 bytes. The system variable at \$458 holds the address of the screen at the next VBL, and can be used rather than PBASIC to set the screen address. One final point, it is very important that you clear the address when your program finishes.

Sprites again

How do I turn off just one sprite on the screen without affecting the others?

Luke Channon, Natland

stf: The best solution is, of course, not to use STOS sprites at all. If you insist however then try the `SPRINT OFF (X)` command which will turn off sprite X without disturbing the rest.

Taken problem

I have had problems using example programs supplied with the STOS extensions on the Cover Disk. The problem stems from having to change the `extender` to one I don't already use which then causes problems with the tokens in the BASIC listing. I have written a program to alter the tokens, – is it likely to cause problems with memory banks?

2. I cannot get the STOS assembler program to disassemble programs with the "Z" directive.

Alan Bartholomew, New Zealand

stf: 1. The easiest solution is to temporarily remove the extension which you don't want to use for the moment, then load in the BASIC file and save it back out as an .ASC file and the memory banks as an .MBS file. Then rename the offending extension and re-install the other one. Now load in the .ASC and .MBS files and the should be correctly unised.

It is rather tedious to rename extensions, however, because it means that every program you receive which uses it has to be put through the above process.

2. As far as we are aware, the assembler doesn't work very well at all. If you can, try to get hold of something like EASYRIDER or BUGABOO which has the effect of making life much easier.

Absolute beginner

Please can you tell me how I'm supposed to get a small part of the Nochrome picture onto the screen just like Chris Lloyd did in his Big Eye demo? I want to try it for myself but can't work it out.

Grant Donald, Kendal

stf: First of all, we would suggest that you re-read your STOS manual with particular attention to the `SCREEN-COPY` command. Here is an example:

```
10 load "pic.neo",back
20 get palette(back) : wait vbl
60 screen copy back,0,0,160,100 :
   to physloc,80,50
```

Programming tips

Finally, here are some more little hints and tips to aid your programming

There is an undocumented command in the Compiler extension called `COMPAD` which, we assume, returns the address of the compiler extension. It can be used to check whether a program is being run within STOS or not like this.

```
10 if compad>0 then print "
   "Inside STOS" else print "Outside STOS"
```

If you are really short of processor time, then you can try using memory banks rather than arrays:

```
10 reserve as work 10,16 : S10=start(10)
20 D1=deek(S10) : D2=deek(S10+2) : J
   D3=deek(S10+4) : D4=deek(S10+6)
```

is faster than

```
10 dim D(3)
20 D1=D(0) : D2=D(1) : D3=D(2) : D4=D(3)
```

Also, remember that `FOR` loops are much slower than writing the commands out in full.

```
10 for T=1 to 10 : X=X+10 : next T
```

is much slower than

```
10 X=X+10 : X=X+10 : X=X+10 : J
   X=X+10 : X=X+10 : X=X+10 : J
   X=X+10 : X=X+10 : X=X+10 : X=X+10
```




STOS CORNER

Billy Allan creeps out to give you his carefully considered answers

Smudged sprites

When I scroll the entire screen while displaying a moving sprite, am I getting a smudge mark across the screen. What am I doing wrong?

Phillip Wellington, Gloucester

stf: Once again, STOS sprites are at fault. When a sprite is drawn on the screen, STOS automatically erases its old image by copying the bit of screen from BACK which was underneath the sprite onto the top of it again. But if you have scrolled the screen first, the bit of background does not match up with the screen so you get a "trail" left behind. There are several ways to solve this problem. First of all, don't use STOS! (Use the SCREEN method described in STF 41 - and see page 66 if you missed that. Also, instead of actually scrolling the screen, you could just redraw the whole screen every time which eliminates the need to restore the sprite backgrounds. Alternatively, you could store the map as a very large "picture." If you have enough memory, and just copy the required piece to screen.

Well sorted

I am trying to sort arrays using the SORT command, but I want information linked with the array to be sorted in the same order. For instance a high-score table with two arrays - one for the scores and one for the names.

Duncan "Ogg" Fawkes, Coldstream

stf: The only way we can do this in STOS is to write a sort routine ourselves. This routine will sort a high-score list the one you describe using a very basic sort algorithm.

```
10 dim NUM(9), NAME(9)
15 c=0
20 for T=0 to 9
30 NUM(T)=rnd(1000)
40 NAME(T)=chr$(65+T)
50 locate 0,T : print NAME(T),NUM(T)
60 next T
70 for T=0 to 9 : for T2=0 to T step-1
```

```
80 if NUM(T)>NUM(T2) then swap
NUM(T),NUM(T2) : swap NAME(T),NAME(T2)
90 next T2 : next T
100 for T=0 to 9
110 locate 20,T : print NAME(T),NUM(T)
120 next T
```

A borderline case



1. Is it possible to remove the borders from within STOS?
2. How do you make the text large and colourful as seen in demo?
3. Where can I get STOS 3D?

Alan Craig, Wishaw

stf: 1. STOS does not enable you to access to the sort of interrupts and timing which are needed to remove the borders. The basic principle is to change to and from different screen frequencies at the correct points in the screen to "tool" the video shifter into drawing the borders. The bottom border is the easiest and most common border to remove. Basically you just wait until the last scanline on the screen, change hertz, wait a bit, then change back again. The top border is much the same, but the right, and particularly the left borders are much more complicated and take a lot of processing time since you have to "open" each line of the screen individually. You have to write the routines in assembly, though, as the following example shows just how bad STOS is at border removal.

```
10 wait vbl : for T=0 to 242 : next T :
poke $FFB20A,0 :
poke $FFB20A,2 : if peek($FFFC02)<57 then
goto 10
```

2. There are various methods of making scrolling texts or "scrollers". The most common is to hold various images of your font and flick between them giving the impression of smooth scrolling while enabling you to actually scroll in steps of 16 pixels. There is an example of a scroller on this month's Cover Disk, so load it up and try it!

3. Your should be able to get STOS 3D from any reputable computer shop or mail-order firm. Try looking through the pages of this month's STF.

STE query

Can you tell me how the STE hardware scrolling extensions work?

Stephen Johnson, Blaina

stf: Hardware scrolling does not enable you to scroll bits of the screen like the SCROLL or SCREEN COPY commands. When you hardware scroll the screen, you scroll the whole screen, not just a part of it. For instance, if you scroll the screen 16 pixels to the right, the screen's address in memory is moved eight bytes up in memory, so the right of the screen may appear on the left of your picture.

Also, when you change the screen size remember that STOS still thinks your screen is 320 pixels wide. If you are copying a 64x64 block with SCREEN COPY it copies the 64 pixels of line one then it adds 160 bytes to the source and destination addresses and starts copying line two. But since the screen is now around 320 bytes wide, the new line is not to be copied to the correct place.

Top Tips

Here's tip from STF reader Martin Cubitt. While using the Maestro command SAMTHRU, you can read in the input from the cartridge by entering "A=peek(\$FB001)".

This tip comes from David Finch of the Network Coding Group. Further to the question from Sam Trent (STF 40), you can check if the disk in the drive is write-protected typing "A=LEER(\$F8)". If A is -1 then the disk is write-protected.

And finally one from us. If you want to save out .MBK files from a memory bank reserved as WORK then you need to add an 18-byte header to the file. This routine adds the header to bank number "X".

```
10 T$="Liospounk" : TAD=verptr(T$)
20 copy TAD,TAD+10 to start(X)
30 loko start(X)+10,X
40 loko start(X)+14,length(X)
50 poke start(X)+14,129
```

you get is a loud distorted noise. Most sample software can convert between the two formats. All AVR samples produced by the Replay series of cartridges are in signed form.

5. Yes.

6. It is always best to contact the company and the individuals involved when sampling from the TV to clear any copyright problems that could possibly arise. Some companies may require a royalty payment which can either be a one-off fee or a share of profits (if any).

Colour me purple



I have a Deskjet 500C colour printer to use with my ST but all I can produce with it at the moment is coloured text using Pro-Text. None of my paint packages work with it, I have Canvas, Degas Elite, AniST, Paintpot and Hyperpaint and none of them can produce a printout. All the software supplied with the printer was for the PC-

contemptible. How can I get my pictures printed in colour?

Joyce Marshall, Cumbria

stf: The program you need is called HPChrome which is a Shareware program designed specifically to print colour pictures from all HP Deskjet printers including the Deskjet Plus, Deskjet 500, Deskjet 500C and 550C. The full version costs just £5 and is available from Rufus Developments, PO Box 562, Wimbourne, Dorset BH21 2YD. The program can print colour Degas and Neochrome files and is supplied with plenty of options - see the review in STF 38.

Get your fax straight



I have the Joppa Straight Fax software which was supplied by HCS. However, I cannot print out any faxes I receive because the program is not supplied with GDOS or a suitable printer driver. How can I get GDOS

and a driver for my Panasonic KX-P1123 printer?

Mark W Preston, Banffshire

stf: Contact the ST Club on #0602 410241, they are registered Atari GDOS distributors and can supply you with the programs, 24-pin printer drivers and full documentation on installation. ST Club also distribute FontGDOS, the updated version of the program, which has many new printer drivers available including inkjet drivers.

Michtron programming



I have the excellent software from Cover Disk 42, but I am a bit lost without the manual because I want to learn how to write add-on modules in the Michtron Command Language (MCL). Can you give me the address of Microdeal so I can send for the manual?

Robert Hays, Berks

stf: The address was in last month's issue but here it is again for those of you who have lost, mislaid or thrown out last month's copy (what?). The manual costs £9.95 from Microdeal, PO Box 68, St Austell, Cornwall PL25 4YB, or give them a call on # 0726 68020. There are only a limited number of manuals available so you had better be quick.

Tip: Music to groove to



If you would like to hear some groovy music on the game Ozzy, which was on Cover Disk 42, simply persuade the program LISA_ADE.PRG to boot before anything else in the AUTO folder.

You can do this by either using a program like Autosoft which was on Cover Disk 20 or just by copying the contents of the AUTO folder to the root directory and then copying them back into the AUTO folder in the order you want them to boot. Cheers to David Dickson of Glasgow for that.

ST ANSWERS

Come dive into the cool, clear waters of knowledge with Clive Parker, while trying not to stir up the muddy silt of ignorance. Send all your problems – well, not all of them – to ST Answers, ST FORMAT, 30 Monmouth Street, Bath BA1 2BW indicating the type of problem on the envelope



For all game tips, cheats and total brain-draining facts turn to Gamebusters from pages 68 to 71

THE ICONS

BEGINNERS

If you don't know one and of your ST from the other, then you might require this type of help – look out for this logo.



COMMS

More and more ST owners are fascinated by the world of modems and communications? Check it all out here.



DISKS

Your floppy and hard disks need to work properly. If you're having problems, we try our best to sort them all out.



GAMES

The best place to look for game cheats is Gamebusters from pages 68 to 71. We do answer other game questions.



GRAPHICS

So much can be achieved in the world of ST art and graphics. If only you know how... well, look no further



HARD DRIVES

If you have one, you want to use it, right? To get the most out of yours, look out for this icon here.



PRINTERS

Does your paper get all tangled up when faced with your ST? It needs counselling. Relax, and tell me about your childhood.



PROGRAMMING

All sorts of programming this month, listings and everything. Brilliant. That is, if you like that sort of thing.



SOUND

Many people can't live without music, so if you're one of them, make sure you keep your gear in order.



ST PROBLEMS

Miscellaneous bits and pieces live in here – so if your problems are vague and woolly, come here.



Sim City, Starblade and Dungeon Master



1. Where can I get a Sim City Terrain Editor and how much does it cost?
2. Is it still possible to buy Starblade and, if so, where on earth can I find it?
3. I was wondering if there is a cheat for Dungeon Master?

Cedric Kerr, Mitcham

stf: 1. The Terrain Editor costs £7.99 and is available from Infogrames (☎ 071 738 8199); 2. Starblade is being re-released in March by Daze Marketing (☎ 071 490 2944), price £9.99; 3. Yes, there is a cheat for Dungeon Master. Read all about it in this month's Gamebusters section on page 68.



STOS STUFF

Billy Allan drops in to take a look at your STOS problems and queries

Flickery stars

stf: 1. I am writing a game which needs a 3D starfield on the left of the screen with a picture on the right with the score and lives. The problem is, my screen keeps flickering! How can I avoid this flickering? I am using screen swap.

2. How can I replay other sample formats using STOS Maestro?

J P Van der Hoek, Netherlands

stf: 1. If you are screen swapping then you must copy your picture to both bak and physica first. When you flick between the two screens with screen swap, and you have only copied your picture onto physica it constantly disappears and reappears every time you use the command. 2. You can replay other sample formats by using Maestro's `WALK` command. If you had loaded a `WALK` sample into bank ten of your program you could replay it like this:

Speed me up before I go go



I am looking for a software accelerator that will work with GFA Draft Plus 3. I have been thinking of getting either Quick ST or NVDI. Which one of these two programs would be best for my purposes? I am limited to £60.

Ian J Morton, Ellon, Scotland

stf: Both of the programs you mention would be suitable for your purposes, although Quick ST has been superseded by Warp 9. NVDI is the more technically advanced of the two, being a complete replacement for the built-in VDI (Virtual Device Interface) routines, speeding up the entire GEM operating system. Other accelerators tend to concentrate on just speeding

up the screen routines. NVDI can be obtained from the Atari Workshop for £39.95 and they can also supply Warp 9 for £29.95, call them on ☎ 0753 832212 for more info.

Rubrik's cube



On the Cover Disk of ST FORMAT 40 (check out page 66 for info on how to get a copy) we gave

you the excellent Rubrik's screen saver utility. The only problem with it was that it would only save its settings to hard drive partition C and not to floppy drive A, this is especially annoying if you have a floppy drive



```
10 click off : sound init
   : soundspeed 10
20 samraw start(10),50000
30 wait key
40 samstop
```

compile it, then you should not run it before compilation.

Power corrupts

When using the `+` (power) operator to get the square of a number, it sometimes gives the wrong result. For instance `a=5 : print a^2` gives 24 rather than 25. Is this a bug, or am I doing something wrong? Using the `PRINT` `A*A` command does give the correct answer.

David Wimbush, Crawley

stf: Yes, shocking though it may be, this does seem to be (yet another) bug in STOS. It isn't a particularly annoying one though, so you can just ignore it.

High speed collisions

How can you make the fastest collision routine possible? What are the variables/binary numbers involved?

Alec McEachran, Lichfield

stf: There are three ways of doing collision detection. The first is to use the

system. The only way around this was to set up the Accessory from scratch each time you boot-up. **Simon Harvey** from **Halifax**, however, has come up with a simple and elegant solution to the problem. There is a Public Domain program called **Divet** which makes your ST think that it is saving to one drive when in fact it is saving to another. Install the program and type in the following:

```
Drive to divert from: C
Drive to divert to: A
```

You can now save your settings to floppy disk. **Divet** is by the **Hitchiker** and is available from **Goodman International** on Disk **GD1816** at £2.75. Call **Goodmans** on 0782 335650.

PC monitor



I have been given an Amstrad mono PC monitor and I wondered if I could connect it to my ST. If I can, could you please tell me the connections and where I can get the parts to make the lead. I have listed the monitor 15-way D-socket connections for your information below.

Gordon Murray, Grangemouth

stf: You have failed to provide us with the model number of the Amstrad monitor so this is inspired guesswork on our part. From your list of connections it seems that the monitor uses composite video rather than separate RGB signals. This means that the monitor only works in low or medium resolution – not in high resolution mono. The only connections required

from the ST are video, ground, H sync and V sync, although the sync signals are not usually used with composite video monitors. Make the lead as detailed below.

Amstrad PC monitor connections	ST monitor socket connections
15-pin D plug	13-pin DIN plug
Pin 2 Video	Pin 2 Video out
Pin 5 Selftest	
Pin 10 Digital ground	Pin 13 Ground
Pin 13 H sync	Pin 9 H sync
Pin 14 V sync	Pin 12 V sync

Remember, these connections are only conjecture. Without the model number we cannot be more specific. Call **Meedmore** on 051 521 2202 and let them know the model number of the monitor and they will make you a lead to order.

ST FORMAT Warning: Never open up a monitor unless you are 100% sure of what you are doing. The high voltages present inside a monitor can kill you even when it is switched off.

Stalling dragons



I recently bought the game **Lure** of the **Temptress**, but it stalls after I have given the potion to the dragon and I'm talking to **Goewin** in the first cave. I own a **1040STE**. What can I do?

Johann Omarsson, Iceland

stf: Apparently there's a bug in the original version of the game. Simply

send back the **Boot Disk** and **Disk A** with a brief note explaining the problem to **Virgin Games**, 338a **Ladbroke Grove**, London **W10 5AH** and they'll send you some replacement disks.

More professional please



I am very interested in **DTP** using my ST and I would like to purchase a program which is more professional than my current **Timeworks** software. Although this program is very good, I need more than it can offer me. I have seen from previous issues of **ST FORMAT** that you highly recommend **Calamus v1.09n**, but I do not have the issue with the review. What would be the minimum system requirements to use this software on a reasonable budget?

B Lock, London

stf: Right, you need at least 1MByte of RAM installed in your machine because **Calamus** does not work with any less. You will be better off with 2MBytes or even 4MBytes of RAM as this enables you to create multi-page documents in memory and store fonts as well. If you have an **STE** then 1MByte SIMMs can be obtained for about £15-£20 if you shop around. If you have an **STFM**, then an upgrade board which uses SIMMs is best.

Calamus is designed to run from a hard drive, but you can use it on a twin floppy drive setup. An external second drive costs around £50-£60 and 40MByte hard drives can now be obtained for under £300. You need a good quality printer. As cost is

a factor in your case, you can disre-gard laser printers because they are so expensive to buy, maintain and run. Output quality is also a consideration, so your best bet would be an inkjet printer such as the **Canon BJ-10ex** or the **Star SJ-48** (both can be obtained for around £200). You also need a high resolution mono monitor, a mono emulator is just not good enough for desk top publishing work – the **Atari SM146** is available for around £120.

Where to get all the gear:

Calamus v1.09n from **Halco** (0734 441525), £140.
Atari SM146 monitor from **Evesham Micros** (0386 765500), £119.95.
External floppy drive from **Evesham Micros** (0386 765500), £52.99.
Canon BJ-10ex from **We Serve** (0705 325354), £199.
Star SJ-48 from **We Serve** (0705 325354), £199.

Progate 40 hard drive from **First Computer Centre** (0532 319444), £289.99.

2MByte XtraRAM Deluxe for **STFM** from **HCS** (071 252 1551), £79.99.
2MByte of SIMMs for **STE** from **HCS** (071 252 1551), £44.99.

That's champion



I have recently bought **Domark's 1MByte version** of **Championship Manager** and about halfway through the first season, the game crashed out and would not let me go any further. I returned the game and got another copy, but the same thing hap-

collide(x) command, where **x** is the **STOS** sprite you wish to check.

```
10 A=collide(1)
20 for T=0 to 15 :1
  if btest(T,A)1
    then print "Hit sprite":T
30 next T
```

The other ways are not specific to **STOS** sprites. If you want to check for a collision between two equally sized objects then the following works, assuming both objects are 16x16 pixels.

```
10 if abs(X1-X2)<16 and
  abs(Y1-Y2)<16
  then print "Collided!"
```

If you want to check for a collision between two objects of differing sizes, then this works, assuming a 32x20 and a 64x64 object.

```
10 if (X1-X2>64 or
  X1-X2<X2)
  and (Y1-Y2>64 or
  Y1-Y2<Y2)
  then print "Collided!"
```

Jiggling balls

I am currently writing a game in **STOS** for which I need a routine which enables a ball to bounce around the screen and interact with other sprites and parts of the screen. I also need some music transferred from manuscript form into a form which **STOS** can understand and play.

S W Angell, Thornaby

stf: This little bouncing ball routine should work OK. We've used a **STOS** sprite for readability, but you should change it to use the screen's method.

```
10 X=100 : Y=0 : SX=4 : SY=0
20 repeat
30 sprite 1,X,Y,1
40 X=X+SX : if X>300 or X<4
  then SX=-SX
50 if SY<19 then inc SY
60 Y=Y+SY : if Y>184
  then Y=184 : SY=-SY
70 update : wait vbl
80 until inkey$=""
```

There are no programs generally available which can do exactly what you

want. We can only suggest that you get to grips with the **STOS** music accessory, or try to get hold of a PD music definer like **Megatizer**.

Open sesame

I have just written a password program, can I display asterisks when the user tries to enter a password?

Daniel Morris, Polden Meadows

stf: This program ought to do the job.

```
10 P$="ST Format": I
  L=len(P$): N=1
20 print "Enter the password:"
30 repeat
40 repeat : GS=inkey$: I
  until GS=""
50 print ""
60 if GS=mid$(P$,N,1) then end
70 inc N : until H>L
```

Back up problems

1. When I use the **STOS** Copy accessory I get an error message. Can you help?
 2. I am having trouble getting the

menu command to work. Please help.
Jammy Broom, Langley Moor

stf: 1. You are a little vague, but the easiest solution is to make your copy of **STOS** from the **Desktop** rather than using **STOS** Copy. 2. Try this out:

```
10 menu$ (1)=""STOS "
20 menu$ (1,1)=""STOSCOPY"
30 menu$ (1,2)=""MENUS"
32 menu$ (2)=""HELLO "
33 menu$ (2,1)=""MENU"
34 menu$ (2,2)=""THERE"
40 menu on :
50 on menu goto 80,120
60 on menu on
70 goto 70
80 MS=msselect
90 if MS=1
  then print "STOSCOPY"
100 if MS=2 then print "MENUS"
110 goto 50
120 MS=msselect
130 if MS=1 then print
  "Hello menu!"
140 if MS=2 then print
  "Hello there!"
150 goto 50
```


by repeated saving and deleting over a period of time? I have the Michtron Hard Turbo Kit which optimises a hard drive by making all the files contiguous and complete. While this worked with my old Seagate 30MByte drive, it does not work properly with my new 52MByte Quantum with an ICD host adaptor - I get an alert saying "Serious Error message - the FAT copies do not match." I'm not sure, but I think that the Michtron program is too old to cope with the newer host adaptors and drives. Do you know if there is an equivalent to PC Tools for my ST?

Chris Barker, Thetford, Norfolk

stf: There is an excellent new program from HiSoft called Diamond Edge

which does exactly what you're looking for. It can optimise, back up, protect against viruses as well as a host of other functions. If you fancy finding out more, see the full review on page 82. You can also contact HiSoft on = 0252 718181.

Indiana Jones and the missing data mystery



About three years ago I bought Indiana Jones: the Graphic Adventure and what a buy! A truly stonking game. Unfortunate circumstances, however, meant I couldn't back up the disks - as it says to do in the manual. One thing led to another and, well, Disk Two is fine until you try to enter the catacombs at which point the error

"Data on disk in drive A may be damaged" comes up. After three years, I no longer have proof of purchase other than the original packaging. Do you know how I can get a set of replacement disks?

Jamie Wickinson

stf: Unfortunately, Jamie, the only solution is to buy yourself another copy. US Gold are unlikely to help because your version is so old, but you could still try grovelling by giving them a ring on = 021 625 3366.

Spanish ayes



Is there any way of using Write On for the Spanish language and with a Spanish ST keyboard? Can ST FORMAT be

translated into Spanish? I understand English but have trouble with some of the technical words that you use in your magazine.

Enric Aloy i Bosch, Espania

stf: Write On only exists in English and German and supports Norwegian, Swedish, French and Dutch keyboards. For Spanish, Compo can give you information on how to configure your own key table. To get this you need to register your copy of Write On - £7.50 for one year or £15 for life. Write to them at Compo Software, 7 Vinegar Hill, Alconbury Weston, Huntingdon, Cambridgeshire, PE17 5JA, United Kingdom. We're sorry, but we can't translate all the technical bits 'cos we would have to do the same in all other languages.

■ "Do you, Indiana Jones, take this table to be your lawfully-wedded wife?" "I do." "Don't blame you, she's got great legs."



STOS MATTERS

If you keep getting your STOS in a twist, turn to Billy Allan for the solution

Distorted sprites

When I move a sprite across the screen it appears to distort when its Y coordinate crosses 80. What is going wrong?

Shaun Callahan, Stochley

stf: The problem is caused by the sprite being displayed at the same place where the electron gun, which draws your TV picture, is updating the screen. When this happens, the part of your sprite above the gun is still displayed at its old coordinate, while the part below is drawn at the new coordinate.

You can avoid this happening by using the `SCREEN` command to swap between the two different screens so that your graphics are only updated when the electron gun is off the top of the screen.

Is it art?

I am writing an art package but I can't get it to overlay shapes on a picture without erasing a block around the shape. Can you help, please?

Ben Riley, Accrington

stf: The solution to your problem is to store the image you want to display as a `SCREEN` block. This listing should give you the general idea.

```
10 key off : hide : cure off : mode 0
20 reserve as screen 14
30 dim BRUSH$ (15)
40 logic-back
50 WID=0 : HIG=50
60 ink 9 : bar 0,0 to WID,HIG
70 for X=0 to 15
80 BRUSH$(X)=screen$(logic,0,0)
to WID+1,HIG)
90 screen copy logic,-1,0,WID+15,HIG,
```

```
to logic,0,0
100 ink 0 : draw 0,0 to 0,HIG
110 next X
120 for T=1 to 30 : ink rnd(14)+1
130 bar rnd(319),rnd(199) to J
rnd(319),rnd(199)
140 next T
150 screen copy logic to physic
160 screen copy logic to 14
170 repeat
180 screen copy 14 to logic
190 X=x mouse-(WID/2) : Y=y mouse-(HIG/2)
200 screen$(logic,X and $FFFF,Y)=BRUSH$(
(X mod 16)
210 screen map : wait vbl
220 until mouse key=1
```

Printing problem

I have written a machine code program which prints a message on the screen. When I call it from STOS it appears in the wrong colours and overwrites the screen, ignoring the current cursor position. What is going wrong? Also, can you tell me where to get a cheap list of all the 68000 instructions?

Mike Bernard, Worthing

stf: This occurs because STOS has its own text routine which is completely separate from the TOS routines, so any STOS formatting you do to text will be ignored by the operating system. You can however print a string by calling STOS's own trap routine like this.

```
print: lea mess,a0
moving $1,d7
trap #3
rts
mess: dc.b "Hello!",0
```

You can find the rest of the trap routines at the back of your STOS manual. If you want a list of the 68000

instruction set then try getting your library to get in Atari ST Internals which is published by Abacus.

Floating into the night

I am writing an accounts package, but STOS seems to get some of the floating point calculations wrong. What is going wrong? Also, I am using `PRINT #` to save the records to disk but I am having difficulty checking if the disk is running out of space while saving. Can you help?

Frederick Burnett, Preston

stf: To stop STOS rounding floating point numbers incorrectly you should use the `FIX` command to set the decimal precision. If you add `FIX(15)` to your program it stops this problem re-occurring. To check for the disk filling up you should use the `ON ERROR` construct. This little example should give you the basic idea.

```
10 on error goto 1000
20 open out #1,"file.dat"
30 for T=1 to 50000
40 print #1,"HELLO"
50 next T
60 close #1 : end
1000 if error=5 then print "Disk is full!"
1010 boom : resume 60
```

Compatibility

I have read a lot about the new Falcon computer in computer magazines recently. Could you tell me if STOS is compatible with it?

Brian Marker, Bournemouth

stf: We tried STOS on a Falcon and it works fairly well, along with most other software. Remember, though, you have to disable the memory cache to run these programs. STOS has the same problems it used to have on the Mega STE with the mouse corrupting but otherwise it runs perfectly well.

Copying to the root directory



1 Format a disk and mark it as Disk B. Go to the Options menu on the Desktop and select Preferences, now select medium res. Mark the backup copy of your Cover Disk as Disk A - place it in the drive.



2 Double-click on the Drive A icon so that the window opens and you can see the folders, double-click on the BABY JO folder so that you can see all the files within, there should be 37 files altogether.



3 Click on the box at the top right of the window and the window fills the screen. Use the small box in the bottom right corner to make the screen narrower and move the window to the right till you see the icons.



4 Move the pointer just above the first file. Press the left mouse button and keep it pressed drag a box over all the files in the window, then release the button. The files turn black, meaning they are selected.



5 Move the pointer over the file nearest the Drive B icon, press and hold the left button and move the pointer over the Drive B icon. Your ST starts copying all the files and prompts you when to swap disks.



6 Follow the instructions till all the files have been copied. Now click on the long bar on the right so that all the files scroll up. Drag a box over the bottom two rows and drag them to the Drive B icon.

in a folder to the root directory of a blank disk - *Baby Jo* on Cover Disk 30 is one example. I am a beginner and don't know what this means or how to do this, could you please describe the procedure?

James Potter, Oxford

stf: Copying to the root directory means that the files are not in a folder on the destination disk and you can see them as soon as you open a drive window. Remember to use the Backup program supplied on our Cover Disks to make a copy of all your disks. Always work on a backup copy and not on the original Cover Disk - you don't want to lose any of those brilliant programs. On a single disk system the procedure is as shown in the walkthrough (see boxes, left).

Another DC question...

I am after DC Showit from Double Click Software to use with NeoDesk 3, but I have not seen any adverts for it, where can I get it from? I have also heard that Double Click Software are no longer trading in the US, does this have any effect on the availability of DC utilities?

Ross Burton, Stansted, Essex

stf: Double Click have ceased trading, and as far as we have been able to find out, all Shareware is still available from PD libraries. We do not know the status of their commercial products such as DC Desktop, DC Data Diet and the DC Port, but we do try to print any news we get concerning Double Click.

STF plea: If anyone has a DC Port they no longer want then please contact ST FORMAT on 0225 442244. We need it to add an extra line to the ST FORMAT BBS.

GDOS bother

I have Timeworks 2 installed on my hard drive and I have encountered problems

when using other programs if GDOS is installed. I have an STE and have trouble with several programs when GDOS is auto-booted - this includes the VIP Professional spreadsheet and STDCAT 4; both programs bomb. Is there a solution to this problem so that I do not have to disable GDOS manually and re-boot every time I want to use these programs?

John Connors, Exeter

stf: What you need is a boot manager program like the commercial X-Boot 3 utility (STF Rating 91% - STF 45) or Superboot 7.4 from ST FORMAT Cover Disk 36. Both of these programs enable you to select which AUTO folder programs and Desk Accessories you wish to run whenever you boot-up your machine. This type of utility is vital for hard drive systems, because if you add a DA or AUTO program which causes your system to crash, it is practically impossible to access the hard drive to delete the offending program. X-Boot 3 is available from HiSoft (0525 718181) for £34.95 and you can get Superboot by turning to page 44 and ordering issue 36, unless you have it already, of course.

Old man of computing

At the ripe old age of 30 I have bought a 1040 STE, and although I am very pleased with the games I have bought, I would like to get a better understanding of the more serious side of computing. I do not know the first thing about computers because when I



STOS SELECTION

In desperate need of some STOS help? Billy Allan helps where others have failed

Don't interrupt

Could you tell me how to install interrupt vectors in memory so that they stay on once you quit to the Desktop? Shaun Flynn, Plymouth

stf: Unfortunately, STOS does not let you write this sort of program (called TSRs). If you know enough 68000 to write interrupt routines you should be able to write it in assembly using the GEMDOS function Ptermem() which does the job.

Reading directories

I am writing a program where I need to read in all of the names and sizes

of the files in a directory. My problem is that the program treats folders as files and tries to load them in, resulting in an error. I am using DIR FIRST\$ and DIR NEXT\$ to read the directory. Can you help?

Brian Scobie, Manchester

stf: The easiest way of filtering out folders is to check the attributes which are returned after a call to DIR FIRST\$ or DIR NEXT\$. The attributes are held at position 42 of the returned string. This program reads in a directory, ignoring all the folders.

```
10 dim NAMES(112), SIZE(112)
20 FS=dir first$("*.*", -1)
30 To=0
40 while FS<>""
50 if val(mid$(FS, 42, 3))=16:
    then goto 100
```

```
60 NAMES(T)=left$(FS, 12)-" "
70 SIZE(T)=val(mid$(FS, 13, 8))
80 print NAMES(T), SIZE(T)
90 inc T
100 FS=dir next$
110 wend
```

No sex please...

I have made a sample sequence from various looped samples. It plays back OK in the sampler, but when I try and use the routine which came with it for STOS, there are clicks between the samples. How can I stop these?

B Norton, Malton

stf: The easiest way is to call the playback routine for the next sample in the sequence just before you would normally do so. For instance, if you were playing a 5K sample you would start the routine

for the next one during the 4th Kilobyte of the current sample.

Extended courtesy

Could you please tell me how to use the STE's soundchip and how to do palette-splitting and border removal? Could you write an extension to do this for me?

S Cotton, Cornwall

stf: If you want to do this sort of thing then you have to learn assembly language. There are many free sources of information about these subjects in the Public Domain - have a look on page 90 for suitable PD libraries. We're afraid that we have one or two other things on at the moment which prevents us from writing you an extension. Still, it doesn't hurt to ask...

was at school, computing was not a subject available to anyone! Have you any ideas about manuals or programs I can buy to help me understand a bit better? Could you also tell me why some disks I put in the drive cause the message "drive not responding: please insert disk" to come up? It is very annoying.

J West, Gravesend, Kent

stf: We're not quite sure if you want to learn about your ST in particular or about serious applications that you can use on your ST. If it is your ST you want to find out more about, try Your Second Manual to the Atari ST from the ST Club (£7.95 = 0602 410241) or The Atari ST Explored from Kuma (£8.95 = 0734 844335), they can both help you to understand your machine. If you want to find out more about some of the serious software your ST can deal with, then turn to page 18 for our feature on the serious side of computing on your ST.

Your disk problem is probably caused by putting non-standard formatted disks in the drive, in other words games disks! Most games disks are formatted in a special way to prevent copying and can only be read when the machine is booted-up; they cannot be read from the Desktop by putting the disk in the drive and clicking on the Drive A icon.

Prince of pokés



How do I use the cheat on Prince of Persia? Apparently, it involves making changes to my save game file. How and in what circumstances would I use pokés?

Steve Hill, Middlesex

stf: The easiest way is to make a backup of your save game disk and then edit it using a disk or file editor,

READ MY TIPS

Sticky business



On reading an ancient issue of ST FORMAT, I have noticed that people have trouble removing disk labels. There is a chemical called Isopropyl Alcohol which can be obtained from most chemists for about £3.75 for 500ml, this is also known as head cleaning fluid. When applied to disks this enables the labels to be removed in one piece nine times out of ten, and you can even re-use them.

P Vincent, Lowestoft, Suffolk

stf: Just be extremely careful not to get the Isopropyl Alcohol into the disk casing when peeling off the unwanted label - this is not the friendliest of liquids to treat your disk to.

such as MEMFILE 2.0. Alternatively, you can ALWAYS check out the tips in ST FORMAT 37, just turn to page 44 to order your copy. The only other piece of advice we can offer is that

Write On tip no. 4581



Mr Régis Granoff of Argenteuil in France has this clever tip for using C-Font from within Write

On v1.0 on a ST2K machine with the help of M-Disk (yours free on STF Cover Disk number 44).

1. Copy M-Disk onto your working copy of your C-Font/Write On disk.
2. From the Desktop, install a 100-150K virtual disk using M-Disk.
3. Run Write On.
4. Remove the RAMDisk from the Accessory. You now have a sufficient amount of RAM to convert your Calamus fonts.
5. Use C-Font Accessory.

Now you can test your freshly converted fonts and use them without the pain of having to leave Write On every time you want to use C-Font.

Beware the Snatcher!



David Dickson of Newlands in Glasgow has a handy tip for all graphic package fans.

"The Screen Snatcher program on Cover Disk 44 works with most programs and applications but it does not function with games. To grab an intro screen from a game, press reset when the picture appears and then insert your backup copy of Cover Disk 44 in the drive. Run Screen Snatcher and then take a picture of the Desktop when the program has booted. Press <F1> to see the picture and use <Ctrl Home> and <Insert> to scroll around to find the picture you want. The colour palette may not be correct but this can soon be sorted out in an art package. This method also works with auto-booting games."

backup of the .PRG file before you start messing around with it, otherwise you could corrupt the data. If in doubt, don't do it.

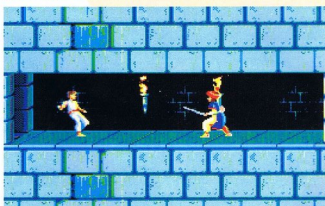
HD positive?



Can I use high density disks in a normal 720K disk drive if they are formatted as normal from the Desktop? Do I risk data loss or damage to my drives?

C Charles, London

stf: Although you can use HD disks formatted to 720K, there is a risk, as you said, of losing data. This is because of the denser magnetic coating on a high density disk which cannot be formatted correctly by the heads of a 720K drive, the magnetic field generated is just not strong enough. The disk may well work at first, but after a while it may lose data. The drive though, should not be damaged by the disk.



■ "Is that the Sultan's scimitar or are you just pleased to see me?" "You're going to die the death of a 1,000 not living things for that joke at my expense." "Made you laugh though, didn't it?"

Speed freak

I am in the final stages of writing a Boulderdash type game, but I have a problem - the game is very slow. It currently updates once every 3.5 seconds. The main loop checks through each element of a 32 by 32 array which is the main reason for the slowness. Would the Compiler speed things up? Also, do you have any tips on adding inertia to sprites?

John Levan, Yorkshire

stf: Get the Compiler (£20.99 from Mandarin = 0625 859333). The main speed increase it gives you is in dealing with loops so your program should benefit. You should also keep an eye out for a new extension extremely useful for this sort of problem may appear on the Cover Disk soon. This little BASIC routine should demonstrate how to add inertia

to a sprite. It assumes you have a STOS sprite bank loaded into memory.

```
10 X=0 : Y=0 : SX=0 : SY=0
20 MX=12 : MY=12
30 sprite 1,X,Y,1 : update
40 X2=X : mouse : Y2=Y : mouse
50 IF X<0 AND SX<MX THEN INC SX
60 IF X>MX AND SX<MX THEN DEC SX
70 IF Y<0 AND SY<MY THEN INC SY
80 IF Y>MY AND SY<MY THEN DEC SY
90 X=X+SX : Y=Y+SY
100 wait vbl : goto 30
```

TOS problem

I've written a program in STOS and I'd like to make it run from the Desktop. I've made up a disk using the STOS Copy Accessory and saved my file as a .PRG file, but when I run it I get an alert box saying "TOS ERROR

#35". What is wrong and what can I do to sort this out?

Graham Fereday, Reading

stf: The only thing we can think of is that you have forgotten to copy your BASIC file into the STOS folder before running the program. We would recommend that you get the Compiler rather than use this method though, as your program runs faster and you don't need to copy the whole STOS folder around with your program.

Groot free area

Could you please tell me if there is a quick way to fill the screen with a tile? I am currently using SCREEN COPY and a double FOR...NEXT loop to copy each tile up.

Andrew Brown, Leicester

stf: By far the quickest method is to take advantage of a bug (or as we call it - a "feature") in the SCREEN command which is in the Misty extension - yours! If you didn't miss STF 38 'cos it was on the Cover Disk this "feature" means that if you copy a bit of the screen over itself, either right or downwards, it leaves a trail of the image around the screen. This routine should demonstrate the principle.

```
10 ink 1 : box 4,4 to 12,12
20 screen 1,logic,0,0,304,16,1
   logic,16,0
30 screen 1,logic,0,0,320,183,1
   logic,0,16
```

This copies a 16 x 16 pixel block from the top-left corner all over the screen. Line 20 drags the block to the right, then line 30 drags it downwards.



STOS CORNER

Billy Allen solves some of the mysteries that surround STOS programming

Sluggish scrolling?

In the game *Slug 2092* there is a colourful scrolling screen, how do you do this? There is also a scrolling text reader. How do I write one of these? When I save a picture in the middle of a Fade the palette is always blank, how can I stop this?

Shayne Jennings, Godmanchester

stf: The routine in *Slug* was written in assembly language, but this little STOS routine gives a similar effect.

```
10 key off : hide :
   cure off mode 0
15 palette 0,0
20 reserve as work 10,1024
30 B=2 : G=1 : B=1 :
   SB=1 : DB=1 : SB=1
40 for To=0 to 65
50 doke start(10)*T+R*256+J
   O*16+H
55 doke start(10)*T+R*2+R*16+G
   B=H+B : if B>6 or R>16 or G>16
   then SB=SB
56 G=H+G : if G>6 or B=1
   then SB=SB
57 B=H+B : if B>6 or B=1
   then SB=SB
70 next T
75 for To=100 : print J
   "ST FORMATS" : next T
80 CL=STPR240 : SIO=ststart(10)
90 for To=0 to 404 :
   step 4 : loke CL,leakJ
   (SIO*2) : next T : waitJ
   vbl : goto 90
```

The way to run this routine is to copy the file directly from a memory bank to the screen using *PEEK* and *POKE*. It also uses the *GROUP* command from the *Misty* extension to scroll the screen as *SCREEN COPY* is too slow.

```
10 key off : hide :
   click off : mode 0 :
   cure off
20 if length(5)=0 then J
   reserve as set 5,char1anJ
```

for the ST, for £1 plus a stamped addressed envelope they can replace your non-working program.

Soft TOS?



Is TOS 2 available as an Auto folder program rather than a hardware upgrade – a friend of mine insists that he knows someone with this program. If there is such a thing available, where can I get it from? If it isn't, where can I get a hardware upgrade for my ST?

Douglas Sopp, Bournemouth

stf: There was a pirate pre-release version of TOS 2 circulating on disk a few years ago and this sounds like

```
(1) : charcopy 1 to 5
30 if length(10)=0 then goto 60
40 reserve as data 10,2000
50 for To=0 to 1999 : J
   poke start(10)*T,J
   rnd(25)+65 : next T
60 SIO=ststart(5)+264 : J
   SIO=ststart(10)
70 B=0 : DB=1 : SB=2 : J
   logicback
80 rem: Main loop <
90 for To=0 to 7
100 loke 1,physio,0,1,320,J
   200,logic,0,0
110 DB=logic+31840
130 X=0 : for To=0 to H+39
140 P=peek(SIO*2)+32
150 V=peek(SIO*P*2)
160 poke SIO+X,V
170 X=X+8 : ewsp SX,SB : J
   next T
180 screen swap : wait vbl
190 next Y
200 SX=1 : SX=7
210 B=H+40 : if H>1999 then H=0
220 if inkey<" " then goto 90
230 default : end
```

To ensure that the palette is correct, you have to add to get palette (logic) : wait vbl to your program just before you save the picture.

Mask of the red death

I am writing a program which enables me to load in files via the file-selector. The thing is, I want to use the extension of the currently selected file as the search mask of the selector. Can you help?

Edward Freeman, Birmingham

stf: The easiest way to do this is to use the STOS commands *INSTR* and *MID\$*. *INSTR* is used to search for the occurrence of one string within another and *MID\$* is used to grab characters from a string. This program keeps displaying a fileselector, getting a new mask each time.

```
10 MSG$="**"
20 F$=file select(MSG$,J
   "Select a file",4)
```

what your friend has. Because it was a pre-release version of the operating system, it is not complete, that means that there is a high risk of data loss when accessing hard and floppy drives. There is no official software version of TOS 2.06 available from Atari. If you want an excellent TOS 2.06 hardware upgrade for your STE then we recommend the T-Board 68 from Compo Software (0480 891819). For more information, check out our feature on TOS 2.06 upgrades starting on page 31.

Screen savers



I have seen a number of screen savers that blank the screen on the ST, but I have seen none to

```
30 if P$="" then end
40 I=instr(" ",P$)
50 if I=0 then goto 20
60 MSG$="**"&mid(P$,I,4) :
   70 goto 20
```

Unexpected caller

I have written several small assembly routines which I wish to call from STOS using the *CALL* command. Unfortunately, one of them requires more parameters passed to it than are available with *DREQ* and *AREQ*. Is there any easy way around this problem?

James Bright, Perth

stf: Probably the easiest way around this is to use an array to hold the parameters and pass its address to your program using the *VARPTR* command, which returns the address of a given variable. For example, if you needed 20 parameters then your STOS program would be something like this.

```
10 dim PRM(19)
20 for To=0 to 19
30 PRM(To)=rnd(100)
40 next T
60 areg(0)=varptr(PRM(0))
70 call 15
```

Now to read out the parameters in your assembly routine, just keep moving long words (four bytes) from *AO*.

```
prog: move.1 (a0),d1 etc...
```

And finally

As you know, if there is a BASIC file called *AUTOEXEC.BAS* in the root directory of the disk you run STOS from, it automatically loads and runs. However, STOS can also auto-run any other BASIC file providing you install it as an application. To do this, highlight *BASIC207.PRGM* on the Desktop. Now go to the Options menu and select *Install Application*. Where it says "Document type" enter *BAS* and click on *Install*, then save your Desktop. Now when you double-click on a BASIC file, STOS automatically runs and executes it.

compare with the offerings on my friend's PC which has logos and lines whizzing about when it idles. Is there anything similar for the ST?

P D Burkin, Hockley, Essex

stf: There are screen savers around for the ST, several of which we featured in our *Matching Tie and Handkerchief Desk Accessory* feature in STF 44. The four we featured were *Rubiks* (on Cover Disk 42) which turns the screen into a sliding puzzle, *Idle* which turns the screen into a starfield with a bouncy Fuji symbol wandering about, *Stars* and *Starstruck* which both turn the screen into a small version of the *Starship Enterprise* viewscreen with stars rushing toward you from the centre of the screen. All of these are available from

any of the PD libraries featured in the directory on page 95.

Dark torch



I have an ST and a Seiko-sha SL 92 printer. Although I can print text perfectly from within word processors, I cannot print graphics from art programs such as *Degas Elite* and *Deluxe Paint*. When I press <Control> and <Help> all I get is a dark band, what is the problem?

A M Gomes Sousa, Portugal

stf: Your first problem is that you're using the wrong key combination, it's <Alternate> and <Help>, not <Control> and <Help>. Secondly, this only works as a screen dump when used in combination with 9-pin Epson printers. Have a look at your printer manual to see what emulations your printer is capable of and set it up for Epson or IBM emulation. This is usually done by altering DIP switches. All Seiko-sha printers have Epson emulation built-in. You can then use the *Print* option from within your graphics program to select the appropriate Epson driver and produce a printout.

Unknown to mankind



A friend has given me an old printer made by Transal Communications Ltd, a Comprint model. It is a parallel 9-pin dot-matrix printer but I cannot get it to work with my 1040 ST. I know the printer works because I have tested it on a friend's PC, why won't it work on my machine? I have no manual to help me. Do you know where I can contact Transal?

R H Johns, Plymouth

stf: After extensive enquiries, including hiring a private detective (well, not quite), we have been unable to trace Transal. However, your best bet is to find out what printer driver your friend is using on his PC and choose the same driver from within your applications. If this fails, then all you are unfortunately left with is the process of trying all printer drivers until you find the one that works.

Missing characters



I use 1st Word Plus v2.02 and I am having problems with selecting foreign characters for my Spanish assignments.

In 1st Word, all the characters I need to use are all displayed in a large box, although this is present in 1st Word Plus, the characters I need to use are not. I also need the medium resolution fix for my STE.

Syntronix info

Could you please give me the address and phone number of the people responsible for the Syntronix Editman Super VHS you mentioned in STF 44? **Salomon Bomberg, Amsterdam**

stf: Syntronix are based at Burlington House, Prime Industrial Park, Shaftsbury Street, Derby DE3 8YB. Their number is ☎ 0332 298422.

Musical labels

Is there a program that prints labels for music cassettes? I have some PD software but it only prints cassette inlays. I need to print continuous labels with the name of the band and the title of the music.

John Cox, London

stf: There is no program available that does this as such, but there is a simple solution to your problem. All you need to do is write a small routine in GFA Basic (or similar) using simple `!print` commands. The distance between the top of one label and the next is usually 12 lines, all you need to do is experiment until you get it right. You can use printer control codes (listed in the printer manual) to set enlarged, bold and italic text or the printer's internal fonts using `!print Chr$(x)` commands, where `x` is the Escape code. The routine should look something like this;

```
For a=1 to 100
  (the number of labels to print)
  !print
  (blank line at top of label)
  !print "The Running Dogs"
  (name of band)
  !print "Once more..."
```

**GFA BASIC**

Come rain or shine, Mac Mardon is always here to answer any GFA Basic queries you may have

Dumping ground

I am using GFA v3.5 to learn and develop programming. As a beginner to programming I find the command `DUMP` very useful for debugging but I have some questions about it.

Is there any way to hold the screen to prevent the list scrolling out of sight? Can I direct the `DUMP` command to place the output to the `DUMP` listing variables that are no longer used?

Ian Pentland, West Sussex

stf: Well, Ian, we have been unable to stop the scrolling ourselves. We get around this problem by writing the information to a file which is then written to disk, use the command, `DUMP TO "A:\DUMPINF.DMS"`.

round the block"

```
(title of tape)
!print (blank line)
!print (blank line)
!print (blank line)
!print (blank line)
!print (blank line)
!print "produced by..."
STP Records"
(info line)
!print (blank line)
!print (blank line)
!print (blank line)
```

Next a

Dead machine

I have a 520 STFM that no longer works. When I switch it on the drive doesn't run and the screen fills with garbage. I can't really afford to get the machine fixed professionally, is there any cheap way of getting it fixed?

Mike Oakes, Devon

stf: Unfortunately not. There are no shortcuts to fixing a dead ST unless you're very technically minded and know exactly what your ST's mode of. Most repair centres have a fixed repair rate, with certain limitations, so you're going to have to save up. Ladbroke Computing International have an excellent repair service with a minimum charge of £35.25 plus parts. Call them on ☎ 0772 561071.

True colour?

Is it true that by using a standard VGA or SVGA colour monitor I can obtain all of the Falcon's resolutions and colours? Do I have to worry about things like multisync or is this mode standard in a VGA monitor?

Steve Davies, Mid Glamorgan

**STOS CORNER**

So, you're writing a program, and you're stuck on a crucial section. Don't worry, just put it to Billy Allan

Bouncy bounce

I am trying to produce an effect whereby a control panel "falls" from the top of the screen down to the position I want it to be on, but I cannot get it to work. Please could you help.

Brett Grace, Australia

stf: Try this little routine. It makes a 320 by 48 pixel panel bounce from the top of the screen and come to rest at the bottom of the screen.

```
70 key off : hide : J
   curs off : mode 0
20 reserve as screen 14 : J
   cls 14
30 cls start(14),1,0,0 : J
   to 320,48
40 logic=back
50 Y=50 : OLDY=Y : SY=0 : J
   DESTY=152
60 rem: main loop <
70 screen copy J
   14,0,50,320,98 to J
   logic,0,OLDY
80 OLDY=Y
```

stf: A colour VGA monitor displays all of the possible Falcon resolutions including the three standard ST modes, although at the highest resolution (640x480) only 256 colours can be displayed on-screen at once. VGA monitors are not multisyncs and should not be confused with them – a multisync monitor is designed to be switchable between many frequencies while a VGA monitor runs at a single fixed frequency. This means a multi-

```
90 if SY<12 then inc SY
100 Y=Y+SY
110 if Y>DESTY then Y=DESTY : J
   : SY=1-SY : if SY=0 : J
   then end
120 screen copy
14,0,0,320,48 to logic,0,Y
130 screen swap : wait vbl
140 goto 70
```

Audio problems

I have recently purchased Audio Sculpture, but I cannot get the replay to work in STOS. Whenever I run it I get a bus error.

David Turner, Longleton

stf: I'm afraid to say that there isn't a lot you can do – all of the replay routines supplied with Audio Sculpture are faulty. All we can do is suggest that you write directly to the authors of the program or else try something like the STOS Tracker extension or The Gap tracker replay routine, both of which you can get from most PD libraries.

The missing extension

I have written some games in STOS which I now want to compile, but whenever I try all I get is

sync operates with different output rates making it compatible with different machines and graphics standards.

Small and hard

How do I format my Falcon's internal hard drive? Can I do this from the Desktop or do I use a program supplied by Atari?

Mick Farren, Co Durham

Then we can read the result in a text editor, or send it to a printer. The command to send the result from the `DUMP` command straight to the printer is, `DUMP "" TO "PRN:"`.

Yes, you can remove variables from the `DUMP` listing. If you save your program with the `SAVE.A` command, then `MERGE` it back into the interpreter, all redundant variable names are then erased permanently.

Time waster?

I want to write a program which involves loading 40 or more compressed Degas pictures, digitized from video. These need to be loaded into memory, then each screen needs to respond to MIDI note on/off messages to call up the picture. I have 1MByte of memory. How many compressed Degas screens fit into 1MByte of RAM? Because of the number of pictures

involved in my program, would there be any room to program a simple type of MIDI file sequence player?

Robert Sixsmith, West Yorks

stf: The number of compressed pictures that fit into 1MByte of memory varies, it's a bit like asking "how long is a piece of string." Compressed Degas files differ widely in size, from as little as 6K to over 24K per picture, making the memory needed anything from 240K to 960K for the number of pictures you want to use.

As for the MIDI file sequence player, the answer is the same, MIDI files can be any size depending on the amount of data stored in them. The best way to plan a program is to sit down, turn the computer off and work it all out on paper first. Everyone likes to go straight to the coding, but working everything out on paper before hand saves time. For example, if you have graphics to be drawn in your program, put them down onto

an error saying "Extension not present in line 10,000."

Derek Payne, Codsall

stf: This error occurs when you have an extension installed in your STOS folder, but not in the Compiler folder. There should be a list of files in your STOS folder with the extensions ".EX?" and a matching set for the compiler with the extensions ".EC?". So it should be a simple matter to find the missing Compiler extension and put a copy of it into the correct folder.

Hidden information

Are Mandarins going to be producing a version of STOS for the Falcon? I noticed while using Knife ST, that I could hide files. Would I still be able to load them in from STOS?

Colin Ballantyne, Balloch

stf: It is a little difficult to get any specific information from Mandarin Software, but we have heard a rumour that a Falcon version of AMOS Professional, the enormously successful version of STOS implemented on the Amiga, is being developed. You can still access hidden files

from STOS as long as you know the file and pathname to enter in your load command 'cos they won't show up in fileselectors or a directory listing.

A musical type

A few issues ago, you printed a listing which would play back Mad Max music on interrupt. Could you tell me how to play other types? Also, is there any way to stop my ST resetting every time I erase a memory blank?

Stuart Ferguson, Finhorn

stf: To play back music you need to know the correct offset to jump to every vertical blank. Here's the basic idea for the most common types.

```
10 COUNT_Z=6
11 MAD_MX=8
12 BIG_ALEX=4
13 LAP_MAD_MX
14 TAO=BIG_ALEX
15 MEGATITE_MAD_MX
19 rem= Main program <
20 OFFSET=COUNT_Z
30 dreg(0)=1: call J
    start(10): wait vbl
40 lobe $4D2, start(10) J
    +OFFSET: wait vbl
50 repeat : until inkey$=" "
```

60 lobe \$4D2,0: wait vbl
The reason that your ST resets when you erase a memory bank is that the music keeps track of the address of the next notes, but when you erase a memory bank all the other banks are moved around to fill up the freed memory. This means that the address the music thinks the next note should be at is just a random piece of memory, and playing these usually crashes your machine.

Slow blitter

On one of your previous Cover Disks you gave away the STE extension. I had assumed that using the BLITTER chip was faster than using normal STOS commands, but I have now discovered that the BLITTER chip is slower than some existing STOS commands! Do I have a slow BLITTER chip or is STOS extremely fast?

Andrew Macmillan, Aberdeen

stf: Neither actually... Even using the BLITTER chip it's still possible to write slow commands.

Using the DMA chip

I am writing a game which uses a

lot of samples. Although the game runs on a normal ST I want to add "enhanced" features for the STE. Can I play back samples using the STE's DMA chip?

Henry Rawlinson, Brighton

stf: Yes, it is actually possible to play back samples on the STE by simply poking a few values into the DAC (Digital to Analog Converter) chip. This listing plays back a 25KHz sample from memory bank 10:

```
10 ADR=start(10) J
    : SIZE=length(10)
20 FREQ=2: rem= 0=6.25, J
    1=12.5, 2=25.0, 3=50.0 <
25 rem= set start address <
30 poke $FF8907, peek(varptr J
    (ADR+3))
40 poke $FF8903, peek(varptr J
    (ADR+1))
50 poke $FF8905, peek(varptr J
    (ADR+2))
55 rem= set length <
60 poke $FF890F, peek(varptr J
    (SIZE+3))
70 poke $FF890F, peek(varptr J
    (SIZE+1))
80 poke $FF8911, peek(varptr J
    (SIZE+2))
90 beat(7, FREQ)
100 poke $F8921, FREQ
```

stf: When you buy a Falcon with an internal hard drive it is supplied preformatted and ready to use. Atari do supply a hard drive utility program but you should have no need to use it.

If you choose to buy an external SCSI hard drive it is also supplied ready to use, but check with the dealer you are buying it from to make sure. Hard drive installation software is always supplied with a brand new external hard drive.

Jagged edge



I have an ST and a Canon BJ-10e printer, but I have never been able to print a picture without "jaggies" appearing on the diagonal lines. What can I do to get better results?

Matthew Hosanee, Kent

stf: The problem with printing pictures from the ST in low resolution is

that each individual pixel displayed on-screen is quite large. When the image is transferred to paper, you are copying an image that is only 320 dots wide across a width of 205mm, making each pixel over half a millimetre in size - leading to the grainy effect you were talking about. Even though the BJ-10e has a printing resolution of 360 dpi, it cannot improve or enhance the original image. To achieve better results you can either

print out smaller pictures or use a high resolution drawing program which has twice the resolution. For this, you are going to need a high resolution monitor or a mono emulator.

Cue playback



I have an STFM and I am getting the Quartet sample sequencer. What is the Playback Stereo

graph paper then you are able to transfer the coordinates straight into your code. It does work.

Users fonts

I was pleased to find the GFA listing in ST FORMAT issue 41 for loading GDOS fonts into GFA Basic, but regret to say after countless attempts and configurations I am still unable to load the fonts, please help! Also, once I am able to load in the fonts I want, how do I display them on the screen?

M Nicholson, Cambridgeshire

stf: When you install GDOS you must also include the fonts in the folder GDOS.SYS on the disk and also include ASSIGN.SYS which informs GDOS which fonts are available for the particular resolution you are working in.

A quick way of doing this is to use the GDOS installation from Hyperpoint, which uses GDOS,

and sets up fonts to be used. Then run the GFA Editor and load the program from issue 41. The program also demonstrates how to display them on the screen using DEFTXT and TEXT or ATXT.

Atari windows?

I am writing an Accessory program for text input using GFA Basic. But having tried XBIOS(21) and CHR\$(27)+"E", I cannot enable the cursor. Could you tell me how to do this?

Albert Halliday, Glasgow

stf: You are correct to use XBIOS(21) and PRINT CHR\$(27)+"E" but the GFA manual states that the VT52 Control codes, which you are accessing, can only be used for screens that do not contain windows. These control codes work perfectly well outside a window. The small listing we have included below shows you exactly how they work outside a window.

```
CLS
PRINT CHR$(27)+"E" : enable cursor
-XBIOS(21,2,15) : set blink rate
FOR F=32 TO 128
    PRINT CHR$(F) : print ASCII character(f)
    PAUSE 20 : Slow down loop
NEXT F
```

If your program needs to run within a window, here are a few options you may wish to consider. Make your own window and confine the cursor and text within this box. On selecting your Accessory, you take a picture of your screen using GET 1,1,639,399,AS, and clear the screen. Once finished with your program replace the original screen with PUT 1,1,AS.

To save memory you can just grab the area where your window or box is and then replace it afterwards. If you still want to use a window, initialise your own cursor and print it in front of the text being displayed.



STOS CORNER

programs then obviously it's a total waste of money.

Alan Hawker, Barry

stf: A quick check with Commodore confirmed that the MPS1270 supports both Epson LQ and IBM ProPrinter emulations, all you need to do is select the Epson LQ printer drivers from within ProText, TimeWorks and First Word Plus and away you go.

TOS switchers



I want to upgrade to a Mega STE from my STFM but I am worried about software compatibility, how much of my software is incompatible? Can I install a TOS switcher into the Mega STE to retain compatibility?

Dan Saunders, Oxted

stf: Some older games are not TOS 2.06 compatible and do not run on the Mega STE. Generally, all serious software such as word processors, DTP and MIDI programs work without any problems. Mega STEs are no longer manufactured, so you may find it quite difficult to get hold of one now. There is no TOS switcher available for the Mega STE.

I want to be a PC



I have heard about the Macintosh and PC emulators being developed for the Falcon, can you install both emulators and be able to switch between them freely?

Will I be able to play PC games?
Matthew Chequer, Wiltshire

stf: The two emulators that are under development both use the internal expansion slot inside the Falcon,

Billy Allan delves into all your STOS problems

It's a mystery

Can I run programs from a compiled STOS program which are not themselves STOS programs?
S Lewis, Weymouth

stf: Unfortunately not. It's one of the great mysteries of our time why this should be, but this is going to be remedied in the forthcoming Super STOS.

Tracking music

Is it possible to play a TCB Tracker tune on interrupt from STOS?
D S Lewis, Sevenoaks

stf: No, you can convert the tune into a normal format module and then play it back with one of the Tracker replays which do work with STOS. The only TCB Tracker routine which we've come across makes your programs pause until the Spacebar is pressed.

Out in the cold

I am writing a program where I want the user to enter a code upon which the computer freezes until the same code is typed in again. Could you show me how to do this?
Craig Duncan, Edinburgh

stf: This program should help:

```
10 input CODE$
20 repeat
30 input CODE2$
40 until CODE2$=CODE$
```

Musically challenged

I am interested in programming in STOS and I was wondering where I could get a copy of the STOS Compiler. Also, are there any music editors for STOS other than the accessory which comes with it?

David Johnstone, Langholm

stf: You should be able to get the Compiler from any software outlet. If not, try looking through the pages of ST for mail order firms. There are several PD outlets whose music can be played back from STOS - Tristar/TriMod and Megatizer are good examples.

Cleaning up your BAKs

I have written a program called DiscClean in STOS which deletes all the .BAK files on a disk, but it doesn't seem to function properly.

Laurence G Withers, Calcut

stf: This listing deletes all of the files matching a given file-mask from all the folders on the current drive;

```
10 key off: ide; _
20 curs off: mode 1
30 dir$=""
40 dim OF$(MAXLEV)
50 input "Enter file mask:"
60 OF$="*.*": MK$=""
70 for T=1 to MAXLEV: _
80 OF$(T)=OF$+next T
90 OF$(LEV)=dir first$("*.","",-1)
100 F$=OF$(LEV): goto 140
110 F$=dir first$("F$","",-1)
120 while F$>OF$(LEV) and _
130 F$<"" : F$=dir next$ : Wend
140 if left$(F$,1)="" then _
150 if val(mid$(F$,2,4))=16 _
then OF$(LEV)=F$ : _
dir$=left$(F$,12) and _
inc LEV : gosub 190 : _
goto 90
160 if F$="" then previous : _
OF$(LEV)=F$ : dec LEV : if _
LEV=0 then goto 110 else end
170 F$=dir next$
180 goto 150
190 on error goto 200 : print _
dir$>MK$ : kill MK$ : _
goto 210
200 resume 210
210 on error goto 230 : return
220 end
230 print err,err1
```

so you cannot install them both at the same time. Playing PC compatible games depends on how fast the PC emulator runs and whether it supports the screen modes required by

the game, the latest news we have about Falcon Speed from Compo is that it only runs in colour when using the popular Microsoft Windows.

Returning backwards

I am writing an address book/diary and word processor. Can you please help me with some queries?

In issue 34 you included a listing on how to recognise the <Backspace> key. When using this I cannot get the <Return> key to work. How can I make the text carry on to the next line when I hit the far right of the screen? Also when using the listing, when I backspace to the point the cursor started at, a message comes up saying "String too large." How do I overcome this?
Aaron Gibbs, Devon

stf: The annotated listing below should help with your queries. The "String too large" message is because when you are deleting a character you are not deleting your pointer to overwrite the deleted letter, so the pointer would have been pointing at the next letter and eventually you would reach the end of your string length.

```
counter=1 line counter
DO
a1=INP(2) wait for keypress
IF a1=8 backspace
```

```
PRINT CHR$(8); " ";CHR$(8); delete chr$
SUB counter,1 decrease counter
IF counter<=1 counter=1
ENDIF
ENDIF
IF a1=13 return key new line
PRINT !
ENDIF
IF a1>=32 print legal chr$ PRINT CHR$(a1);
ADD counter,1 increase counter
ENDIF
IF counter>=80 check end of line
counter=1 reset counter
PRINT ! new line
ENDIF
LOOP (put your exit condition here)
DO
```

Out of sorts

How can I sort some addresses into alphabetical order and save them?
William R Mogg, Gloucestershire

stf: The annotated listing below should help you sort your array(s) into alphabetical order. Bear in mind that if you are using a DIMmed statement for more than one dimension, that is DIM a\$(100,7), more programming is required, and temp\$ has to be DIMmed as temp\$(1,7) and you have to program the swap for all seven fields.

```
DIM a$(5)
FOR f=1 TO 5
Get names
PRINT "name no. _"
PRINT "f:" f
INPUT a$(f)
NEXT f
CLS
PRINT "Unsorted array"
FOR f=1 TO 5
Print names
PRINT a$(f)
NEXT f
PRINT
PRINT
pointer=1
recursive sort routine
```

```
IF a$(pointer)=a$(pointer+1) _
temp=a$(pointer)
place a$(pointer)
in temp storage
a$(pointer)=a$(pointer+1) _
swap a$+1 into a$
a$(pointer+1)=temp$
place temp$ into a$+1
ENDIF
ADD pointer,1
increase pointer
LOOP UNTIL pointer=a$+1
loop until pointer =a$+1
SUB a,1
*** see text
pointer=1
reset pointer
LOOP UNTIL a=1
end recursive sort
PRINT "Sorted array"
FOR f=1 TO 5
print sorted array
PRINT a$(f)
NEXT f
```

*** We are reducing a1 by one as after the initial pass we know that at position a\$(5) is held the string with the highest ASCII value and we have no need to compare it again with the other strings; hence the name recursive sort.



STOS STUFF

stf: The Atari SC1435 monitor works with all STs – and that includes the Mega STE.

Compression problems

My Brother H1001 printer combined with Write On gives strange results – when I print pictures that I have created with Hyperpoint, they come out compressed horizontally, why is this?
Ken Norman, London

stf: You are having problems because you are creating your pictures in medium resolution, while Write On treats all IMG files as if they have been created in high resolution. Use a mono emulator like Sebba – from Cover Disk 40 – to create your graphics and import them into Write On.

Double switching

Is there a switcher or cable which could enable me to connect a Gravis Mousestick to both joystick ports at the same time? This would save wear and tear on the joystick ports.
John D Chamberlin, London

stf: There is no such device available, but why not get a normal joystick and mouseport extension cable? They only cost around £5 and you can get them from most good computer stores like Tandy.

Dead mouse

I have a problem with my ST mouse. Sometimes the buttons don't work and the mouse pointer stops completely. There is nothing wrong with the ports because I tried a friend's mouse and it works fine.
Graham Smea, Dublin

stf: The problem here lies with the mouse cable itself, the conductors break after repeated movement. The answer is to throw it away and get a new mouse, many companies supply replacement mice and Gasteiner Technologies (☎ 081 365 1151) can provide original Atari mice for £8.

SCSI too

I own a Falcon and have been unable to find a SCSI1 to SCSI2 lead to connect my Apple hard drive with 50-way Centronic D connector, where can I get this lead?
Peter Bradley, Stockport

stf: Meadmore have SCSI1 to SCSI2 leads in stock, part no K4216. The price is around the £25 mark, call

Are you stuck, stalling, or just getting stale? Billy Allan stands around and studiously starts answering your sticky STOS stinkers. PheW!

An author writes

In the June issue of ST FORMAT you stated that the text viewer and intro screen of the Slug 2092 game were written in assembly. This, however, is not the case. The intro screen uses a remapped P13 picture which is then XORed onto the screen.

The text viewer then works out the text onto the screens and copies them up and down the screen. I would appreciate it if you could set the record straight. The full source code for the game is available for a £5 fee.

Mark Terry, Romsey

stf: The part of the intro screen we were referring to when we said it was written in assembly was in fact the scrolling raster, not the rest of the program. I hope that anyone who wants to see exactly how you did it will take up your offer and buy the source code from you.

You can't come in

I have written an address program, but I want to have a password system where the program

resets if the password is not entered within a certain time. Can you help?

D Erglis, Brynna

stf: This fitting ought to help. It waits until either the correct password is entered or the time limit expires or they get the password wrong. The STOS time resets your ST if you re-enable it.

```
20 PWS="Password" : CL=1
25 timer=0
30 print "Enter password:"
40 G0=iskay0 : if G0="" J
   then goto 70
50 if G0<>PWS[CL,1] J
   then print : print
   "Incorrect!" : wait J
   key : goto 80
60 inc CL
65 print G0
66 if CL=Len(PWS) then J
   print : print J
   "Correct!" : end
70 if timer<10*50 J
   then goto 40
80 emulake$70,Leak(84)
```

Compiler query

I have written several small programs which I have saved as standalone programs. The thing is, I need to copy the whole STOS folder around, which takes up a large amount of disk space. Does

the Compiler generate one file for its programs? Also, do I need to send a copy of my programs to every PO library to get them distributed?

David Sykes, Halifax

stf: The Compiler turns your BASIC file into one program file. These can then be packed with packers such as Ice or SpeedPacker and quite often end up at around 30K to 40K long. If you want to release your programs to PD, then it's as well to send them to as many libraries as you can, but if your program proves popular it's bound to make its way around without your help.

Falcon STOS news

It now seems very likely that a version of AMOS professional (the Amiga version of STOS) will be coming out for the Falcon. Europress say they are not handling it, but it is rumoured that Jaxx (the original programmers of STOS) are producing it on their own. STOS itself works alright on the Falcon, provided you have the patch programs which have appeared on previous Cover Disks. The key repeat speed goes a bit haywire and another couple of very minor bugs appear. It runs under MultiTOS, but does not exit properly. This also goes for compiled STOS programs.

Meadmore for current prices and more information on ☎ 051 521 2202.

Sticky solution

In ST FORMAT 46 it was suggested that isopropyl alcohol could be used to remove disk labels, a rather messy procedure. An easier method is to leave the disk on top of the ST just above the power supply for about 10 minutes, the glue softens and the label simply peels away.

G Longley, Manchester

stf: Thanks for that useful tip, G.

Ker-aashh!

I have a problem with the video chip of my ST (I think), when it gets hot it crashes and the screen gets corrupted. I have taken it to be fixed locally but nothing seemed to have changed.

Geoffrey Harrison, Stalybridge

stf: You should send your machine to a repair centre that specialises in STs like Analogic Computers (☎ 081

546 9575). There is a standard charge of £60 and they also arrange courier collection and delivery.

Llamatron blues

I am having a problem with the 1MByte version of Llamatron when running from my Gasteiner M*** drive. The game crashes after I reach Level Seven, yet the 512K version works fine. The 1MByte version also crashes when I run it from floppy with the hard drive running. Llamasoft were unable to give me any advice. Any ideas? I have a 1040 STFM running TOS 1.2.

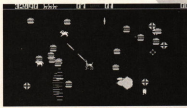
Colon Watson, Dundee

stf: Your problem comes from TOS 1.2 as it causes trouble when used with a hard drive. Upgrade to TOS 1.4 or install a TOS switcher from Compo Software (☎ 0480 891819), their STFM model costs £59.99.

Size matters

I find that the editing software supplied with my scanner is too limited, I need to be able to edit and adjust the size of a printed image. What do you suggest?
George Merriman, Nottingham

stf: The ideal program for you is called MultiPrint, from the ST Club. It



That laser-spitting llama's back for some more burger-bashing mayhem – just make sure your ST's running TOS 1.4 (or higher).

Cover Disk problem

 I use my Falcon for music with Notator Logic. My problem is with the Cover Disk, only *Prism* Paint and the sequencer work. Is this a problem with my machine or is it the Cover Disk software itself?

Fryderyk Babinski, Poland

stf: Because of the radical differences in the new version of *TOS* for the Falcon, many *ST* programs do not run, particularly *PD* or *Shareware* software, and the software on our *Cover Disk* is designed for use on the *ST*. You can see that we're now indicating whether *Cover Disk* software is Falcon compatible in the *Disk pages*.

Cache and carry

 If you wish to disable the Falcon cache then you have to edit the *NEWDESK.INF* file in a text editor and change some of the settings as described below. You can also enable overscan mode to give your Falcon a larger screen area.

TOS 4.00
Change the line:
#E P8 03 00 06 01 2A 00 00 00.1
to
#E P8 05 00 06 01 2A 00 00 00.1
to enable overscan mode

or

#E P8 03 00 04 01 2A 00 00 00.1
to disable the cache

TOS 4.01
Change the line:
#E P8 03 00 06
to

#E P8 07 00 06
to enable overscan mode

or
#E P8 03 00 04
to disable the cache

TOS 4.02
Change the following line:
#E 18 02 00 06 00 2B 00 00 00.1
to
#E 18 05 00 06 00 2B 00 00 00.1
to enable overscan mode

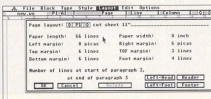
or
#E 18 02 00 04 00 2B 00 00 00.1
if you want to disable the cache
Peter Jousra, Holland

stf: Thanks for that, Peter.

Length problems

 I have been having a few problems with setting the page length in *Write*. On *Am* I am unable to set the page length in lines, only in inches. Do you know if there is any way to set the page length in lines since that's a bit more convenient?

Glynn Brow, Hants



It's easy when you know how (and have a manual handy). Clicking on the bits and bobs of the page layout dialog box enables everything to be configured down to the last pic.

ture you correct notes to the nearest selected measure. Now when you enter score edit, things should look rather more clear.

You may be able to enhance the display further without affecting the music by using a display quantise feature. This simplifies the music score further still and makes it easier to read. If you fiddle around with all these procedures you should be able to get the results you want.

Quadraphonic ST

I have been using a *Soundtracker* program on my *ST* for over six months and it seems as if it's got four sound channels. If this is so, why are there only two outputs on the back of my *ST* for sound?

Shouldn't there be four to cover each sound channel? At present, it



STOS CORNER

Got a hassle with STOS? Then send in your probs to Billy Allan who can sort them out for you, no hassle

Printer printing

Is there a way to print a document from disk to the printer from *STOS*, without using the *TRAP* command? Graham Third, Kilbirnie

stf: The easiest way is to use the *OPEN* command to open a channel to the printer port, then just *PRINT* the text to that channel. This listing shows how to do it.

```
10 P8=file select$(**,"load.1
a doc to print",4)
20 if P8="" then default: end
```

stf: Many of the features of *Write* On are not obvious when you look at the screen; you can, in fact, set the paper length by the number of lines from the *Page Layout* option of the *Layout* menu.

You can customise individual lengths in the *dialog box* by clicking on them once, the cursor then moves to the relevant figure and you can then edit it.

What isn't so obvious is that you can also edit the method of measurement. If you click on the word "inch" in the line "Paper length: 11 inch" it changes so that it reads "lines," click there again and you can see it changes from "lines" to "cm." All of the measurements can be customised and then stored by using the *Save Layout* option.

```
30 open in #1,P8:1
open #2,"prt"
40 repeat
50 line input #1,A8:1
print #2,A8
60 until eof(#1)
70 close #2: close #1
80 goto 10
```

Follow the leader

I have seen some demos which feature screens where a line of sprites appears to follow the sprite at the head of the line.

Can you tell me if there is a quick way to do this from *STOS* because I want to include this effect in a game I'm writing? James Scott, Hastings

Old Atari

 I have switched to the *STE* from the *PC* and I am keen to find out where the *PC-style ST*, pictured in issue 48, came from. Although I like the *ST* I do miss the separate keyboard and base unit style of the *PC*. Geoff Eklund, Notts

stf: The *ST* featured in the picture is the *Mega ST*, which is no longer manufactured. Atari later released a newer two part machine which is called the *Mega STE*, also no longer available, but you may be able to get a discounted machine if you shop around.

The other alternative is to re-house your *ST* in a new case. The company to contact is *System Solutions*, they supply tower cases for all the different *STs* enabling all sorts of add-ons like hard drives, extra floppy drives and tape streamers to be mounted in the main case with a separate keyboard. The *Lighthouse Tower*

is possible to do the above? If not, are there any sequencing packages that can do this for me? Martin Warhurst, Cleckheaton

stf: The best way to do the transfer is to use a sequencer which can accept incoming MIDI on more than one channel and store it accordingly. This is called "Multi Channel" recording. The cheapest package to do this is probably *Breakthru* (available via *STF Mail Order* see page 98).

There is a way which you might try with *Sequencer One* but it is a great deal more fiddly. Put *Sequencer One* into *External Sync* mode and then hit *Record*. Select the correct track and channel to record on and play your piece with every part muted except the first. Repeat this process until all parts are transferred and you can then save the result as a MIDI file.



MUSIC AND MIDI

Need something sorting with the world of sounds? Andy Curtis is your man

One foot in the stove

I have used different sequencer programs on my *STE* with a score edit feature. When I try to use this feature there is an awful mess of notes on it which doesn't resemble my music at all. Can you please suggest how I can get the score editor to list my music properly instead of just giving me all this trash?

Chuck Murphy, USA

stf: It is important that, before score edit is used, you hard quantise the music to be edited. This is because your performance can never be completely perfect! The "mess of notes" you are seeing is actually exactly what you played into the sequencer. By using the quantise fea-

seems as if two channels are coming out of each output. Malcolm Herrington, Guildford

stf: A standard stereo hi-fi system has only two channels, the left channel and the right channel, as does your *STE*. No matter how many channels are represented on-screen via your software there are still only two actual sound output channels. Even in a large recording studio where there are dozens of channels, each one is always mixed into a two channel stereo output. Your *STE* is no different in this respect.

Natural progression

I use a Korg SQD1 hardware sequencer. My problem is that I want to save my songs as MIDI files. I have access to a 1040STE and have tried to send information from the SQD1 into *Sequencer One*, but it doesn't work. Is

stf: The simplest method, as used in this listing, is to copy the old X and Ys down through an array, replacing the first X and Y with the new position of the head sprite.

Then you just display one sprite for every three or more X and Y co-ordinates and they look as if they're smoothly following the head sprite.

```
10 key off : hld : curs off : j
mode 0 : update off
15 loks $45A,hum (start(1) j
to
start(1)+length(1),j
"FAIR":+4 : wait vbl
20 dim X(9),Y(9)
30 for T=0 to 9 step 3
40 sprite T+1,X(T),Y(T),1
50 next T
60 for T=9 to 1 step -1
```

```
70 X(T)=X(T-1) : Y(T)=Y(T-1)
80 next T
90 X(0)=x mouse : Y(0)=y mouse
100 update : wait vbl
110 if inkey$="" then goto 30
120 default : end
```

Explosive question

Could you tell me how to make an explosion like a firework in STOS? I want to have a big explosion of dots when a ship is blown up in a game.

Patrick Harvie, Manchester

stf: The actual routine is fairly easy to write, but you may find that it is too time-consuming to include in the main loop of your game, especially if you are

going to have one of these explosions when every ship is blown up.

```
10 key off : curs off : hld : j
mode 0
20 palette $0,$777
30 dim X(22),Y(22),SX(22),j
SY(22)
40 dim OX(22),OY(22)
50 logic-back
60 X=rdm(300)+10 : j
Y=rdm(100)+50
70 for T=0 to 22
80 X(T)=X : Y(T)=Y
90 SX(T)=rdm(12)-6 : j
SY(T)=rdm(14)-10
100 next T
110 repeat
120 for T=0 to 22
130 if OY(T)<200 then plot,j
```

```
OX(T),OY(T),0
140 next T
150 FLAG=true
160 for T=0 to 22
170 X=X(T) : Y=Y(T)
180 OX(T)=X : OY(T)=Y
190 X=X+SX(T) : if X>319 j
then X=0
200 if X<0 then X=319
210 if SY(T)<12 then inc SY(T)
220 Y=Y+SY(T) : if Y>199 j
then Y=200
230 if Y<200 then plot X,Y,1 j
FLAG=false
240 X(T)=X : Y(T)=Y
250 next T
260 screen swap : wait vbl
270 until FLAG
280 if inkey$="" then goto 60
290 default : end
```

costs £219.90 including the keyboard kit and is relatively simple to assemble, contact System Solutions on ☎ 0753 832212 for their latest prices and details.

Slow mouse



I have a problem with my mouse when I move it vertically – and no – it's not the Ghost Virus! The problem is that the pointer movement on-screen occasionally slows down to a crawl no matter how fast I move the mouse, and sometimes the mouse only moves in one direction. I have checked for viruses and my floppies are clear although my mouse is rather old.

Marcus Lund, West Yorks

stf: It would seem to be a hardware problem rather than a virus, and it could be one of several things causing the symptoms. If you have a joystick

connected, make sure the auto-fire is switched off. This can cause mouse and keyboard related problems.

If it's not the joystick then it could be the mouse lead. The conductors in the cable tend to break where it enters the mouse body, leading to intermittent faults. Also, give your mouse ball a good clean along with the rollers inside the mouse, muck can build up here leading to erratic and sluggish movements. It could be the actual mouse socket itself, borrow a friend's mouse to see if it has the same problem on your machine. If it does prove to be the socket then the connections need to be re-soldered, a local computer repair shop can do this, or if there isn't one handy contact Ladbroke Computing International ☎ 0772 203166, they have an excellent repair service.

New mice can be found almost anywhere costing between £10 – £15 for a sturdy model, try the Truemouse from Evesham Micros ☎ 0386

765500, it's a 300dpi mouse and costs £14.99.

Information wanted



I am a programmer and I am thinking of writing programs in assembler for the Falcon. The problem is that I need information about the various new hardware bits and pieces in the machine. I know from experience that Atari do not exactly drown their customers with documentation, do you know where I can get the kind of information I need?

Matthew Tomlinson, Kent

stf: You can get official developer's documentation from Atari for the Falcon, they have a package called DevSupport 6 which is Falcon specific. It contains information on MultiTOS, the clipboard protocols, the internal expansion port, the video port, the DSP, the audio subsystem and the parallel and serial ports. All new XBIOS calls are listed, a DSP assembler and linker guide is provided along with a disk containing a DSP Debugger and DSP Toolkit program. The kit costs £49.95 direct from Atari Technical Support, Atari House, Railway Terrace, Slough SL2 5BZ. Another useful source of information is the new book that HiSoft are including with all the Falcon versions of their programming languages, including Devpac 3. The book is 256 pages long and covers all aspects of programming for the

Falcon, including MultiTOS, SpeedoG-DOS and the DSP chip. The book can also be purchased separately for £24.95, call HiSoft ☎ 0525 718181.

Superbooting with XControl



Superboot and XControl are both excellent utilities, it's a shame that you can't use Superboot to select which CPXs to load. There is a way around this.

1. Place all the CPX files in a folder called Control.
2. Select the CPX path from within the XControl panel to the Control folder and save the settings, this creates a file called CONTROL.INF.
3. Edit the CONTROL.INF file in a word processor, modifying it to the search path reads A:\CONTROL*.CPX instead of A:\CONTROL*.CPZ.
4. Now save the modified file in ASCII format.
5. Run the Superboot Construction Set and configure "Other" file types. Enter .CPX files as type 1 and set the directory to A:\CONTROL*.CPX. Now save the Superboot settings.
6. When you reboot you can select the CPXs you wish to load from the "Other" file menu and XControl loads them as normal.

Ben Irwin, Sheffield

stf: Brilliant – what a useful thing to be able to do – that'll make lots of people's lives so much easier.

MIDI and STOS

Best value sequencer

I am a beginner to ST computing and I own a 1040 STE. Which is the best medium priced music software for my STE, and would it work a lot better if I upgraded my RAM? I read your Breakthru review and was very impressed by its potential, but I would like a recommendation on different sorts of software within the price range £100-£200.

David Watkins, Dyfed

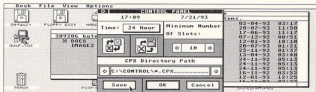
stf: If you are looking for something to control sound samples, as well as MIDI instruments, then Breakthru is quite unique in its price range. It's a fine MIDI sequencer with many advanced features and yet it retains an unequalled level of control over sound samples. Check out our special offers on page 98 if you're interested in getting

hold of the package. If you are prepared to forego the sample features then the scope widens somewhat. You could try Cubase Lite by Steinberg (£99 from Harmon Audio ☎ 0753 758911). This is a cut down version of Cubase and features the superb Cubase arrangement window.

For incredible cheapness and good value have a look at Concerto (£39.95 from Microdeal ☎ 0525 713671). This is a great beginner's package which even has score and drum edit features.

If you are going to run Breakthru then the more free RAM you've got the better; 2MBytes of RAM should leave you an abundance of room for all the samples you're ever likely to use. The RAM supplied in your 1040STE should also be quite sufficient to enable you to run the other programs.

Hope that's given you some idea of what's available!



It's very simple indeed! All you need is the XControl Panel, Superboot, a word processor and some ordinary household bleach and you can soon cleanly load those pesky CPX modules like nobody's business.

ST ANSWERS

Connecting CD-ROMs, curing viruses, PC compatibility and many other questions are expertly fielded by the ST Answers crew

THE ST ADDRESS

Send all your ST-related problems to ST Answers, ST FORMAT 30 Monmouth Street, Bath BA1 2BW. Please indicate the type of problem on the envelope.

BEGINNERS

If you have bought your ST recently and you're not quite sure about which bit goes where, you need help.

COMMS

Communication is the buzz word for the '90s and is becoming a buzz word for ST Answers. Check it out here.

DISKS

Floppy disks spin at incredibly high speeds, so something's bound to go wrong with them at some stage.

GAMES

If, chatting at games is your thing, but you're better off at Gamebusters.

GRAPHICS

Having a few problems with your graphics package? And yours are not quite sure where to turn to. Well, look no further.

HARD DRIVES

It's hard, very hard and can store a hell of a lot of data. Sometimes though, it causes unsolicited errors.

PRINTERS

Using a printer is the easiest thing in the world... until your paper gets chewed and big black blobs start appearing.

PROGRAMMING

Whatever language you use, at ST FORMAT we have the experts to tackle your particular programming nightmare.

SOUND

You're lost in music, no tuning fork... and all that Sietter Sledge stuff. Look for this logo if you're into sounds.

ST PROBLEMS

If you're not quite sure what your looking for, or not quite sure what your problem is, look out for this logo.

Co-processing

I am considering adding a 68881 co-processor to my Mega STE and have a few questions to ask. Would all software benefit from it or would the program have to be specially written? Does the co-processor speed up the screen updates in Calamus? Where can I buy the 68881 co-processor that was mentioned in the news article in ST FORMAT 50?

Philip Hough, Newport

stf: Co-processors are only used by specially written software, if a program doesn't know that the 68881 is in your Mega STE then it can't use it. Unfortunately Calamus falls into this category, it has no co-processor option. The 68881 costs £52.88 and

! Sadly, the Chaos Engine demo didn't work on some older STMs. It's still a brilliant game though, so go and get it.

the 68882 costs £76.38, from CGS ComputerBild on 081 679 7307.

Chaos chaos

Is my Cover Disk faulty? I have tried to decompress the Chaos Engine demo from issue 49 and it doesn't work. The demo resets my ST in a few seconds when I run it. I have a 1MByte STFM.

L D Sanderson, Peterborough

stf: No, your Cover Disk is fine. Unfortunately our Chaos Engine demo

doesn't work on some older 1040 STMs and upgraded 520 STMs. The full version of the game works perfectly on all 1MByte STs including STFMs, so you can buy it.

Keyboard killer

I have a problem with a virus inside my STE. I can only use the first five keys on each line of the keyboard, the other keys either don't work or display random ASCII characters. I have tried various virus killers but they don't work. They deal with infected disks and not my



STOS CORNER

Stuck on your STOS? Billy Allan provides the solutions

Sound techniques

Could you please tell me how to get ST Speech to work within STOS and whether you can play Quartet music from within STOS? How do I run animations from STOS? I own Animaster and Cyberpoint.

Maximilian Worth, Bognor Regis

stf: There is a PD disk which shows you exactly how to use ST Speech, it includes a special version of ST Speech for STOS. You can get it from Floppypop (0224 586208) on disk LAN 75. There is PD program by ZDD which enables you to play Quartet music, also available from Floppypop on disk number MUS 3687. We don't think there is a program which displays SEQ files from STOS, though if anyone has one then please let us know!

Interzone inc

I have recently come across an unusual bug in STOS. When you use the cBAR command in an .ACB file and you try and call it for the second time, a row of black holes appears down the left side of the window and the message "Editing Program 5" comes up on the screen.

If you then press HELP again you can now list the accessory even

though this is usually impossible! Do you have any suggestions?

A M Marsh, Kent

stf: Well, you certainly get the prize for "Most Obscure Bug of the Month"!

Unlimited edition

How do I make one of those "infinite" sprite screens. I'm sure there is a bit of cheating going on!

Lawrence Bredt, Inverclyde

stf: "A bit of cheating" is an understatement! The way they work is to draw the sprites without restoring what was underneath them before they were drawn, as normal. If you then keep flicking through a series of different screens in a loop it appears as all of the trails left behind by the sprites are in fact moving! This how to do it.

```
10 key off : hide : curs :
    off : mode 0
20 bob 0,0,320,200,0,1
30 reserve as work 10,32000*4
40 bin SCR(5)
50 Deplot(start(1)) : wait vbl
70 fill start(10) :
    to start(10)+length(10),0
80 XB=25,0 : YB=30,0
90 SCR(0)=back :
    SCR(1)=physic :
    SCR(2)=start(10)
91 SCR(3)=press HELP :
    SCR(4)=start(10)+32000 :
    SCR(4)=start(10)+64000
```



! The sprite is not erased when it is moved, giving the impression of multiple images on-screen.

```
92 SCR(S)=start(10)+96000
100 CNT=0 : G1=15 : MKR=0 :
    G1B=rad(G1)
110 rem MAIN LOOP :
120 logic=SCR(CNT) :
    inc CNT : if CNT>5 :
        then CNT=0
130 X=(XB*sin(G1B))+
    +YB*cos(G1B))+150,0 :
    Y=(YB*cos(G1B))+
    +YB*sin(G1B))+80
140 inc G1 : if G1>359 :
    then G1=0
160 inc MKR : if MKR>359 :
    then MKR=0
170 G1B=rad(G1)
175 XB=XB*sin(rad(G1*2))*2
176 YB=YB*sin(rad(MKR*3))
180 bob logic,start(1),0,X,Y,0
190 physic=logic : wait vbl
200 if inkey<"> then :
    goto 120
210 default : end
```




■ **Wordflair in action loading an IMG file.** Wordflair is another amazing Cover Disk give-away on **ST FORMAT 52**, turn to page 47 to order a copy if you missed it. How do we do it?

in Image file format (IMG) or Degas high resolution format (PI3). Protext can only read text files, it is not capable of loading graphics. If you want to be able to read your scans you have to use a graphics program or use a DTP or document processor that can import IMG or Degas PI3 files. Try Wordflair from Cover Disk 52, it can read IMG files directly and has a utility program to convert PI3 pictures to IMG files. You can get a copy of GDOS from the ST Club for £4.25, call them on 0602 410241.

Writeable CD-ROM?



I am considering adding a hard drive to my ST setup and I am interested in getting the Link and a non-Atari hard drive. What should I look for when buying a hard drive to use with the Link? Would I be better off getting a CD-ROM drive? I have seen them advertised for £269.99, if I add that to the cost of the Link it adds up to a reasonable price.

I understand how a hard drive is partitioned and formatted, but how do you go about formatting a CD-ROM disk and how much is a blank CD?

W M Black, Brighton

stf: Er, you are suffering from a misunderstanding about CD-ROM drives and how they work. A CD-ROM disc is already full of data when you buy it, up to 650MBytes of information can be stored on a disc depending on the type of data. You can't buy blank CD-ROM discs. The reason it's called a CD-ROM is because you can only read data from a disc, you can't save information to it. ROM stands for Read Only Memory, exactly the same as the ROM chips in your ST which store the TOS operating system.

If you want to buy an ICD Link and add a "foreign" hard drive to it you must make sure that you buy a SCSI hard drive, this is the only type of drive that works with the Link. External SCSI drives are available for Apple, PC and NeXT computers, so you may like to shop around for a



STOS CORNER

Billy Allan sorts out some of the mysteries that surround the world of STOS

A bit of escapism

Is there any way of recognising the <Esc> key from within a STOS Basic program?

lrzhad Azmutally, Luton

stf: Yes, try REPEAT : GS=INKEY\$: S=SCANCODE : UNTIL S=1.

Synchronicity

I have heard that it is possible to do hardware scrolling on an STFM. Is this true, and if so am I able to do it from STOS?

Robert Engles, Swansea

stf: Yes, it is possible, it's normally called "cheap" hardware scrolling. This is achieved by adding and subtracting 1280 bytes from the screen address which moves the screen up or down by eight pixels, using this command.

PHYSIC=PHYSIC-1280

In a ste-w

I am trying to write an art package in STOS and I wish to make use of the STE's extended colour palette. Unfortunately, whenever I save the picture or use GET PALETTE the palette is lost. Is there any way around this?

Alan Mandle, Glenrothes

stf: The only way around this is to store your palette in an array. Whenever you want to save the picture you have to copy the contents of the array to the palette area of your screen bank (the screen's address plus 32000 bytes). If you want to set the palette you could then do something like

LOK \$45A, START(X)+32000

where X is the screen bank.

bargain. Several companies sell the Link with SCSI drives, try System Solutions (0753 832212), they sell a 42MByte SCSI drive with the Link for £359, an 85MByte drive for £379, a 120MByte drive for £399 and a 170MByte drive for £429.

More POV problems



I have successfully rendered the Pacman picture using POV from Cover Disk 49. I then tried to render the Palace picture but the program crashed on line 61. I haven't tried again because the pictures take so long to render. I used exactly the same formula for the Palace picture as I did for the Pacman picture;

tgatrace 320 200 palace
palace.tga

Handy hint

If you are going to be copying the values from one array to another, to store the old co-ordinates for you sprites for instance, you can use the COPY command to move the whole lot at once rather than a FOR...NEXT loop to copy each value individually. For example, the two routines below achieve the same thing, but the second is over 80 times faster!

```
10 rem> The slow method <
20 dim X1(9999),X2(9999)
30 for T=0 to 9999
40 X2(T)=X1(T)
50 next T
```

```
10 rem> The fast method <
20 dim X1(9999),X2(9999)
25 V1=varptr(X1(0)) : V2=varptr(X2(0))
V11=varptr(X1(9999))+4 : V22=varptr(X2(9999))
30 copy V1,V11 to V2
```

Palettical correctness

After drawing a map with the MAP.ACB program, I cannot seem to get the palette. I have tried the normal H=HUNT(START(1)...) but it did not work. Please help.

Andrew Tucker, Milton Keynes

stf: Have you actually loaded the sprite bank into bank one before getting the palette? This is the only thing we can think of which would cause this error. Try entering

```
"load "sprites. msk",1
1:loke $45A, hunt(start(1) to start(1)+length(1),"PALT")"
```

and that should work for you.

Assembly pointers

Each time I try to call an assembly program from STOS I get an address error. I am calling it like this;

```
reserve as work 7,10000
```

```
load "FILE_NAME.PRG",7
call 7
```

Tim Lloyd, Birkenhead

stf: The correct way to load assembly programs into STOS is to load them directly into a memory bank without reserving it first - load "FILE_NAME.PRG",7. STOS automatically reserves a bank as PROGRAM and loads it in. CALL should then work as normal.

Super STOS

I recently sent off for the STOS accessory disk. All I got back was an envelope saying "Gone Away." Can you please give me the address of a company which stocks this disk? Also, could you tell me if it's possible to erase a memory bank from within a running program and whether I can have more than 12 screens stored in memory? I have read that a Super STOS is being developed for the Falcon. Can STOS games run on it?

Keith Preston, Dunboyne

stf: We are unaware of anyone who would supply you with just the accessory disk. Europress are no longer supporting STOS and refuse to give the rights to anyone else so we can only suggest that you try to get hold of a second-hand copy. If anyone's got a copy, send it to us and we can pass it on.

Erase memory banks from within programs by using the ERASE command as you would in the editor. You can have as many screens stored as you like assuming you have enough memory. 12 screens take up about 384K - more than you are left with on a normal 512K ST.

Details of FALCOS are very sketchy. The details we have is that a French company called Brainstorm are writing it and that it may be bundled with the Falcon. It seems that it is to be a Falcon version of AMOS Professional, which means that it should be possible, with some work, to convert old STOS listings to the new style.



■ If you don't have too many spare disks to store your POV pictures on, try rendering them at a smaller size. Instead of entering 320 200 as the picture size, enter 160 100. This results in a Targa file a quarter of the size, this rendering of the Palace POV file only takes up about 50K.

Is this correct?

Ian Smitherman, Suffolk

stf: You are doing everything correctly. We have managed to duplicate your problem on one of our office STs. Your problem is caused by your floppy disk running out of room to store the picture as it is created and saved one line at a time. By running on a floppy based system then there is only enough room for a single 24-bit Targa image on the disk with the POV software, because the image size is

just under 200K. Every time you create a new picture, copy it to a blank floppy disk and then delete it from your working disk. You can fit three Targa images on a 720K floppy disk.

In control



Can you tell me where I can get a copy of XCONTROL.ACC, I have accidentally deleted my working copy and I no longer have Cover Disk 25. I am also interested

STOS CORNER

Is STOS troubling you? Then take Billy Allan's expert advice

A taxing problem

Do I have to be a certain age before I can release Shareware software, and what forms of tax do you have to register for?

Matthew Cottler, Merseyside

stf: No, you can release Shareware programs at any age. Unless you make Minter-esque amounts of money from your Shareware you won't have to worry about tax.

Track me down

Is there any way to read the joystick/mouse while using the STOS Tracker routine?

Matthew Heard, Bristol

stf: It's tricky, although a little unreliable. TRACK KEY returns a value when the joystick is pressed, each direction and fire having a different value. To test for these you have to use the STOS command in much the same way as you

would for JOY. Unfortunately, certain keypresses conflict with the joystick and change the values, but you should be able to work around these.

Size of a Harrier!

Are there any routines or extensions for STOS which enable you to do sprite-scaling like in Space Harrier, or do I have to write my own routine?

Mike Okuda, Lancs

stf: There are rumours of an extension which does this, but we haven't seen it yet. Anyone with information on it is welcome to write in...

Fade to grey

Can I get the original palette back after doing a FADE?

John Colston, Somerset

stf: Yes, as long as the original palette is stored before you call FADE. For instance, if you load a picture into a bank, copy it to the screen then FADE, you can get the original palette back by doing either GET PALETTE(x) or FADE TO x, where x is the bank number.

Extend yourself

Where can I get hold of the Maestro and Compiler extensions?

Dave Redpath, Cornwall

stf: You can still get hold of Maestro from mail order companies (look through the adverts in ST). The Compiler is rather more difficult. Europress have stopped selling it, and refuse to allow anyone else to buy the licence. Most mail order companies seem to have run out, but you may still find one or two who have a copy.

Hishing shamplesh

When I use the routines supplied with Mastersound 2 to play back a sample in STOS they sound hissy and there is a lot of background noise, but they sound OK in Mastersound. What can I do to make them sound better?

P Wellington, Longney

stf: It sounds like your samples are "signed" the wrong way for the replay routines you have. To convert between signed and unsigned formats in Mastersound you can press <Control> <S> or <Control> <N> depending on which ver-

sion of the program you have. Or you could use the SAMSTOS command from The Missing Link extension which was on ST FORMAT Cover Disk 51.

Lonely hearts

Is there any way I can get in touch with STOS users? It's difficult to learn to program without help.

Richard Roth, Paisley

stf: There is a PD disk magazine called Stosser which is available from Goodman International PDL (# 0782 335650). It features a Contacts section.

Wrong division

I am writing a calculator program but the division function doesn't work properly. For example, 19122/5/4 returns 1 instead of 1.25.

B Levin, Manchester

stf: If you want to use get an exact answer you have to include the decimal point in your original values. So your example would become PRINT 5.0/4.0, which returns the correct answer.

same problems, and the people I bought the program from say I may have copied it and refuse to refund my money. The Pagestream manual says that the program works on a 1MByte ST with two disk drives - which is what I have - but I cannot get it to work.

Kristofer Meadoway, Surrey

A This sounds like a software clash of some kind - there is no reason why Pagestream 2.2 shouldn't run perfectly on your setup. Disable all Auto folder programs and Desk Accessories on your boot disk and then run Pagestream; it should load and run without any problems. Now enable each Accessory and Auto

folder program one by one until Pagestream fails so you can isolate the program causing the problem.

Naksha go away

My Naksha mouse is broken, the connecting cable is damaged and the pointer zooms up to the top left corner of the screen - and stays there. I have written to Naksha but the letter was returned marked "gone away." Do you know can I fix my mouse?

Howard G Angel, Harrogate

A Naksha have indeed "gone away;" they are no longer

trading in the UK. There are two answers to your faulty mouse cable problem. You can buy a new mouse practically anywhere for around £10 or alternatively, you can perform surgery on your mouse.

Conductors in mouse cables tend to break where the cable enters the mouse body. If you are handy with a soldering iron you can dismantle the mouse, disconnect the cable, shorten the lead and reconnect the cable to the original connections. On balance it's better to get a new mouse, First Computer Centre (# 0532 319444) sell the Golden Image Mega Mouse for £12.99.

Video killed the radio star

D I have a 2MByte STE and an AOR AR3000A scanner radio. Where can I get software to run the radio using my ST? I know you can get PC radio software but I don't want to buy a PC emulator.

Mike Powell, London W3

A Most PD libraries have radio sections, the ST Club (# 0602 410241) has half a dozen PD disks full of radio utilities. ST Club disks cost £1.25 each and every order carries a £1.25 handling charge regardless of the number of disks ordered.

Colour drivers

D Do you have any idea where I can get a printer driver for my HP500C colour inkjet printer?

B Hunt, Worcs

Oldie but goodie

D I have bought a second-hand 1040 STF for MIDI and music, but I didn't realise you could play such good games on the ST until I saw your 50th edition. My query is that you don't mention the STF; you only mentioned the STFM, STE, Mega ST and Mega STE machines. Do STFM and STE games work on my STF, and should I get a TOS upgrade?

Bas Bartelink, The Netherlands

A Your STF can use all ST games except those that are specified as STE only - Sleepwalker is the only STE only game we can think of so you have no need to worry about compatibility. You may be better off getting a TOS upgrade if you intend using a hard drive with your ST; early versions of TOS below v1.4 aren't particularly good at file handling.

contains the next one. Check the first bit of taga, a one indicates 16-bit FAT entries, a zero 12-bit. For the former simply multiply it by two and add it to the start of the FAT. The word at this address, after the bytes are swapped, is the next cluster for the file, or end of file - see the FAT Entries boxout.

12-bit entries are more complicated. Multiply the previous cluster by 1.5, add this to start of the FAT, ignoring the decimal, byte swap the word value stored there, then, if the cluster number is odd, right shift four places, and finally mask off the four high bits. With the

start address of the FAT in d4, and the cluster in d1, the following listing extracts the next 12-bit cluster:

```
move.w d1,d3
asr.w #1,d3 divide by 2
add.w d1,d3
```

```
move.b 1(a4,d3.w),d2
```

```
byte swap
lsl.w #8,d2
move.b (a4,d3.w),d2
```

```
move.w d1,d3
asr.w #1,d3 divide by 2
bcs cluster_even
lsl.w #4,d2
cluster_even
and.w #FFFF,d2
```

Once you have the next cluster, use this to find the next, and so on until you hit the end of file.

Root Directory

8 byte name
3 byte extension
attribute byte
10 reserved bytes
Word, creation time
Word, creation date
Word, first cluster
Long, length of file

Music and MIDI

More musical musings from Andy Curtis and his MIDI therapy group

TCB update

I've just been given ten disks full of TCB Tracker MODS but they won't load into my copy of Audio Sculpture. I asked a friend to check them and he says they are all OK but they won't work on anything but TCB Tracker. I don't think this is true because they load into my copy of the ESION Tracker OK, just not Audio Sculpture. Is there something wrong with Audio Sculpture?

Anthony Simons, Dorchester

stf: TCB Tracker uses a slightly different file format to the other sound trackers but it is easily convertible. The ESION sound tracker was specially designed to load TCB Tracker MODS and convert them, when saved, to standard format. The program doesn't tell you it is doing this, but it is.

You were very near to solving your problem, save all the .MOD files when you have loaded them into ESION and then they work with Audio Sculpture.

MIDI expression

I have been MIDI sequencing for quite a while but I am running into problems with the quantise feature of my sequencer. I like to play pieces with a lot of expression, that is, slowing down and speeding up so I don't like to use the metronome. However, when I come to quantise the pieces that I have done the music comes out all garbled. I thought quantise was there to help me to clean up my music, so is it really working?

Christine Brown, Cornwall

stf: What you need to understand is that the quantise feature of your sequencer is not a magic wand! If only it were. For quantise to be of use you have to play the original music as close to the beat as possible, this means having a metronome ticking away in the background. In simple terms, quantise "rounds up" notes to the nearest beat. If you are doing a quaver quantise (also known as eighth quantise) all of your notes are moved to the nearest quaver beat of the bar. If you have played without a metronome then your notes won't be anywhere near the beats of the bar at all - particularly if you are speeding up and slowing down, this is why you are getting problems.

When working with MIDI it is sometimes necessary to achieve results in a slightly different way, this means playing the notes in strict time and then changing the tempo throughout the piece afterwards. If you work at it you can produce music with a great feel. If you are convinced that you cannot work this way then simply use your sequencer as a multi-track tape recorder, just don't expect the quantise feature to work.

Fade to grey

I give up! I've tried everything and the only way I can get my MIDI music to fade out properly is to edit each individual note velocity using grid edit. It took me a whole afternoon to organise a nice smooth fade on my last piece of music. There has got to be an easier way. I use Cubase and I'm going to get v3. Please can you help!

Bill Titterton, Rosendale

stf: There are several different ways of going about this. A quick way to get a fade-out is to use the "baton" in key edit and simply paint the values on. Click on the "CTRL" button and a row of controller information

appears at the bottom of the screen. Move your pointer over the top of the bar until the hand appears and drag it upwards. You should now be looking at lots of vertical bars representing velocity. Select the "baton" using the right-hand mouse button and now you can paint the values you desire very quickly indeed for each part. Not only fades are possible, but swells and all manner of expression. Have fun.

Tuning samples

I have been collecting samples for quite a while now and I'm trying to make a complete collection so I can produce soundtrack music to order in any style. I have bought many samples from Public Domain libraries and also commercial ones. My problem is that so few of them are in tune with each other. When I load them into Audio Sculpture and play the same note with each sound, different pitches come out. Do you know if there's a way that I can rectify this?

Julien Deville, Hants

stf: This is a tricky little problem and one that needs patience to solve. The real trick is to use a reference tone, record a stable note on a tape recorder and have the tape handy. Using Soundlab (or any good sample manipulation package), load in the sample. Go to the tuning section and move the sample's pitch until it matches the tone on your tape. Now, click on the "Convert" (or whatever) button and the sample locks at the required pitch. Do this with all the samples you wish to use and they work well together.

You may need to play around a little with the pitch of the reference tone initially but, once you have it worked out, this is a foolproof method.

Unblock those nozzles

The nozzles on inkjet cartridges have a nasty tendency to become clogged with dried ink resulting in streaky printouts, this usually happens if the printer hasn't been used for a while. A quick and easy way to clear the nozzles is to steam-clean them, boil a kettle and pour a small

quantity of boiling water in a mug. Hold the cartridge half an inch over the hot water for about 30 seconds or so then wipe the cartridge dry with a tissue without touching the nozzles. Install the cartridge in the printer and try a test print, all the dried ink clogging the nozzles should have been removed. If it doesn't work the first time then you

may have to try a longer exposure to the steam.

Mark Jones, Bournemouth

A Thanks for the tip Mark, there are a couple of points we should make regarding your advice. First, it can be very dangerous to mess about with boiling water, it's dead easy to scald yourself if you're not

careful. Second, make sure that there is no moisture on the electrical contacts when you replace the inkjet cartridge back into the printer.

The STF address

Send all your ST related problems to ST Answers, ST FORMAT, 30 Monmouth Street, Bath BA1 2BW. Please indicate the type of problem on the envelope.

STOS corner

Billy Allan sorts out one more of your STOS problems...

Data glutton

I am writing a database program, but it takes for ever to load or save the data using OPEN, PRINT # and similar commands. Is there a faster way of accessing the data?

Mary Sweeney, Chester-le-Street

stf: There is a quicker way to do this. By copying the data from the array it's originally stored in into a memory bank then using BEAVE to save it, or conversely, use BLOAD to load the data to a memory bank then copy it back into the array. This listing should give you the general idea.

```
10 key off : hide : mode 1
20 dim NAMES(4), ADDRS(4), MON(4)
30 reserve as work 10,32000
40 print "Press <1> to enter data \
or <2> to view"
50 repeat : GS=INKEY$: until \
GS="1" or GS="2"
60 if GS="2" then goto 300
70 for T=0 to 4
```

```
80 input "Name :";NAMES(T)
90 input "Address :";ADDRS(T)
100 input "Amount :";MON(T)
110 next T
120 H=0 : S10=START(10)
130 for T=0 to 4
140 ST=VARPTR(NAMES(T)) : Q=0
150 for Q=0 to len(NAMES(T))-1
160 poke S10+H,peek(ST+Q) : inc H
170 next Q
180 poke S10+H,0 : inc H
190 ST=VARPTR(ADDRS(T)) : Q=0
200 for Q=0 to len(ADDRS(T))-1
210 poke S10+H,peek(ST+Q) : inc H
220 next Q
230 poke S10+H,0 : inc H
240 if H mod 2=1 then inc H
250 lobe S10+H,MON(T) : H=H+4
260 next T
270 lobe S10+H,0 : H=H+4
280 beave "DATABASE.DAT",S10 to S10+H
289 rem
290 rem VIEW DATA <
291 rem
300 S10=START(10) : bload "DATABASE.DAT",S10
310 T=0 : H=0
```

```
320 repeat
330 P=peek(S10+H) : inc H
340 NAMES(T)=space$(128) : Q=0
350 ST=VARPTR(NAMES(T))
360 repeat
370 poke ST+Q,P : inc Q
380 P=peek(S10+H) : inc H
390 until P=0
400 NAMES(T)=left$(NAMES(T),Q)
410 ADDR$(T)=space$(128) : Q=0
420 ST=VARPTR(ADDRS(T))
430 P=peek(S10+H) : inc H
440 repeat
450 poke ST+Q,P : inc Q
460 P=peek(S10+H) : inc H
470 until P=0
480 ADDR$(T)=left$(ADDRS(T),Q)
490 if H mod 2=1 then inc H
500 MON(T)=peek(S10+H) : H=H+4
510 L=lob(S10+H)
520 inc T
530 until L=0
540 for T=0 to 4 : print
550 print "Name :";NAMES(T)
560 print "Address :";ADDRS(T)
570 print "Amount :";MON(T)
580 next T
```

possible for me to convert it to run on my 1040STE or should I just get an ST mouse?
Neill Kirk, Essex

A No, you can't convert any PC serial mouse to run with your ST. Get a PowerMouse from Power Computing (☎ 0234 843388), it only costs £15.



Make sure your disk directories don't get mangled, use FMC in your Auto folder to prevent trashing your disks.

Missing files

Disks I'm suffering from a weird problem using my STFM, sometimes when I look at the contents of a disk in the drive window it lists a set of files. Later when I look at the same disk, it shows a different set of files even though I haven't deleted any or added any new ones to the disk. What's happening to my ST?

James Cope, Avon

A Some older STs don't always read the drive directory of a new disk automatically when you put a new disk in the drive. The drive

directory is a list of the names and physical locations of programs and files on the disk. Your ST should detect when a disk is removed and read the new disk when a drive window is selected or the file selector is called, so machines don't do this because of an error in the operating system.

This means that when you open the drive window you see a directory of the last disk to be used, this can lead to problems because your ST uses this list to save data to the disk. You could get over this by overwriting files on the disk because it saves data to areas marked as clear on the original that may contain data on the new disk. Disks can be completely destroyed by this problem.

The cure is simple, a small Auto folder program called FMC (Forced Media Change) makes your ST detect when disks have been swapped - it's available along with many other utilities on disk DMG.23 from the ST Club for £1.25. Call the ST Club on ☎ 0602 455250 for a catalogue.

Keyboard killer

Hardware I have another solution to the keyboard problem in ST Answers 53, where only the five left-hand keys of each row on the keyboard operate correctly. This can be caused by a multi-format joystick plugged in to the ST with the mode switch in the wrong position, the Quickshot QS-130F causes these exact symptoms if it is in MSX mode.

John Rogers, Nottingham

A Thanks for that information John, that's one solution that got past us. By the way, what's MSX?

Spare part surgery

Hardware I need to fix my ST with several replacement parts including a keyboard and power supply unit. Do you know where I can get these bits, and how much they cost?

Gary Marsh, Bradford

A The First Computer Centre stocks a variety of Atari spares including the parts you need. The keyboard costs £49.99 and the power supply unit costs £29.99. Make sure you take care when removing and handling the old power supply from your ST because some of the components can retain an electrical charge.

Stick the boot in

Hard Drive I have a new hard drive mechanism for my system that just refuses to auto-boot the first time my STE is powered up. After the initial failure to boot up, the drive always auto-

STOS CORNER

We told Billy Allan to get a life and he came up with a STOS version of a life generator. Weird

Playing God

I recently came across of a program which is called *The Game of Life*. I want to write a version in STOS, but I cannot find out the rules which govern the cells' growth. Can you help?

Frank White, Liverpool

stf: If there are less than two or more than three cells encircling the current cell then the current cell dies; if there are two cells around the current cell then the cell remains unchanged; if there are three cells around the current cell then the current cell becomes "alive."

The listing below is a very basic, and slow, life generator.

```
10 key off : hide : curs off
   : click off : mode 0
   : update off
20 dim G1(19,19),G2(19,19)
30 for X=0 to 19 : for Y=0 to 19
40 G1(X,Y)=rnd(1)
50 next Y : next X
60 rem
70 for X=1 to 18 : for Y=1 to 18
80 C=0
90 for X1=-1 to 1 : for Y1=-1 to 1
100 if X1<0 or Y1<0 then C=C+G1(X+X1,Y+Y1)
110 next Y1 : next X1
120 if C<2 or C>3 then C=0 : goto 150
130 if C=2 then C=G1(X,Y) : goto 150
140 C=1
150 G2(X,Y)=C
155 plot X*,Y*,C
160 next Y : next X
165 for X=1 to 18 : for
```

```
Y=1 to 18 :
  G1(X,Y)=G2(X,Y) :
  next Y : next X
170 if inkey$<">" then
  goto 70
```

Cheat and cheat again

In the intro to a game I am writing I want to have a 3D spaceship made up from dots flying around the screen. I know how to do 3D rotation, but even precalculating all of the points into an array it is still very slow. Is there any way I can speed this up a bit?

Jori Williams, Exeter

stf: The two listings below should help you out. The first precalculates the 3D object into a datafile by plotting all of the points and then by storing only the areas of the screen which have dots drawn on them. The second takes the datafile and draws the animation produced by the first listing.

Listing one

```
10 key off : hide : curs off
   : click off : mode 0
   : update off
20 palette$0,$444,$555,$70,$666,$70,$70,$70,$777
30 dim CL(3)
40 CL(0)=1 : CL(1)=2 : CL(2)=4 : CL(3)=8
50 for T=0 to NP
60 SPX$(T)=rnd(180)-90 : SPY$(T)=rnd(98)-2
70 next T
80 H=0 : S10=start(10)
90 for X=1 to 18 : for Y=1 to 18
100 if X1<0 or Y1<0 then C=C+G1(X+X1,Y+Y1)
110 next Y1 : next X1
120 if C<2 or C>3 then C=0 : goto 150
130 if C=2 then C=G1(X,Y) : goto 150
140 C=1
150 G2(X,Y)=C
155 plot X*,Y*,C
160 next Y : next X
165 for X=1 to 18 : for
```

```
: for T=0 to 48
160 for T=0 to NP
170 C=CL(SPX$(T)/-28)
175 P#=-1.0/(200.0/SPY$(T)+1.0)
180 plot SPX$(T)*P#+160.0,SPY$(T)*P#+100.0,K
190 SPX$(T)=SPX$(T)+2
200 next T
201 for S=0 to 31998 step 2
202 D=deek(logic+S) : if D=0 then goto 204
203 doke S10+H,S : doke S10+H+2,D : H=H+4
204 next S : loke S10+H,0 : H=H+4
220 cls logic : next Q
230 bsave "star.dat",S10 to S10+H
```

Listing two

```
10 key off : hide : curs off
   : click off : mode 0
   : update off
20 palette $0,$444,$555,$70,$666,$70,$70,$70,$777
30 open in #1, "star.dat" : close #1
40 reserve as work 10,L : load "star.dat",10
50 S10=start(10) : L=L+S10-4 : H=S10
60 logic=back
70 rem
75 cls logic
80 D=deek(H) : D2=deek(H+2) : H=H+4 : if D=D2=0 then goto 10
100 else
   doke logic+D,D2 : goto 80
110 if H=1 then H=S10
120 screen swap : wait vbl
130 if inkey$<">" then goto 75
```




STOS CORNER

Frank Charlton advances over the horizon to take over the STOS column

Squash, anyone?

I have recently started using STOS again after a long lapse, and I notice after loading a message tells me that STOS Squasher is available. I can't find any documentation, so I don't know how to get it to work, or what it exactly it squashes! I can't think where I even got it from in the first place.

Stephen Stockdale, Davyhumle

stf: STOS Squasher is a packer created specifically for STOS programmers, to crunch files like pictures, music or sprites down to a fraction of their size, and to expand them back to normal when the program runs. It wasn't sold on its own, but included as part of one of the early extensions.

What's the best way to use it? In a word – don't! Squasher is unstable at best, and not particularly efficient at packing, either. If you want to use packed files like this then use the excellent Missing Link extension – we gave it to you on Cover Disk S1 – which handles the standard file structures available in the PD. See page 92 if you missed it.

Help! I need somebody!

I am really fed up with STOS. I've got millions of problems. Is there a number I could phone for help? Some of the problems include turning off the <CONTROL> and <C> buttons.

Owen Rogers, Gwent

A Several companies supply the lead you want, contact Lightwave on 051 630 5003, they can provide the lead for £43.36.

Formatting problems

A I am adding my old ST external hard drive to my Falcon using the drive's SCSI connection. The drive was formatted using the ICD utilities, do I use the ICD software to re-format the drive for use with the Falcon or use the Atari HDX software supplied with the Falcon?

David Soldier, Worcs

A If the drive is already formatted then you should be able to read it straight away after booting the Falcon, the Atari driver software can detect drives formatted with ICD software. If you have problems reading the drive then use the Atari HDX software supplied with the Falcon and use the Install Devices command from the Options menu of the Falcon Desktop to locate the drive and create a drive icon. Save the Desktop and the next time you boot your Falcon the external drive appears on the Desktop.

A small voice

A How do I load sound samples into Quartet on Cover Disk S8?

W Weldon, Warrington

stf: There isn't an official STOS helpline, unfortunately. Your best bet if you want to learn is to follow the regular STOS features in ST FORMAT, and to look at some of the excellent disk magazines available. Best of the bunch is the STOSSER diskmag – available from all good PD libraries – which features some informative tutorials. If you're using the Compiler you can turn off the CTRL-C program interrupting by turning Break Checks to OFF in the Options Menu.

If you write in with full details of particular problems, we'll do what we can to help.

Compiler problems

I have just purchased the STOS Compiler and noticed that it doesn't contain the Compiler extension for the Interpreter, yet the extension commands are listed in the Compiler manual.

Simon Trundle, Hull

stf: Check your disk carefully – the Interpreter extension is the heart of the Compiler, so it should be there! Follow the installation procedure exactly as written in the manual, rather than trying to install the files from the Desktop. If you're still convinced the extension isn't there, it could be you have a faulty disk – try contacting the retailer you bought the Compiler package from.

Spectrum is green

I have asked Blackwing Publishing if the Spectrum S12 pictures on the registered copy of SpecCode are PD, but have had no answer. Do you know where I

putting it into an Auto folder I could only get a blank screen when I booted up my ST. I then changed the program to a PRG extension but it still doesn't run.

Chris Pawley, Perivale

A Your problem is probably arising because you are

can get PD disks full of Spectrum pictures? Also, is there a PD program to convert them to Degas or Neochrome format?

Bobby Newmark, Leicester

stf: We couldn't get through to Blackwing either, so the safest way is to assume that the pictures aren't PD. There are lots of quality Spectrum S12 images available from PD libraries – check out our regular PD Directory listing for addresses. Alternatively, PhotoChrome 3 or 4 converts GIF into format. The Shoreware paint package Croc Art does the best job we've seen of converting the S12 colour images down to a humble 16 colours, but you need 1Mbyte to use it. Both programs are available from PD libraries.

On the right track

I have the STOS Tracker extension to play Soundtracker music, but I don't have many tunes to use. Where can I get more tracker modules and STOS Tracker .ABK files? Can I convert Quartet music and samples to the MOD format to use?

Gary Bambrough, Choppwell

stf: You can find a huge supply of Soundtracker modules from PD libraries, or available for download from Bulletin Boards if you have a modem. FloppyShop (or 0224 586208) have a particularly good selection. You can convert the MOD files to STOS Tracker .ABK format with the program supplied on the STOS Tracker disk. Sadly, Quartet tunes can't be converted to MOD format, although it could technically be possible. If anyone's written a conversion program, we'd love to see it!

from ROM. Write your program again without using any of the GEM library commands of Hisoft Basic.

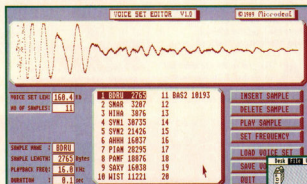
Hidden agenda

A How do you hide files on disks? I need to know because my sister keeps trashing all my files.

Ed Krol, Glasgow

A It's dead easy to hide files and safeguard them from being accidentally erased. The best thing for you to do is to make your files Read Only, this prevents them from being erased either by mistake or being overwritten by new versions with the same name.

Go to the Desktop and single-click on the file you wish to protect. Now go to the File menu and select



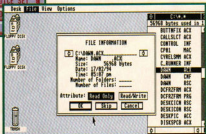
A You've got to use your voice! Use the Voices program to build voice sets of samples for use with Quartet.

for full details of building a voice set in our Quartet masterclass.

Password protection

A I have written a small password program using text and graphics using Hisoft Basic which I compiled into a program with a TOS extension. After

using GEM objects as part of your program, any program that uses GEM – windows, icons, menus, pointer – does not run if it is in an Auto folder. This is because programs in the Auto folder run before GEM loads into memory



OK, here we are at the File Information dialog box. Click on the Read Only button in the Attribute line to prevent your files from being erased. Turn to page 84 to learn more about file management in part two of our series on using the ST.

STOS CORNER

Frank Charlton chuckles and chortles his way through the latest batch of STOS conundrums

Music, Maestro please!

I would like to use some sampled sound in a demo I am writing in STOS and I was told that I need the STOS Maestro Extension to do this, but I can't find it anywhere. Is there any chance of getting hold of this or the elusive STOS Sprites, and is anyone planning to re-publish them?

David Wimbush, Crawley

stf: STOS Maestro and Sprites were both published long ago and Europress have apparently stopped supporting the STOS range of products now. Check through the mail order ads in STF, you may still find a company selling them off quite cheaply. A better bet is to try to get hold of second-hand disks, or better still, use the excellent Missing Link Extension which we gave you on Cover Disk ST1 – see page 90 if you missed it – that has far better sound sample replay routines, and you can pick up a cartridge to create the samples such as MasterSound quite cheaply. The Missing Link is Shareware though, and you need to pay £10 if you want to use it regularly in your own work.

Screensaver blues

Is there a screensaver which works with STOS? I've tried loads but they just never seem to kick in. Is it possible to write one in STOS as an .ACB? Could I write one in STOS anyway, even if it won't work within STOS itself?

Graeme Simm, Macclesfield

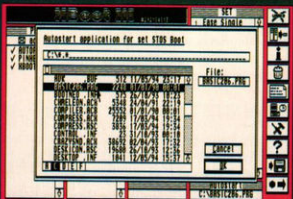
stf: We tried every screensaver we could find including Before Dawn and Rubik from past Cover Disks, and ours didn't work either. Screensavers normally run as GEM accessories or TSR (Terminate and Stay Resident)

Auto folder programs. They work by sitting in the background and checking regularly for GEM events such as mouse movement, text output or keyboard activity. If they don't detect anything going on for a set period of time, they start working until you interrupt them by using your STG again.

The snag with STOS is that it doesn't use GEM at all, so most screensavers won't work. For similar reasons, writing one in STOS whether as an ACB accessory or a compiled program to run from the Desktop won't work either, as STOS won't provide access to GEM to monitor the VDI and AES activity. If anyone has a screensaver which does work within STOS, please let us know!

Put the boot

I have just bought a second-hand home made hard drive which runs with the ICD Host Adaptor and driver software. When I copied my STOS folder to Drive C and put BASIC206.PRG in the Auto folder, STOS loaded as normal, but the mouse pointer wouldn't move. What have I done? I have an STE



■ **Having trouble booting STOS from your Hard Drive? Try setting it as the Autostart Application in a boot manager like XBoot 3 or SuperBoot.**

with 2MByte, STOS 1.62 and I use the XBoot 3 boot up program.

Lance Nicholson, Edinburgh

stf: We don't think you've done anything wrong, so we tried the same thing using an old drive formatted with the ICD software and the same thing happened to us. What you need to do is load STOS after GEM has initialised, that is, not from the Auto folder, with XBoot 3 (or any of the PD boot utilities), place BASIC206.PRG on the root directory of Drive C, and select it to be the autostart application. After everything has loaded from the Auto folder, GEM starts and STOS boots as normal. You do lose roughly 32K of memory doing this, but it's better than not running at all! If you have the same problem with a version of STOS older than 1.4, you'll need one of the PD startup programs such as START-GEM – available from most PD libraries or BBS Systems.

Printer problems

When I want a printed copy of my programs, I use the LLIST command in STOS but long listings seem to go off the right hand edge of my paper. Do you know any way to stop this happening?

Paul Broadhurst, Morecambe

stf: If your printer supports compressed text, you could always print your listings out using that. Alternatively, try saving the STOS program as an ASCII file which you can then print from the Desktop or a word processor. A STOS listing is normally saved in a "tokenised" format, which just looks like gibberish. Type the line as follows:

SAVE "FILENAME.ASC"

This tells STOS to save as ASCII. Printing from your word processor also gives you much greater control of how your listing looks on paper.

Out with the old

STORM I use 1st Word Plus but I am thinking about upgrading to something better because you seem to think that it's a bit out of date. Do you think I should get Protex 6? I need the program mainly for straight word processing alongside my DTP software and Protex 6 could easily handle my printer's hardware fonts.

Oliver Hilscher, Sheffield

A It sounds as though you have already convinced yourself to get Protex 6 already! 1st Word Plus is an excellent program

but it is nearly ten years old and looking a bit long in the tooth. Protex 6 is modern, fast and supports hundreds of different printers – upgrade to Protex 6, we have!

Amstrad? Who he?

NEWBORN I have an old three inch Amstrad floppy drive model no FD-1, is it possible to connect it to my STE?

J G Nicholson, Wakefield

A Sorry, it's not really feasible to connect an old Amstrad floppy drive to your STE even if it uses

a standard 34-way Shugart connection. The three inch drives were obsolete technology when they were first used in the CPC, PCW and Spectrum +3 8-bit computers. It's extremely unlikely that you can get a regular supply of three inch

disks any more, the last time we saw them advertised about a year ago they were selling for £3 each. Get yourself an 3.5 inch external floppy drive from Evesham Micros for £57.99, give them a call on 0386 765500 – it'll work out cheaper in the long run.

Nice and cheap

NEWBORN I am after a cheap hard drive but I don't know too much about them, what's the cheapest setup I can get including adaptors and cables?

Thomas Chappell, Preston

A There's no such thing as a cheap hard drive but the least expensive we could find are the FA-ST 522C from First Computer Centre 0532 319444 for £339.99; the Protar Profile 50DC from Analogic Computers 081 546 9575 for

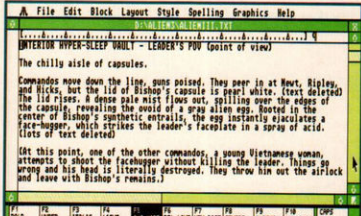
£249.95, the Data Pulse and 170MByte from Ladbroke Computing 0772 203166 for £270 and the Gasteiner 127MByte hard drive for £269 from Gasteiner 081 345 6000. You pay your money and you take your choice.

More Amstrad leftovers

NEWBORN I have just bought an Amstrad CTM 644 colour monitor for use with my STE having been assured by the owner that I could connect it as long as I get the correct lead made up. Where can I get the lead?

David Rae, Crawley

A Call Meedmore on 051 521 2202 with exact details of your ST and your Amstrad monitor and they can make you a lead to order, they normally charge around £15 to make up a special lead.



■ **That old classic 1st Word Plus. If you fancy changing your WP though, check out STF60's excellent head-to-head test of all the top titles.**

GOT A PROBLEM?

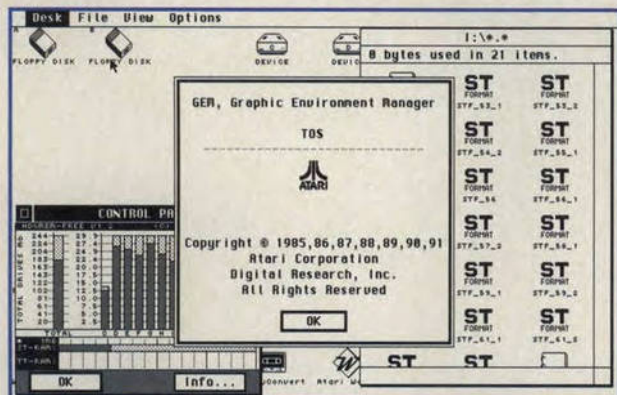
Send your ST related problems to ST Answers, ST FORMAT, 30 Monmouth Street, Bath, BA1 2BW. Please indicate the type of problem on the envelope.

Is it DOS?



Is TOS an operating system like DOS or is it built into GEM?

Simon Phoenix, Los Angeles



■ No no no no no no! TOS is nothing like DOS. Okay, some of the basic underlying IO commands might be closely related to their DOS originals, but TOS is totally different. It's got its own, unique, special character.

Er, TOS is an operating system but it's nothing like DOS at all. DOS is an old disk based command line operating system based on computing principles devel-

oped in the '60s for CP/M. TOS is stored in hardware rather than software and has GEM built into it rather than the other way around. TOS uses GEM as a tool to communicate with the outside world, using windows, icons, menus and the mouse pointer to initiate actions on screen.

als left. Try negotiating with HiSoft on ☎ 0525 71818.

Simply the best



Inspired by your DTP feature in ST FORMAT 59, I've decided to buy a colour inkjet printer and upgrade to 4MBytes of memory. I'm also getting some peripherals such as an external floppy drive. I'm thinking of getting the HP Deskjet 310 – is it the best colour printer in this price range? And which are the best picture converters and programs for colour output?

James Cribb, London

Michtron manual



I have recently got into comms using my ST and I want to use the Michtron BBS software, which you gave away with your Knife ST Cover Disk on ST FORMAT 42. Where can I get the manual from?

Mr Holme, East Sussex

All Michtron software, including the Michtron BBS, was originally distributed in the UK by Microdeal. All Microdeal software is now distributed by HiSoft AVR and they have a few Michtron BBS manu-

We're glad you liked the DTP feature enough for it to inspire you James. However, we should point out that DTP programs and colour picture files take up lots of disk space, and you'll be hard pressed to get much serious work done just

STOS CORNER

Frank Charlton continues to STOS about in the pages of ST Answers

Fish'n'Chipmusic

I am a STOS owner and I've registered the Shareware Missing Link Extension which was given away on ST FORMAT Cover Disk 51. My query is about the MUSAUTO command which accepts chipmusic from Mad Max, Synthdream and so on. How do I create music in these formats to play with MUSAUTO in my own STOS programs?

Andrew Nelms, Matlock

stf: Bad news, Andrew – you can't. The chipmusic formats you mention are commonly used in demos, and the programmers and musicians who created these music formats have never released editing software to create your own tunes. Some demo writers recycle the same music from one demo to the next, and you'll often hear the same tunes used repeatedly. Disks full of Mad Max and other music types are available from most PD libraries, so check with your favourite PD source (there's a list of libraries on page 57). Alternatively, you could use a ripper program to extract the music from a demo so you can use it. There are lots of these programs in the PD, and they all handle Mad Max format and often quite a few others, too.

Palette problems

I am busy writing a game in STOS, but whenever I place a sprite on the background screen it changes colour, because my background screen and sprite bank were created with two different colour palettes. Can I set up two separate palettes for sprites and screen, or do I have to go back and re-do some of them?

Jake Shepherd, Bootle

stf: Unfortunately, you'll have to re-do some of your hard work. The basic 16-colour limitation of the ST means you're restricted to one colour palette per screen without using special palette switching techniques. The Missing Link extension from ST FORMAT Cover Disk 51 (turn to page 90 if you missed it) provides commands for changing palettes in mid-screen, giving the illusion of more than 16 colours, but this technique is usually used to provide a separate set of colours for a score panel at the bottom of the screen. You can't actually use sprites designed with their own unique 16 colour

palette on top of a background screen using a different palette.

Rave on!

I'm getting fed up with the limitations of STOS. I'd really like to use samples in my games because I can't take the gritty little chip effects any longer. The sample playback routine I have from StereoMaster only enables me to use small samples, and the playback quality is pathetic as well. How can I use huge stereo STE samples, so I could shake the walls with a few booming rave soundtracks?

Philip Palmer, Peterhead

stf: Check out the special STE Extension we gave you way back on Cover Disk 32 – it enables you to play samples back using the STE's enhanced DMA output at 6, 12.6 and 25 KHz in mono or glorious stereo, and you can adjust the bass and treble too. If you want your games to be compatible with the older STFM machines you won't be able to use DMA sound, so check out the Missing Link extension for the best sample playback on standard STs. Remember both extensions are Shareware, so you'll need to register them if you continue to use them. Have fun shaking your walls!

Sequence dancing

Is there a STOS Extension that enables me to use or view the SEQ animation format used by CyberPaint?

Michelle Hubbard, Chester

stf: Nope, sorry. We've been asked this question a lot over the years, and the answer is still a negative one. There's not much info on the SEQ file format so no-one has bothered to write a STOS extension or routine to display CyberPaint animations. If you've written a routine to use SEQ animations within STOS, write to us and let us know!



■ You've asked often enough in the past, and now the answer is yes – you can use your Quartet tunes in STOS!

Quartet at last?

I know you've been asked before, but surely someone must have done it by now – can I use Quartet music from within STOS?

John Spartan, Keighley

stf: Yes! The program you want is called STOSPLAY, and Floppyshop PD (☎ 0224 586208) can supply it. Give them a ring for ordering details – the disk you're after is catalogued as MUS 3687. It's not perfect, because you can't access the disk while music is playing, but it works well and plays in stereo on an STE.

Back up your disks!

Finally this month, a word to those of you who have included disks with your letters requesting copies of everything from PD Extensions to replacement copies of your corrupted STOS disks – we can't do it! We spend so much time producing the magazine that we don't have time to copy disks, and we certainly can't provide new copies of STOS if you've managed to delete your originals.

Never work with an original STOS disk; always use a back-up copy to avoid unpleasant accidents. There's a wealth of extensions and bits of STOS code, all available from almost any PD library.



STOS CORNER

Frank Charlton steps up to the counter and faces the shop assistant. "Er, a quarter of strawberry STOS routines please" he mumbles, staring at the floor.

It's illegal

I have a S205TE and STOS. Every time I try to load the sprite definer a message appears on the screen saying "Illegal Direct Mode."

Tania Wilson, Leeds

stf: Make sure you load the sprite designer as a STOS Accessory—clear any other Accessories using the command ACCNEW at the interpreter prompt, then use ACCLOAD "SPRITE.ACB" to load the sprite designer. Press **CF1** to run the sprite accessory. You can't use the larger sprite banks supplied with the designer on a S205TE because the accessory uses a lot of memory. Never try to load a STOS

accessory from inside your own program—always load it from the interpreter prompt and you should be okay.

Wrong side of the tracks

I am having problems running programs from within STOS. The two most recent I have tried are Audio Sculpture and Quartet. When I call the program code from within STOS, I get an "Illegal instruction at line nn" error message—nn being whatever the first line of the BASIC listing is. This is happening even with the REPLAYBAS listing supplied on the Audio Sculpture Data Disk. Can you help, because I would like to use Quartet music and MOD files in my STOS proglets?

Ade Samm, Luton

stf: Good news and bad news, Ade—the STOS source supplied with Audio Sculpture doesn't work. You're not causing the fault, it just seems that the source was never

tested properly before release, because most of the listings supplied for other programming languages also fail to work without a lot of modification. We know it's odd and sometimes quirky, but the STOS Tracker Extension from the original STOS authors works well with MOD files using the conversion program supplied. Check your favourite PD Library and pick it up for the price of a disk. As for Quartet, you need a program called STOSPLAY, available from Floppysoph PD (0224 586208)—the disk's catalogue number is MUS 3687.

Unhappy extensions

For some reason any programs I load into STOS containing the command EXTENSION "S produce the error "EXTENSION NOT PRESENT AT LINE n" and stop the program. This also happens when I try to compile the program. Where am I going wrong?

Simon Trundle, Staleybridge

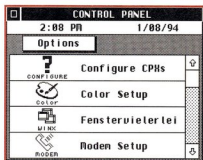
A We nipped around to the CD-ROM Today office and wowed your spec sheets at them. After a bit of head scratching and mumbling they were of the opinion that your CD player can't be used as a CD-ROM drive. The DIG. OUT socket on your CD player is only a single connection consisting of a signal conductor and a ground conductor with no provision for any control signals to be passed to the drive. In fact, the digital output from your CD player is designed to be used with DAT recorders with a digital input socket or with music hardware such as Akai sound samplers, and has no connection with CD-ROM.

No self XControl

A I'm having a problem with the XControl Panel Desk Accessory and my hard drive. Every time I try to boot up with XControl enabled on partition C my STE goes into a loop of crashing and re-booting and I have to initialise the hard drive from floppy disk. Is there something wrong with my STE (TOS 1.6) or hard drive? Everything else works okay.

Mick Colman, Basildon

A It sounds as though you either have a Desk Accessory clash or a CPX clash. Disable all your Desk Accessories and Auto folder pro-



■ XControl, one of the few concessions to GEM's maximum of six Desk Accessories. But doesn't it know it? It's a right picky little beast sometimes.

grams except XControl and re-boot your STE. If you still have the problem it may be a CPX clash—some CPXs are designed for the TT and Falcon and won't run on an STE, causing crashes when they load. Make sure you haven't got TTTIME.CPX in your CPX folder, because it's the usual culprit in cases like this. To disable a CPX you need to change the last letter of the file extender to Z



ASSEMBLY POINTERS

Tony Wagstaff heads home from his latest concert and tries to work out exactly which version of GDOS is installed in his desk drawer.

Record breaker

I'm writing a program that needs to keep a list of records in alphabetical order in the same way as a database. How do I insert and delete records quickly?

Mark Wright, London SE18

stf: Although the records are kept in order as far as anyone using the program is concerned, they don't need to be stored in memory in any particular order. Instead each record stores the address of the previous record and the next record, except of course the first and last records, which use zero as appropriate. This saves having to move a lot of the entries up or down whenever a record is inserted or deleted, which can save an awful lot of time. Instead, all that needs to be done is to update the addresses of the previous and next records. Any resorting can then be done when the user requests it, or maybe when saving the records to disk.

First we need to define our records:

```

segment
prev_record rs.l 1
next_record rs.l 1
field1 rs.l 1
field2 rs.w 1
record_end rs.l 0

```

After field1... to match the fields of your records.

The following routine will insert a record immediately after

another. A0 should contain the address of the previous record, and A1 the new record:

```

insert_after
move.l next_record(a0),d0
move.l a1,next_record(a0)
move.l a0,prev_record(a1)
move.l d0,next_record(a1)
beq quit_insaft
move.l d0,a0
move.l a1,prev_record(a0)
quit_insaft
rts

```

Next, we need a routine to insert a record before another. Again, A0 contains the address of the existing record, and A1 the new record:

```

insert_before
move.l prev_record(a0),d0
move.l a1,prev_record(a0)
move.l a0,next_record(a1)
move.l d0,prev_record(a1)
beq quit_insaft
move.l d0,a0
move.l a1,next_record(a0)
quit_insaft
rts

```

Finally, a routine to delete a record:

```

delete_record
move.l next_record(a0),a1
move.l prev_record(a0),a0
move.l a1,d0
beq chkpr

```

```

move.l a0,prev_record(a1)
chkpr
move.l a0,d0
beq quit_del
move.l a1,next_record(a0)
quit_del
rts

```

With these simple routines, adding and deleting records is as easy as an easy thing, on an easy day, in Easy... (Yes, that'll do—Trent)

```

move.l #record2,a0 *insert record2 before
record1
move.l #record1,a1
jsr insert_before

move.l #record2,a0
move.l #record3,a1 *insert record3 after
record2
jsr insert_after

move.l #record2,a0
jsr delete_record

has
record2 ds.l record_end
even
record3 ds.l record_end
even
record4 ds.l record_end

```

Moving screen

When using the Mod debugger, the screen border often shifts to the left by up to four characters when

stf: Every Extension you add to STOS has its own alphabetical identifier and interpreter, and Compiler Extensions are given the file extensions EX1 and EC2 respectively, with the ? replaced with the identifying letter. For example, STOS Maestro comes supplied as MAESTRO.EXD and ECD, and the Misty Extension is MISTY.EXM and ECM. No two Extensions can use the same letter, so occasionally when you install a new one, you might find it uses a letter already taken by another one. It's easy to rename the files from the Desktop to an unused letter so STOS recognises them, but if your listing contains the EXTENSION command, you'll get the error you describe. The simple solution is to change all such lines in your code to the new letter – if you'd changed the extension from ECS to ECW, just alter the offending lines to read EXTENSION "W and you'll be away. We suspect that the STOS listings you tried are the original STOS Tracker routines, as they use the file extender ECS and EXS – possibly you or whoever gave you the Extension changed it from ECS? Just change the code, and you'll be okay.

And finally, Esther

Here's a nifty little routine supplied by Mark Normington of Great Yarmouth to try if you're sick of using the old APPEAR command to fade a picture on to the screen. It uses SCREEN COPY to copy chunks of your picture on to the physical screen as if it was being poured from the top. If you find it runs a little fast, you can slow the whole procedure down by adding a WAIT command in place of the REM statement at line 55. A nice effect.

Mark's written another eight routines in a similar vein, and we'll try to squeeze them in whenever we have space. Cheers, Mark. We'll be sending you, er, hmmm... Well, we'll be sending you some, like, really positive vibes.

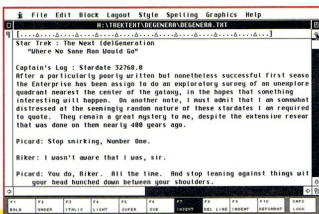
```
10 mode 0 : key off : flash off : hide : curs off :
15 click off
15 clr back : rem the sprite background is
cleared & used to grab a blank block for the drop
bit
```

```
20 reserve as screen 6 : load "YOURPIC.PIC", 6 :
get palette (6)
25 SCREENY=175 : SCREENX=0 : SCREEN=1
30 rem *** Main loop ***
35 for MSP=1 to 80
40 rem ** Block drop loop **
45 for SCREENY=25 to SCREENY step 25
50 screen copy 6, SCREENX, SCREENY, SCREENX+32, SCREENY+25
to logic, SCREENX, SCREENY : screen copy
back, 0, 0, 32, 25 to logic, SCREENX, SCREENY-25
55 rem Insert a wait here for a slower drop speed
60 next SCREENY
65 if SCREEN=1 then SCREENX=SCREENX+32 : if SCREEN=320
then SCREENX=SCREENX-32 : SCREENY=SCREENY-25 :
SCREEN=1 : goto 75
70 if SCREEN=1 then SCREENX=SCREENX-32 : if SCREEN=
320 then SCREENX=SCREENX+32 : SCREENY=SCREENY-25 :
SCREEN=1 :
75 next MSP
```

instead of XE, you can also crash your STOS or STFM by changing resolution between medium and low with XControl Installed, although it's safe to do this if you have TOS 2.06 installed.

Colour drivers

I want to use Protex 6, 1st Word Plus and other text-based software with my Panasonic KX-P2123 and colour kit. How can I get these programs to work correctly?
Samuel Davies, Milton Keynes



switching between Mon's screen and the output program. I, this is a hardware fault with my machine?
Jim Beard, Halifax

stf: 5 mhz clocks that display the time on the menu bar can cause this problem with programs that have two screens. Degas is another casualty. Try removing all Desk Accessory Autos programs and any other memory-resident programs – it's probably one of these causing the problem rather than your machine.

Speedo

I'd like to try some of the new VDI calls for Speedo GDOS in assembly? How do I check if it's loaded?
Marvin Grange, Southampton

To use the new features, you need to check first what version of GDOS is present, using the vq_gdos call

```
move.l #2, d0
trap #2
```

DDI now contains one of the values in the Which GDOS boxout. To differentiate between Speedo and FSM one further check is made: the FSMC cookie

```
move.l #FSMC, d1
lea p_value, a1
jar cookie
bne
p_value, 1, 1, 1
test
```

```
getcookie
*on entry
*%E=address to return cookie value, or 0 if not needed
*d3=target cookie
*returns
*d0 = 0 not found, 1 found
*d4 = number in jar if found
move.l #1, -(a7)
move.w #220, -(a7)
trap #1
test.l #6, a7
test.l d0
bne.s .user
clr.l -(a7)
move.w #220, -(a7)
trap #1
addq.w #6, a7
movea.l d0, a3
bra.s .super
user: movea.l a3, a3
super: movea.w #25A0, a0
movea.l (a0), a4
move.l a3, d0
beq.s .nosmp
move.l a3, (a7)
moveq #220, d0
move.w d0, -(a7)
trap #1
addq.w #6, a7
.nosmp: clr.l d4
movea.l a4, d0
beq.s .return_zero
.return_zero:
try next
```

```
move.l (a4), d0
cmp.l d3, d0
bne.s .not ours
movea.l a5, d0
beq.s .no p_value
move.l a4, (a5)
.no p_value:
moveq #1, d0
bra.s .return_ours
.not ours:
addq.l #1, d0
movea.l a4, a0
addq.w #8, a4
test.l (a0)
bne.s .try next
.return_zero:
moveq #0, d0
.return_ours:
rts
```

If the address in (a5) contains 'SPD' then Speedo is installed.

Which GDOS?

Check these values to determine which version of GDOS is running.

Value in d0...	Version...
-2	No GDOS
Any Other	GDOS v.1.x
\$5F464654 'FNT'	FONTGDOS
\$5F46534D 'FSM'	FSM or Speedo

A Printing in colour correctly with word processors depends on the printer drivers supplied with the software. Your KX-P2123 has an Epson emulation mode, so just select colour Epson printer drivers from your programs until you find one that works correctly. You should have no problems with Protex 6 but older programs like 1st Word Plus probably won't have colour drivers – you'll have to live with mono output in some cases.

B Clive demonstrates 1st Word Plus' usefulness for typing up alternative Star Trek scripts. He'll have trouble printing them in colour, though.



GFA WORKSHOP

Mac Marsden, a man barely alive. We have the technology to rebuild him. We can make him better, stronger and faster. He will be, in fact, the world's first ever ironic man.

File copy?

I'm trying to write a disk utility program and I have become absolutely stuck. I don't seem to be able to find a routine to enable me to copy a file from a floppy disk to a hard disk.

Bob Jackson, Yaddlethorpe

One method of copying files from one drive to another is listed below. Remember that it is important to enter the full pathnames of the source and destination files and drives like this:

"A:\FORMAT.PRGM", "C:\ST\MAG\INFO\FORMAT.PRGM"

Do not, whatever you do, try to copy the file to itself, because this may erase your disk permanently.

```
PROCEDURE copy(SOURCE$, DEST$)
LOCAL block%
OPEN "I", #1, SOURCE$
OPEN "O", #2, DEST$
block% = LOF(#1)
WHILE block% < 32000
PRINT #1, INPUT$(32000, #1);
SUB block%, 32000
WEND
PRINT #2, INPUT$(block%, #1);
CLOSE #1
CLOSE #2
RETURN
```

Sort me out

I am unable to get to grips with programming a Sort routine in GFA Basic. What I am trying to do is to sort an array of numbers into ascending order. I know this should be a simple task but it really has got me baffled. Can you please help?

Graham Knee, Ouston

Anything is easy once you have done it once. We've included a simple listing below to enable you to understand exactly what is going on. The code is known as a recursive sort, because after the first pass of the outer loop, you know the largest number in your array is at a(10) and therefore you don't need to look at that number again.

```
DIM a(10) ! SET UP NUMERIC ARRAY
FOR f=1 TO 10
a(f)=RANDOM(50) ! FILL a() WITH RANDOM
WHOLE NUMBERS
NEXT f
counter=9
temp=0 ! TEMPORARY VARIABLE
FOR outer = 1 TO 10 ! OUTER LOOP
FOR inner = 1 TO counter ! INNER LOOP
IF (a(outer) > a(inner))
temp=a(outer) ! PASS LARGER NUMBER
TO TEMP
a(outer)=a(inner) ! MOVE LOWER
NUMBER UP LIST
a(inner)=temp ! RE-INSERT LARGER
NUMBER UP LIST
ENDIF
NEXT inner
counter=counter-1
NEXT outer
```

Moving graphics

I have been using GFA Basic for six months and would love to begin programming moving graphics, beginning with a line moving on screen and then disappearing when the next line is drawn. Could you please print a small routine to do this?

Adrian Robson, Carisbrooke

The trick is to draw the line twice with a slight pause in action between changing the drawing colours. The listing below draws a random line on screen, pauses for one second, overwrites the original line, and then draws another line a split-second later.

```
a$=""
DIM a(4) ! FOUR CO-ORDINATES OF OUR LINE
DO
' CHECK FOR KEYPRESS
a$=INKEY$
' FILL ARRAY WITH RANDOM CO-ORDINATES
FOR f = 1 TO 4
a(f) = RANDOM(200)
NEXT f
' SET DRAWING COLOUR
SETCOLOR X,Y,Z
' DRAW LINE
LINE (a(1),a(2),a(3),a(4))
' PAUSE FOR ONE SECOND
DELAY 1
' SET DRAWING COLOUR TO BACKGROUND COLOUR
SETCOLOR X,Y,Z
' DRAW SECOND LINE
LINE (a(1),a(2),a(3),a(4))
LOOP UNTIL a$ <> "" ! LOOP UNTIL A KEY IS PRESSED
```

We have left the SETCOLOR X, Y, Z open because you didn't indicate which screen mode - low, medium or high



STOS CORNER

This month Frank Charlton resolutely avoids any vaguely dodgy STOS jokes.

Screen-savers again?

In the August issue of ST FORMAT some one wrote in asking for a screen-saver that works in STOS. The Boink screen-saver is one such program. I hope this proves useful.

John Henderson, via AdLib BBS

That's great news, John - cheers. Boink displays a bouncing Atari Fuji symbol when it kicks in, and it's quite old now, so your usual PD library or favourite BBS should have it in their collection somewhere. We use a copy now at STF too, to save our monitor during those lengthy STOS sessions.

Tandem for two

Here's a tip for using Extensions with STOS. Normally STOS only checks the drive it was booted from for the STOS and COMPILER folders, so your Extensions need to be on the one disk. You can load them from your external disk drive if you use the Tandem program from ST FORMAT Cover Disk 56 (see page 89 if you missed it). Copy the STOS and COMPILER folders with the extra Extensions to Drive B, and Tandem fools your ST into thinking they're all on the same disk. You need to copy Tandem to the Auto folder of

your boot disk, and it needs to run before STOS to work.

Ijaz Hussain, Birmingham

Thanks for that useful tip, Ijaz. Now you're not limited to using just a few Extensions crammed on to one disk.

Virtual reality

Would you consider putting STOS 3D on the ST FORMAT Cover Disk, because I have heard Mandarin have stopped producing it?

Sonny Cotton, St Austell

It seems as if Europress Software have stopped production of the entire STOS range of products. However, there still appears to be lots of interest in STOS 3D, so we've arranged a little special offer. If you're a subscriber to ST FORMAT (and if you're not, why not?) we have a limited number of copies of STOS 3D available at the highly reasonable price of £9.99.

Blitter rotation

I've seen some really good 3D rotation effects on my friend's SNES console games - can I do this on my ST using the blitter chip?

Calvin Latimer, East Kilbride

Unfortunately not - the blitter is only useful for moving chunks of graphic data about without using the processor time of

your ST's main CPU. The effects you mention on the SNES are all done with chips that were specifically designed for that machine. That's all these chips do, and they're very good at it.

Quiz of the week

I've come up with an idea for a quiz program, and I've written some of the basics of it. I would like to ask the player a question selected at random from a possible 200 questions. I've got as far as being able to select the question, but now I don't know how to match up a random question with the right answer.

Adrian Wherry, Kilmarnock

Presuming you're storing your questions in DATA statements, you can use arrays to hold both questions and answers. If you've established the array at the start of your program with a line like:

```
10 DIM question$(200)
```

add another along the lines of:

```
15 DIM answer$(200)
```

to store the answers. You can either add the DATA statements containing the answers after the sequence holding the questions, or interleave them like this:

```
1000 DATA "This is Question
```

```
One..."
1010 DATA "And this is the answer
to Question One."
1020 DATA "This is Question
Two..."
```

All you need to do (at the point in the program that reads the DATA statements) is add an extra line to read each answer as well. For example:

```
50 FOR X=1 TO 200
60 READ question$(X)
70 READ answer$(X)
80 NEXT X
```

If your randomising routine chose question 65, the question is held in question\$(65), and the answer in answer\$(65). It isn't the most elegant way to do it, but it's a starting block for you to work from.

CyberPaint sequences and STOS

Many moons ago, back in ST FORMAT 62, (all right, not that many) Michelle Hubback asked if it was possible to use animation sequences in CyberPaint SEQ format within her own STOS programs. Tony Greenwood from the inimitable Stosser diskmag has written in to tell us that it is possible. Stosser featured this routine on a previous issue, and you can contact Tony at: 29 Paxton Street, Accrington, Lancs BB5 1QQ for details.

resolution – you are using. Pages 251-253 in the GFA manual tell you the values to use for your chosen screen resolution. Just enter the correct values in SETCOLOR X, Y, Z.

Nice but...

What is the DIM statement used for?
James Cope, Bath

The DIM statement is used to reserve memory within the machine so that numbers or characters may be held there instead of being loaded from disk when needed.

Back to basics

What is the difference between an integer and floating-point number?

David Jones, Northfield

An integer number is a whole number – 1, 5, 15, 100 and so on – and a floating-point number is a decimal number – 1.232, 3.14952, 10.23, that sort of thing.

Please wait

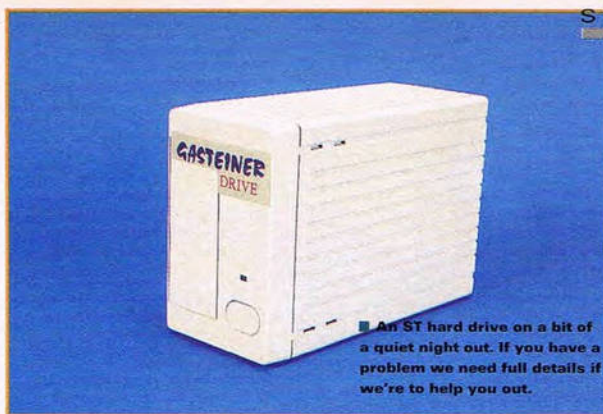
I need a routine that will pause a program while it waits for a mouse button to be clicked?

Stanley Ipkiess, Edge City

One way is to use a simple loop:

```
DO
  ' PUT YOUR PROGRAM HERE
LOOP UNTIL MOUSEK
```

The code will then continue until a mouse button is clicked.



■ An ST hard drive on a bit of a quiet night out. If you have a problem we need full details if we're to help you out.

formatted? Is it even designed for your ST? You see the problem we have answering this question. Write to us again and provide us with full details such as make, model number, where you bought it and the software supplied with it. It's also a good idea to let us know exactly which ST you have.

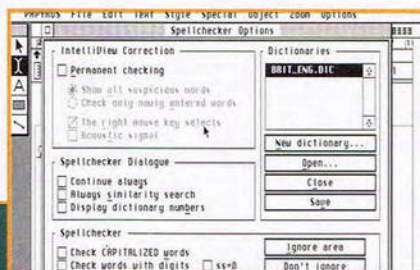
SpeedoGDOS

I have SpeedoGDOS for my 1040STE and I am having a few problems. Whenever I try to run Hyperpaint 2 or Timeworks 2 I get error messages such as: "not enough memory for scratch buffer" and "do not use special effects". You have said in ST FORMAT that you can use

SpeedoGDOS with any GDOS compatible program, so what's the problem here?

David Magni, Farmborough, Kent

Memory. To run SpeedoGDOS effectively you must have at least 2MBytes of memory in your STE, especially if you want to run 1MByte-only programs like Timeworks 2 alongside SpeedoGDOS. Invest £50 in a couple of 1MByte SIMMs and install them in your STE to take you up to at least 2MBytes of RAM. You know it makes sense.



■ Papyrus Gold running on an STE with 4MBytes of RAM. Look at that power. If you want to run serious software, you need serious memory.

Cover Disk 53 it informs me that I have 512K in memory bank 0 and 2,048K in memory bank 1, yet I only have 1,024K of ST RAM available in total. UVK also informs me that I only have 1,024K of RAM. Many of my programs alert me to low memory – can you help?

Zakaria B Din, Taiping, West Malaysia

The problem is probably caused by a bad connection somewhere in your installation. Take a look inside your ST and carefully check the upgrade against the instruction manual. If you can't find the problem then we suggest you take your ST to a local electronic repair store – sorry we can't be of more help. We contacted Power Computing who suggested you write to them at: 44a/b Stanley Street, Bedford MK41 7RW, explaining your problem – they have an excellent technical department.

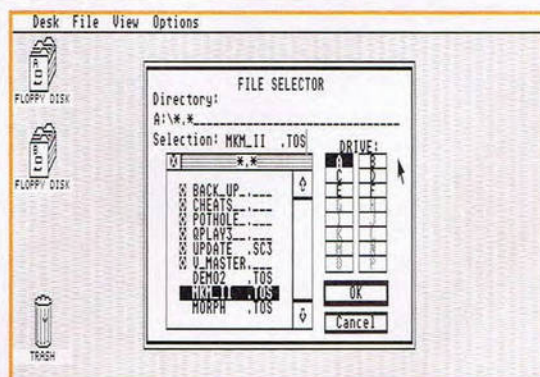
Select me!

I want to unpack the Medieval Chess program on ST FORMAT Cover Disk 62. I have used your Cover Disk

Menu program but when the instructions say the file selector is supposed to appear the item selector appears instead. This happens with all of the programs on the Cover Disk.

Anthony Youd, Gateshead, Tyne & Wear

Ah. Actually, the file selector

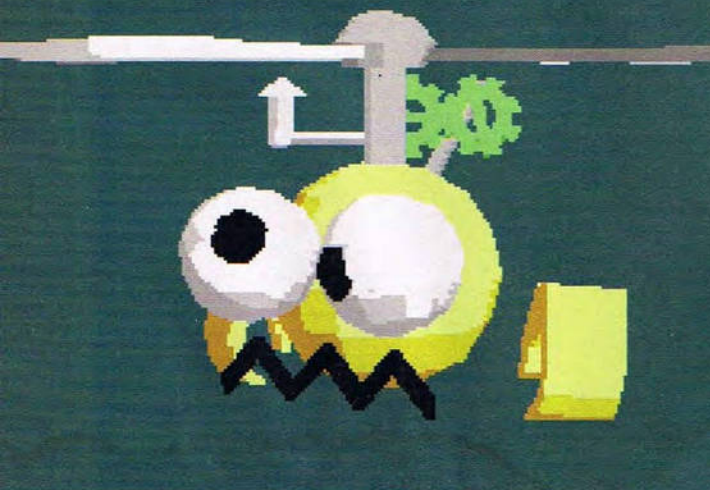


Vanishing RAM

I have a 2MByte memory board from Power Computing installed in my 520STFM, giving me a total of 2.5MBytes of RAM. When I run Knife ST from Cover Disk 42 it tells me that I have 2,560K of RAM installed. However, when I run Sysinfo from

See this file selector? Well, it's actually an item selector working under an assumed name.

tor is just another name for the item selector – different versions of TOS call it by different names but it's exactly the same thing. Just follow the instructions and use the item selector whenever they say "file selector" and you'll soon be playing Medieval Chess.



Stosser has gone from strength to strength, and Tony tells us he's never missed deadline in 17 issues. There are some excellent routines and tutorials to be found on the disks, and they're well worth taking the time to read.

The CyberPaint routine was written by Andy Cato of Newcastle, who's a reg-

Now you can use these flashy CyberPaint animations in your own STOS programs, thanks to the hard work of Andy Cato.

ular Stosser contributor, and it's a real little smasher (as they say up North). Cheers, Tony and Andy!

ST ANSWERS

Clive Parker unplugs himself from FutureNet and takes a look at this pile of ST Answers.

Using icons

SOFTWARE I have noticed in the features about icons you say that TOS 2 icons can only be used on STs with TOS 2.06 installed. I have been using TOS 2 icons on my STFM with TOS 1.4 for some time using Teradesk, the PD replacement desktop.

Colin Thurlow, Canal Side, Scotland

A Yes, you can use Teradesk to display TOS 2 icons. Use Icon Juggler to sort out a set of icons and save the file with the name ICONS.RSC to your Teradesk installation disk. Teradesk can now use all the icons in the same way as TOS 2.06 does.

Upgrade misconceptions

HARDWARE What is the best upgrade for my 1040STE? I want to upgrade it to 4MBytes so that I can use Xenomorf 2 but I only have £100 to spend. When I have 4MBytes will I be able to play Falcon030 games?

Scott Booth, Co Tyrone, NI

A All you have to do to upgrade your 1040STE is remove the four 256K SIMM memory boards that are inside, and replace



■ This is a Falcon030, not an STE. You can add as much RAM as you like to your STE but it won't magically turn into a Falcon. If it did then Clive would be making a fortune buying second-hand STEs and turning them into Falcons.

them with four 1MByte memory boards. You can get 30-pin, 100ns (nanosecond), 1MByte SIMMs from almost any computer retailer for about £25. If you don't have a local computer shop then contact Marpet Developments on 01423 712600, they can supply you with the SIMMs you need.

Upgrading your STE to 4MBytes enables you to use Xenomorf 2 to its full extent apart from the image display – your STE is still restricted to displaying 16 colours at most on screen.

Upgrading the memory doesn't increase the STE's imaging capabilities, although you can still use Xenomorf 2 to create 24-bit images – you just can't display them on a standard STE.

You can view images with more than 16 colours using Photochrome 4, an excellent PD image viewer and converter available from all good PD libraries – see page 46.

Adding extra RAM to your STE doesn't turn it into a Falcon030. The Falcon is a completely different computer to the ST, although it is

compatible with some ST software. While you can run ST software on the Falcon030, you can't run Falcon software on the ST – there are just too many hardware differences. Take a look back at ST FORMAT 53 for full details of the Falcon's capabilities (and if you missed it turn to page 85).

Filemaster FD wanted!

SOUND I am looking for a MIDI editing program called Filemaster FD, designed to edit files for many different sequencers. Until recently it was distributed by Four Minute Warning in West Yorkshire but it is no longer available. Do you have any idea where I can get it from?

Daniel Affleck, Margate

A If anyone has a copy of Filemaster FD by Mississippi Software they wish to sell then please contact Daniel at: 4 Godwin Bungalows, Godwin Road, Cliftonville, Margate, Kent CT9 2HQ. Or you can call him on 01843 232282.

Which printer?

PRINTERS I have just purchased an STFM and upgraded it to 1MByte of RAM. I now want to buy a printer but I don't

STOS CORNER

Frank Charlton digs through the mighty STOS mailbag and comes up with a way to increase the palette of the STOS Sprite Editor on the STE.

Spritely fun

You can update the original STOS Sprite Editor to work with the enhanced STE palette, giving you 4,096 colours to choose from instead of the original 512. You need to have the STOS STE Extension installed for this to work. Just follow these steps:

1. In the STOS interpreter, load the STOS Sprite Editor directly – not as a STOS accessory – by typing in the following command:

```
LOAD "SPRITE.ACB"
```

2. Change line 35 to the following:

```
35 for x=0 to 15 : PAL(X)=colour(X) : next x
```

3. Delete line 60.

```
4. Add the following line:
90 for x=0 to 15 : e colour X,PAL(X) : next x
```

5. On line 30, change the value of RGBTX to 7.

6. Change line 850 to the following:

```
850 for x=0 to 15 : e colour X,PAL(X) : next x : gosub 11300 : gosub 11375
```

7. Alter line 3530 to the following:

```
3530 RGB=e colour(OLDLC) : RGB(0)=(RGB and $f00)/256 : RGB(1)=(RGB and $f0)/16 : RGB(2)=RGB and $f
```

8. Change line 3535 to:

```
3535 for y=0 to 2 : locate RGBTX-1,RGBYT+Y*2 : print str$(RGB(Y))- " " : next y
```

9. Change the last part of line 3565 to:

```
if X<0 or X>15 then goto 3545
```

```
10. Alter line 3570 to:
3570 sprite C+2,XM,RGBY(C),12 : RGB(C)=X : locate RGBTX-1,RGBYT+C*2 : print str$(RGB(C))- " " : e colour OLDLC,C
```

11. Change the last part of line 3595 to

```
e colour OLDLC,RGB
```

12. Change the last part of line 6110 to

```
PAL(X)=e colour(X)
```

13. Alter the beginning of line 6115 to

```
e colour X,PAL(X)
```

14. Alter the last part of line 8238 to

```
e colour X,PAL(X)
```

15. From the start of line 10850, delete these parts:

know which one is suitable. Which printers are likely to be compatible with my STFM?

J J Baker, Ripley, Derbyshire

A In a nutshell, any Epson compatible printer should work with an STFM. When you buy a printer – dot matrix or inkjet – take a look in the manual for details on how to set it to Epson mode. Most of the time you can just select Epson printer drivers from your software if your specific model isn't actually listed in the Printer menu.

When selecting software, ensure that it has a good selection of printer drivers – Protect has hundreds of the things – and avoid older programs like 1st Word Plus which only have limited printer support.

If you want a dot matrix printer, 9-pin or 24-pin, then you won't go far wrong if you select a Citizen, Panasonic or Star printer. If you want an inkjet/bubblejet then choose a Star or Canon model. All these printers are totally compatible with the STFM.

Spectrum 512

A Back in September 1992 you gave away the Spectrum 512 program on your Cover Disk. Is it still possible to get the manual?

Eric Lathewell, Northampton

A The manual was available for £15 from GST Software – give them a call on 01753 549442 to see if they still have any

copies. If you still have that back issue of ST FORMAT then take a look at the details on the special offer form.

Bookworm

A I am looking for the MIDI and Sound Book for ST, apparently it is no longer in print. If any ST FORMAT reader has a copy they don't want could they sell it to me?

Mr L Russell, Ramsgate

A Blimey, someone else wants something from one of our readers – and he's from Kent too! Okay, if anyone has a copy of the MIDI and Sound Book for ST for sale, write to Mr Russell at: 1 Drybeck Avenue, Nethercourt Estate, Ramsgate, Kent CT11 0NX.

You should really send this type of query to the new ST FORMAT Reader Ads page – turn to page 82 for details. Don't forget that ST FORMAT reader ads are completely free. Gratis. They cost you nothing except the price of the stamp. And the envelope.

Corrupted disk

A Last month I used the new Menu program on your Cover Disk to unpack the software included. My problem is that I have ended up with a disk with half a game and a corrupted Cover Disk, and I didn't make a backup of the disk.

Steve Lewis, Milton Damerel, Devon

A Always, always, ALWAYS make a backup copy of your Cover Disk before you run any of the software on it, and that includes the Menu program. Make sure that the

first thing you do when you take the ST FORMAT Cover Disk out of its little baggie is to write-protect it by moving the little tab so that you can see through the hole.

You didn't say which disk you corrupted in your letter Steve. If you write to the Disk editor Nick Peers enclosing the disk he'll send you a replacement disk.



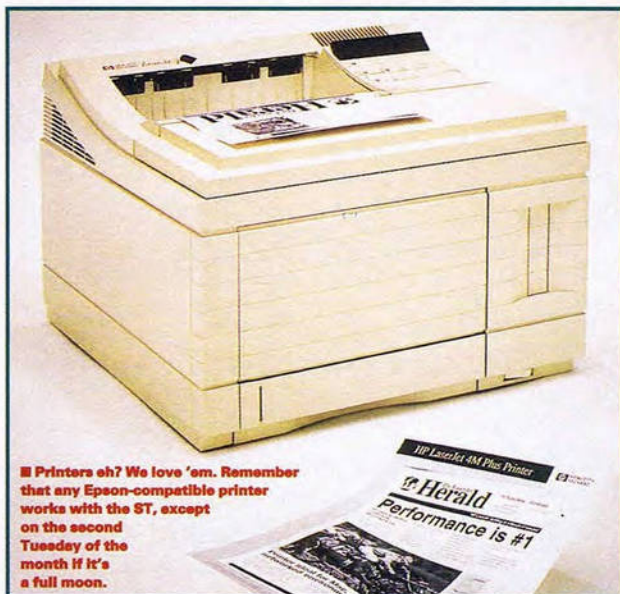
■ Having trouble with your Cover Disks? Back 'em up, we say. Write-protect them too, and you'll avoid problems.

Old, old printer

A After having no problems using my Amstrad DMP 2000 printer to print text, I find that I am now having problems generating graphics output. All the instructions in the manual have examples in Amstrad Basic, BBC Basic and Commodore 64 Basic. Is there any way I can adapt these programs to print graphics using my ST?

Keith Whitnall, Oldham, Lancs

A Your main problem is that you have an old, old printer. The Amstrad DMP 2000 was specifically designed for use with the old 8-bit Amstrad computers about ten years ago. While the control codes used by the printer are just about



Fade 1 : wait 7

16. Delete line 10851

One last thing, to use the extended sprite palette in your own programs, use this line:

```
A=hunt(start(1) to
start(1)+length(1),"PALT")+4 : for B=0 to
15 : e colour B,deek(A+B*2) : next B
```

This gets the correct sprite colour palette. Note that the command:

```
P=palt(start(1))
```

used in *The Missing Link Extension* doesn't retrieve the correct STE palette.

Scott Eyans, Cardiff

stf: Phew! Thanks for that, Scott – you obviously put some work into that. Now every STE-owning STOSser can update their sprites. Be warned, though – always do something like this on a backup, and not the original.

Stosser no more!

We were going to run a story here about the fact that Stosser is no more – except that at the last minute we discovered that it is in fact now to continue – see the News pages for the full story (page 11).

The magazine has now been taken over by Bob Goodfellow, who you can contact at: 2a Colvin Street, Dunbar, East Lothian, Scotland. Don't forget that Stosser can only continue with your support, as one of our readers pointed out in a letter in our Feedback pages. Send your STOS routines or any other ideas or articles to Bob – it's your contributions that keep magazines like Stosser alive.

Pick a packer or two

I have a second-hand copy of STOS and the STOS Compiler, which I use for producing simple games for my family. I used to use GFA Basic, and I now notice that STOS produces huge files after I've compiled them to disk.

I want to get each game and its data files on to a single disk, because my children can get confused when swapping them about. I've heard about program packers, but there seem to be lots of them!

Which are best for reducing the size of my compiled programs on a 1MByte STE?

Jack Braun, Shelley

stf: Most games and demos written in STOS are packed using one of three popular packers – Packice 2.40, Atomik 3.5 or SpeedPacker 3. In terms of overall reduction in size and unpacking speed, there really isn't that much of a difference, but SpeedPacker is slightly different in that the code for unpacking isn't attached to the packed program, which is why they're slightly smaller. You need to put a little program in the Auto folder to do the job. Any of the packers will do, and they're all available from your favourite BBS or PD library – turn to our Public Sector pages (page 46) for a list of libraries.

Missing Link registrations

Remember the whizzo *Missing Link Extension* we gave you on ST FORMAT Cover Disk 51? The original programmers aren't handling the registrations any longer – instead Mike Goodman at Goodman International PDL is now supporting *The Missing Link* and the *Misty Extension*.

Both shareware fees are the same as before, but you need to get in touch with Goodman International

ST ANSWERS

ST FORMAT's own infobahn warrior, Clive Parker, tackles your problems, ranging from printer drivers to the really ridiculous.

Starball problems

DISK I'm having trouble with running *Starball* from the ST FORMAT Cover Disk 64 – the game always bombs out. When I unpack the file I get a message saying that the data is damaged. Please put a fixed version on your next Cover Disk.
Rafay Qadin, London

A It sounds like you have a faulty Cover Disk. With such a large number of disks duplicated every month one or two are bound to be faulty. Just send your faulty disk to: ST FORMAT November Disk Returns, PO Box 21, Coventry NN1 5BU with a padded self-addressed envelope (no need for a stamp on it) and a note explaining that you need a replacement disk. Full instructions for disk

problems are included on the Cover Disk pages every month.

DIY floppy

HARDWARE Can I build an external floppy drive using the internal drive from a broken STF? What parts do I need and where can I get them?
Marco Spelde, Almere, Holland

A You could possibly build an external drive using an old internal drive, although it would probably work out less expensive to buy a new external drive. You need a suitable case, an internal regulated power supply unit and a 14-pin DIN-to-Shugart cable. We're planning a feature on building an external floppy drive in ST FORMAT soon.



■ It's just as cheap – if not cheaper – to buy a new external drive as it is to build one from spare parts like some demented mad scientist (with a fetish for joystick leads).



■ *Starball* on Cover Disk 64. Nick, Simon and Trent have hardly done any work this month, yet again, because they've been playing it so much.

Radio ham

SOFTWARE I am interested in using packet radio with my STE. Is there any software available to do this?
Paul Brooks, Downham Market, Norfolk

A Indeed there is Paul. There are no commercial packet radio programs that I am aware of but there are several useful PD programs you can use. Worli is a program designed to enable you to run a packet radio bulletin board complete with 150K manual, while Packet is a comprehensive general purpose packet radio program. Call one of the PD libraries listed in our ST Directory (page 71) and tell them exactly what you need – they'll be glad to help you

out. Make sure you remember that most packet radio software only runs in high resolution.

The plot thickens

PRINTERS I have a Hewlett Packard plotter, model 7221b. Can I link it to my STE and what software can I use with it? Can I use a standard art package?
Steven Good, Cramlington, Northumberland

A Almost all plotters use a standard parallel Centronics interface, so you can connect it to your STE using a normal printer lead. Your problem lies with software. Plotters are designed to be used with CAD (computer aided design) software that

STOS CORNER

Frank Charlton fires up his steam-powered Internet relay and shows you how to extend yourself.

Extension help

With some help from a few friends I'm busy writing a new STOS extension, which I want to release into the public domain. We have about 80 new commands in the interpreter version of the extension, but we're starting to have problems with the compiler version. My friend's pen-pal told him that we couldn't have that many commands in the compiler extension, but didn't tell us why. What do we do?
Jeremy Caudle, Palmersville

Because of differences in the way STOS handles interpreter and compiler extensions you're limited to using 64 commands in a compiler version, even though you can

use up to 128 in each interpreter extension. For large extensions like the one you're writing, you need to follow the route used by the programmers of The Missing Link.

If you look at the way The Missing Link gets around the problem, you'll notice that it splits the extension into two separate files, each with 64 commands in. Effectively, you need to write two extensions. Actually, the registered version of The Missing Link needs three parts to hold all of the commands. Good luck with the extension, and I'd love to see it when it's done.

Internet connected!

I thought you might like to know that STOS programmers with access to the Internet can join a special mailing list to swap hints and tips, as well as find answers to difficult STOS questions. If anyone would like more information about the list, they can send

me an e-mail message at the address ma2ljig@midge.bath.ac.uk and I'll send them info about it.

Les Greenhalgh, Bath

Thanks, Les. If you use the Internet and want to keep in touch with the latest STOS news and developments, this is the thing for you. When you join the list, any messages sent to it are forwarded to your mailbox. Because everyone that reads it is a STOS user or programmer, you can guarantee that your query or tip will get an answer. You'll also find out where the latest STOS-related files are available for download. Les runs an excellent service, and best of all – it's free.

Incidentally, you can also contact me on the STOS mailing list, or send electronic mail directly to me at frank@theshack.demon.co.uk if you have any questions or feedback for the ST FORMAT STOS Corner. If you want

MUSIC AND MIDI

Andy Curtis boldly goes where many people have gone before. Crazy, but mostly coherent.

Cubase upgrade?

I have heard that there is a new version of Cubase out for the ST but I have received no notification about it from Steinberg. I am a little confused as to what is really going on so I would be grateful if you could sort it out for me. Thanks in advance.

Graham Dunwald, Essex

The latest version of Cubase is called Cubase Score and it has been out for a little while now. It is available either as a new package or as an upgrade to Cubase version 3. The add-on package costs £59 from Harmon Audio (0181 207 5050). The new score edit page is greatly enhanced with advanced score styling and printout facilities. There are also upgrades to the core program, including an arranger and some cosmetic changes. In short, if you are serious about score editing and printing then you will want to upgrade.

I'm going MAD...

At first it was merely a little irritating, then it began to annoy me. At present it is driving me mad. Please help. I use the Breakthru sequencer by Software Technology, and each time I load it, instead of going straight to the main screen, a large dialog box pops up telling me that I have used too much memory and that Software Technology produced the program.

I then have to click the mouse to get rid of it. I KNOW THESE THINGS ALREADY! Why do I have to have them rammed down my throat each time I load

the program? I pay shareware authors to have into screens like this removed. Is it too much to ask that a software company should not treat their customers like unregistered shareware users?

Influriated, Croydon

Whilst we can understand that this may be a feature that does not suit everyone, surely it is a small price to pay for the use of a wonderful program? Here are three ways to combat the problem:

1. Leave the sequencer running all the time so that you rarely have to launch the program.
2. Ask a friend or relative to launch Breakthru for you, thus sparing you the frustration.
3. Get a life.

Loop the loop

I use Cubase Lite and have found it to be a capable package. I miss a feature that I used to use in my old sequencer, however. The loop facility enabled me to make the drum part continuous so that I could try out ideas. There seems to be no facility to do this in Cubase Lite. Do I have to upgrade to Cubase, or am I missing something in the manual?

T R Devonshire, Dewsbury

Unfortunately there is not a conventional loop facility as such in Cubase. This actually applies to Cubase Lite as well as to Cubase itself. The easiest way to get round this is to use the Repeat function, which enables you to repeat a part as many times as you wish. Then you simply set the sequencer going and record away to your heart's content. Make sure that the part or parts are highlighted first and then select the Repeat command

from the Structure drop-down menu. All you have to do is enter the number of repeats desired and specify whether or not they are to be 'Ghost' parts. If you use 'Ghost' parts then any changes made to the original will affect all the repeated parts as well - handy if you are experimenting with different ideas.

Quantising hell

Having used a sequencer for some time now, I must confess that I still have not fully comprehended the full implications of the quantising process. Whenever I attempt to quantise a part it ends up sounding 'wrong' as opposed to 'correct'. How can I guard against this?

Bill Geddes, Durham

The most important thing to remember about the quantising process is that it can only do what you tell it to. It is not a magic wand that can reward recordist performances making them correct.

First you need to decide what the shortest note is in your part. This simple chart may help.

Chrotch = 4 beats to a bar = 3/4
 Quaver = 8 beats to a bar = 1/8
 Semi-quaver = 16 beats to a bar = 1/16

Now you need to select a quantise function that is the same as your shortest note. This will ensure that no notes are stacked on top of each other by the quantise. If most of your part is in quavers and crochets apart from a little flourish at the end then load the part into an Edit page and quantise the rest of it using an 8 value, but leave your clever bit intact. This can be highly effective and most sequencers support a feature like this.

outputs the specific commands needed to control the pens in a plotter. Normal ST art packages are not supplied with plotter drivers alongside their printer drivers. The only CAD program currently available for the ST is GFA Draft from GFA Data Media - give them a ring on 01734 794941 for the current price.

Atari PC monitor

I've been offered an Atari monitor for £20, model number PCM124. Will I be able to connect this monitor to my TImbyte STE?

Tony Friend, Malden, Essex

The monitor you've been offered is a 12-inch mono monitor for the Atari range of PC compatibles that they produced in the late 1980s. While the basic internal components of the PCM124 monitor are identical to the SM124 for the ST, the connections are different. The PCM124 has a PC-style 'D' connector instead of an Atari 13-pin DIN connector, which means that you can't plug it into your ST.

Take the monitor and your STE to a local computer or TV store along with your STE manual, and they will replace the PC with a 13-pin DIN plug using the pinout charts at the back of the manual.

No TOS disks

I've had my STFM for about four years and I want to do some printing with my Star LC-10 printer. The problem is that I haven't got my original TOS disks. Where can I get replacement disks?

G S Richmond, Walsley Island, Barrow-in-Furness

This isn't as big a problem as you think because you don't need the disks that come with an ST to do any printing. If you want to print anything from within a word processor, or any other program for that matter, you simply select the Star

LC-10 printer driver from within the program you are using.

Printing with your ST doesn't use any external software, because all the printer drivers that you're going to need are stored within your software and within the TOS ROMs inside your ST. So get your word processor loaded and get printing.

Monitoring the system

I have a TImbyte STFM and I am wondering if I can use my Tatung TM01 monitor with it. If I can use it, can I use it in high-resolution mode?

GE Cawdon, Balby, Doncaster

to know more about the Internet and what it is, check out our feature in ST FORMAT 65 - turn straight to page 85 if you missed it.

Yeah, but what is it?

I've just started using STOS and I've been reading in your column about things called extensions - can you tell me what they are, and give me a list of which extensions I can get?

Alan Keene, Bristol

An extension is literally what it sounds like - a way of extending STOS itself to give you more commands and features to use. Your copy of STOS should have one supplied with it, the Picture Coprocessor - check your manual for details on how to use it. Commercially released extensions are difficult to find now, but here's a list.

STOS Compiler: Turns your BASIC programs into faster machine code, and means you can produce standalone double-clickable programs which run from the Desktop. You really should try to get hold of a copy of this.

STOS Maestro: Comes in two versions. Maestro gives you the commands needed to use sampled sound and music in your programs, and Maestro Plus comes with a sampling cartridge so that you can make your own sounds.

STOS 3D: Provides you with commands to create and animate filled 3D vector graphics in your games. 3D is slightly slow and awkward, and never really took off with programmers although it's good for beginners.

As for PD and shareware extensions, you're spoilt for choice. We don't have enough space to go into each one in detail, but the those you should look out for are: Mity

The Missing Link, STOS Extra, STOS Tracker, STOS Control and the forthcoming Eagle extension, which looks promising - more next issue. Goodman have a great selection of STOS extensions, tutorial and example source files, call them on 01782 335650 or e-mail them at goodman@goody.co.uk.

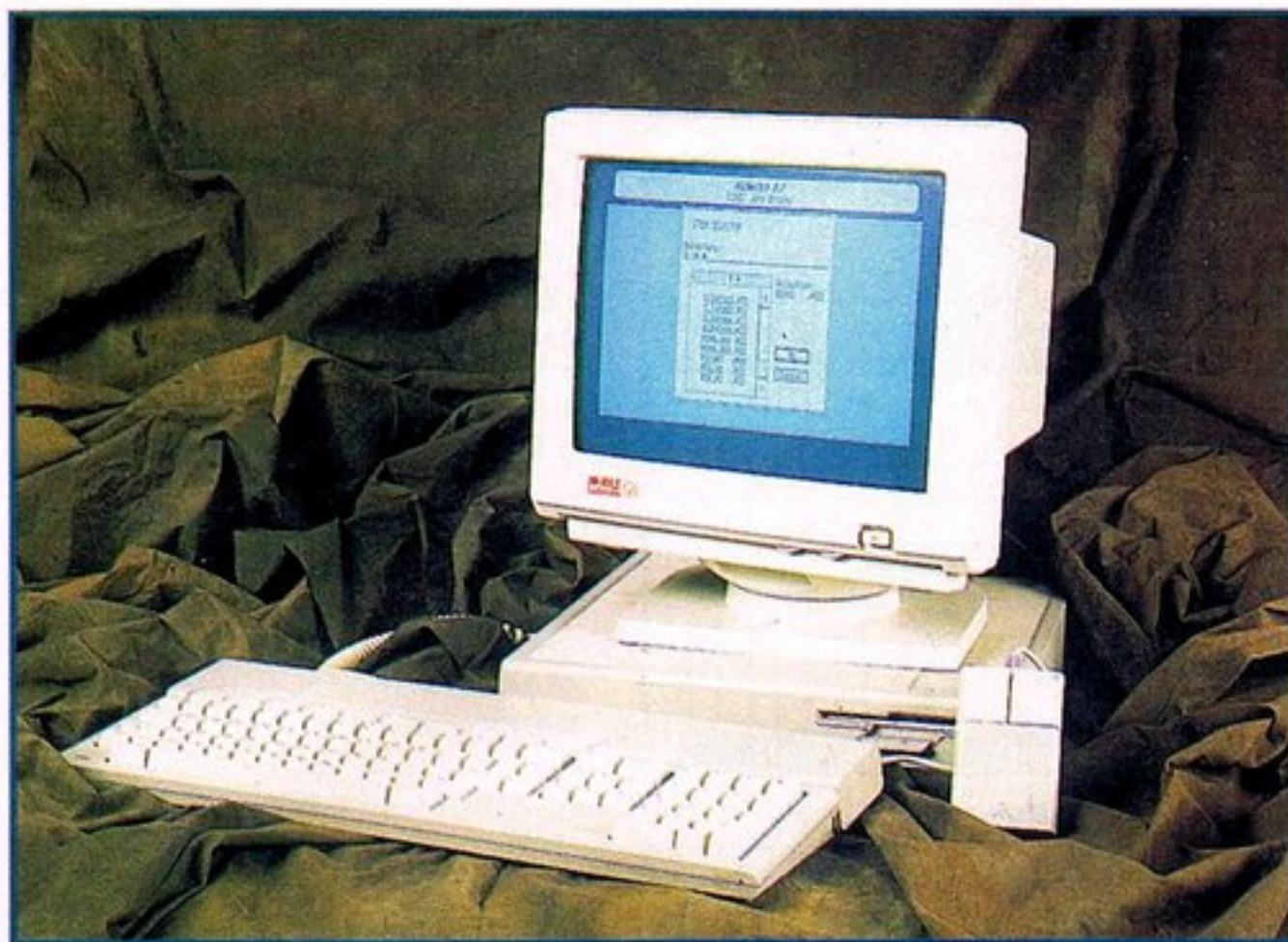
And finally...

Here's a little tip which came in through the Internet. STOS Missing List from Andrew Elman at ad-elmanster.york.ac.uk.

If you want to use the regular ST keylock instead of the STOS keylock, do the following.

click off + poke \$444.25

This is useful if you don't want your program to have that 'written in STOS' feeling.



■ All high-resolution monitors aren't the same, but the differences in picture quality are so small that it doesn't really matter which you choose.

A All the high-resolution monitors that you can get for the ST give you just about the same picture quality. Indeed, many of them are in fact the same monitors, except with different names and badges added by the distributor.

As a basic guide, try and get a 14-inch monitor with sound from your nearest supplier – you won't go far wrong if you do that.

Converting Calamus

SOFTWARE I have a MegaST4 with TOS 2.06 (Compo T-Board), Marpet XtraRAM +8, Megafire 60 hard drive, SM144 mono monitor and SLM804 laser. My problem is that I can convert Calamus to work with the XtraRAM +8 using the UseXtra program but the printer output no longer works after I've converted the program.

I'm also reluctant to convert other programs such as Redacteur 3, Calligrapher or Timeworks 2 because of the lengthy installation procedures I'd have to go through should

the conversions fail. Do you have a solution?

Brian McNulty, Bridlington

A Yes, I do have a solution for you. There's no need to convert Calamus to work with the XtraRAM +8 board, because it automatically works with the extra TT memory that the board provides. This is because Calamus was designed to work with the Atari TT030 as well as the ST.

Calamus uses an internal checksum routine to make sure that it hasn't been hacked by software pirates. When you use the UseXtra program to convert Calamus, the length of the Calamus program file is changed. The

internal checksum routine detects the change and automatically disables the program.

The easiest way to convert the rest of your software is to make duplicate copies of the

■ It's big and it's very clever. You can use the XtraRAM +8 board to take your ST up to 12MBytes of RAM, as long as you already have 4MBytes and TOS 2.06 inside your ST.

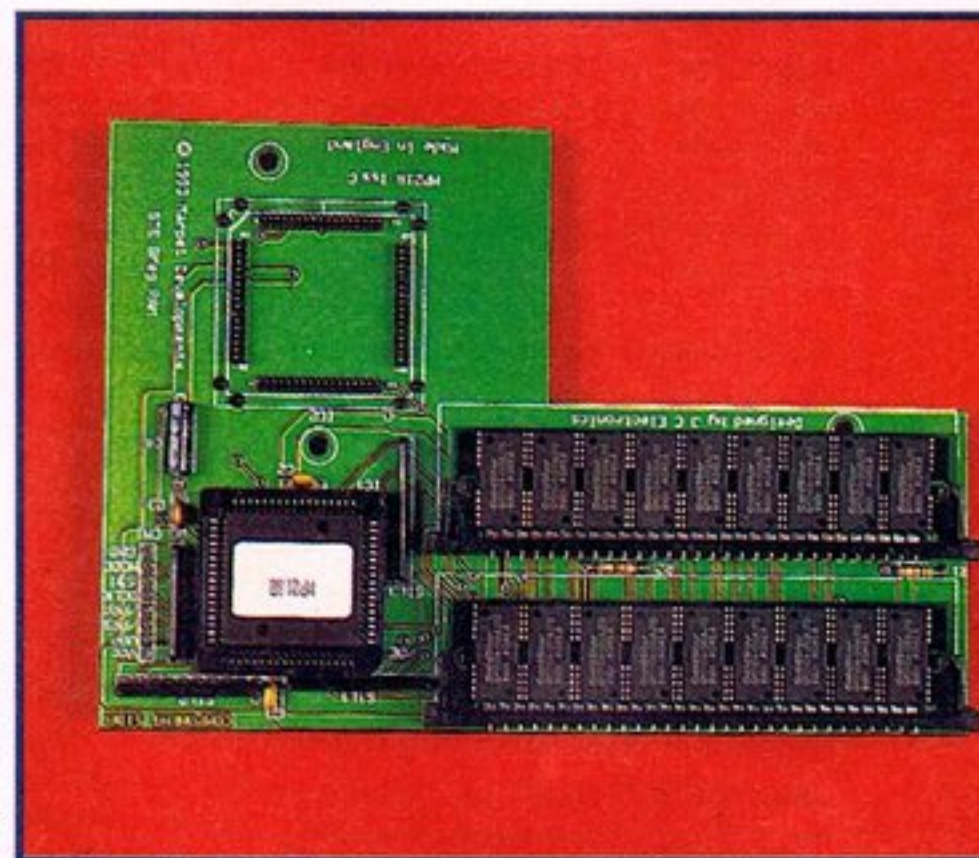
main program files, and keep the duplicates in the same directory as the original. You could make a copy of REDACT.PRG and call it REDACT8.PRG, then convert the copy with UseXtra. You should then be able to use the extra 8MBytes of RAM with all your main software. **stf**

Send your ST Answers questions, hints and tips to Clive either by e-mailing him at:

cparker@futurenet.co.uk or

clive@netmag.cityscape.co.uk

or post them directly to: ST Answers, ST FORMAT, 30 Monmouth Street, Bath, Avon, BA1 2BW.



STOS CORNER

Frank Charlton structures a few commands and reports on a new STOS Extension under development.

Stricter structures?

I've been playing around with STOS for some time now, because I find it easy to use for producing programs that use a lot of graphics and sound samples for my kids. I must admit I have some niggles with it.

I've written a few programs using GFA Basic, and I miss some of the more structured commands it provides. If I want my program to jump to a selection of subroutines depending on which key is pressed, do I really have to use a separate IF statement for every choice? In GFA I used to use the CASE and SELECT commands, which made my programs much easier to follow when I went back to them weeks later. Why can't STOS do anything like this?

Robin Mitchell, Guernsey

It's true, STOS wasn't designed with structured programming in mind. The CASE SELECT idea you mention makes your source code much more readable than using lots of IF statements, especially if you end up nesting them inside each other.

There is some good news though, Robin. Les Greenhalgh's STOS Control Extension, which is now at version 3.0, should be able to help you. It introduces 'switch constructs', which give you the power of using those two GFA Basic commands you miss so much. Control 3 is shareware, and registration is a mere five pounds. By now you should be able to pick it up from your usual PD library, and netsurfing STOSers can grab it from the ftp site at ftp.uni-kl.de in the pub/atari/programming/STOS directory.

And even if you aren't interested in these commands, Control 3 is chock-full of other stuff, from border removal on an STFM to lovely horizontal scrolling commands and routines that enable you to access those old four-player joystick adaptors, which you could use with games like Gauntlet 2. This extension is well worth a look, and Les promises even more in the future for those who register.

The eagle has landed

I thought you might like to see some details on my new STOS Extension, called Eagle. I'm still working on it, and it has over 80 commands including 15 or so MFP interrupt routines, which do stuff like animated mouse pointers, vertical scrolltexts and wrapping screens around tubes – all under interrupt. Eagle should be finished shortly, and I'll send a copy as soon as it's ready.

David Haylett, Leicester

Cheers, David – the list of commands you sent looks awesome. I'll make sure it gets the exposure it needs when it's ready to be unleashed.

If anyone else has written Extensions or routines for STOS, which they'd like to share with the world, then please do send them in on disk. As well as giving BBS users the chance to see them, I can make sure that they're placed on the Internet site I mentioned in the previous answer, so that STOS peeps all over the globe can get at them. If they're really good, you may even get to see them on the ST FORMAT Cover Disk – who knows?

AMOS or not to AMOS?

A friend at school keeps harping on about AMOS. He tells me how great it is, and that it's much better than

STOS. I know he has an Amiga, and I think it's just STOS for his machine – is that right? Can I get it for my STE? Can we swap programs we've written to get them to work on each other's machines?

Colin McHugh, Isle of Man

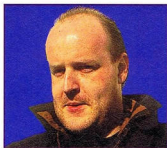
You're right, Colin – AMOS is the Commodore Amiga version of STOS. AMOS was written after the ST version, and has gone through a few more versions than STOS. Since the Amiga and the ST are quite different, you could possibly convert your work to the Amiga, but transforming your friend's stuff for use on the ST could be difficult.

The Amiga has some custom chips inside, which perform graphics and sound functions, and AMOS offers commands to access these chips. Porting your program would mean that you'd have to remove any of these hardware commands and write STOS routines to perform the same job. I'm not saying it's impossible, just don't expect it to be easy.

Your friend needs to pick up an Amiga program like MessySID or CrossDOS to be able to save his files to PC formatted disks, which you can then read directly in your ST drive. Tell him to check out his favourite Amiga PD library, and good luck with the task ahead!

E-mail

You can e-mail your STOS queries directly to Frank Charlton at: **frank@theshack.demon.co.uk**



STOS Corner returns in style this month, with more space and more news. Frank Charlton dons his special STOS TechnoTrousers once again.

STOS Corner

NO MORE DISKS!

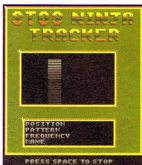
Q I'm in desperate need of a STOS file called BASICM.H.PRG, because I've heard that it will be able to run the upgraded version of STOS with the compiler on my STE. I think this was on STF Cover Disk 41. I have enclosed a disk and a self-addressed envelope so you can just easily add the file for me.

Simon Chu, Hamilton

A As I've said before, we can't deal with personal letters, and we certainly haven't got time to copy disks and send them back. If you've missed a Cover Disk you should check out the Back Issues section on page 76, or failing that, try placing a free wanted ad (see page 72). The fix you describe will update your copy of STOS to run on your STE, and if you contact your usual PD library they'll be able to sell it to you. Goodman PDL have an great STOS collection – call them on 01782 335650 for details.

TRACKING THE STE

Q Has anyone written anything to play tracker modules on the STE using STOS, because the STE can play them without any slowdown. If there isn't one, can somebody out



Les Greenhalgh's MOD player – coming soon to an ST near you!

there please write one!
James Marson, Rotherham

A Yep, Ye Olde STOS Tracker is a bit outdated, isn't it? Les Greenhalgh, who runs the STOS Mailing List, is currently toying away finishing his adapted STOS Extension which uses the Ninja MOD replay routines to work with STOS.

I've seen an early beta version of the interpreter Extension, and very tasty it is too! Unlike STOS Tracker, you just use the normal MOD format without any fiddly conversion first, and the sound quality is a lot better. As soon as Les decides it's ready to release, we'll let you know.

SMEAR CAMPAIGN

Q I've been trying to place a stationary sprite against a scrolling background, but the sprite leaves a trail on the background. Adding a WAIT 2 statement stops the smear, but causes the sprite to flicker.

M Y K Hilton, Manchester

A First, if you're still using the built-in STOS sprite routines, you really should take a look at STOS Extensions like Misty and The Missing Link. I've mentioned them several times already and with good reason – the sprite routines in The Missing Link are excellent.

Check your local PD sources for a copy. Looking through the snippet of code you sent in, you're completely missing the WAIT VBL command. Because a TV picture is built up from scanlines drawn by the electron gun, if you move your sprite or background while the screen is only half drawn, you'll see it flicker. Add a WAIT VBL command just before you use SCREEN SWAP to switch between the hidden work screen and the physical one, and you'll lose the flicker. WAIT VBL waits until the electron gun is ready to start drawing a new screen. TV images are updated 50 times a second, so you can see how quick STOS can be!

LOAD OF OLD TOS?

Q I've just written a demo in STOS and I want to give it to my friends, but some of them have different versions of TOS to me. I have an STE, but one of my mates has an old STFM, and his cousin has a Falcon. I've tried the various STOSFIX programs, but they don't seem to work.

Derek Smalls, Luton

A The STOSFIX programs work by modifying the compiled STOS program to work with other versions of TOS. Your best bet is to pass your compiled demo to your friends along with STOS Fix 3, which we gave away on Cover Disk 67. Your friends can then use STOS Fix to fix your program to run on their specific version of TOS – although an STFM should run it without any changes at all. sfj



STOS Fix performs surgery on your masterwork so that other ST peeps can enjoy it too.

CASTING THE NET

Since I mentioned the STOS Mailing List on the Internet a few issues ago we've seen a healthy influx of new STOS users there. There's a fair amount of STOS activity on the Net, and it's a good source of info too – but don't worry if you're not on-line yet, because I'll be bringing you all the news from the cyberstaring STOSers over the next few months.

Mark Westguard is busy updating his STOS-written BBS Directory to

include a terminal program, so you can nip off for a quick logon to the BBSs in the database.

However, when it comes to getting transfer protocols like ZModem to work from within STOS

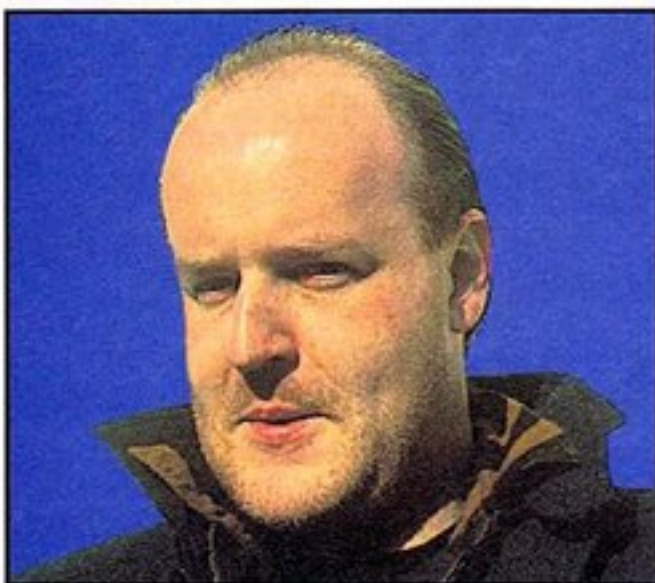
he's having problems. If you've programmed comms stuff in STOS, or have any technical details about ftp, please get in touch and I'll pass the info on to Mark.



The STOS Mailing List regularly updates this list of Frequently Asked Questions (FAQs) about STOS.

If you're on-line, you can contact Frank at the following addresses:

Internet:
frank@tachyon.demon.co.uk
NeST 90:100/308.2
AtariNet 51:6/208.2
FidoNet 2:256/502.28



Having recovered from the shock of having Clive's wallet fall on him last month, Frank Charlton bounces back to deal with your STOS problems.

STOS Corner

THAT'S MAGIC!

Q I don't have my ST any more because I couldn't afford the repairs when it died. My brother has an Apple Mac, and I've heard about using this new MagicMac to run ST software. Do

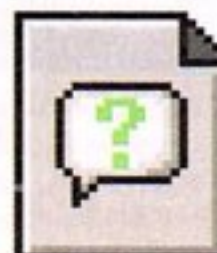
you think STOS will run on it so I can carry on with writing games?
Billy Smithwick, Cheshunt

A I very much doubt it. MagicMac is a wonderful piece of programming, but it's not a miracle. STOS does not even behave very well under MagiC on the ST. We did try using STOS under MagiC, and although it seems to work at first, it throws a wobbler as soon as you try a simple command

We gave you the BBS Directory on Cover Disk 68. Now take a look at routines used in the future version.

MagicMac will run well-behaved ST software on a Mac... Unfortunately STOS isn't all that well-behaved.

like printing to the screen! It isn't the fault of MagiC or MagicMac at all, it's just that STOS itself doesn't obey the ST programming rules correctly. That's why there are STOS fixes for each new TOS version. Only correctly written GEM programs will work under MagicMac, which leaves STOS right out of the running. Sorry about that.



If you're on-line, you can contact Frank at the following addresses:
frank@tachyon.demon.co.uk
NeST 90:100/308.2
AtariNet 51:6/208.2
FidoNet 2:256/502.28
Or write to the address on page 52.



ANY PORT IN A STORM

I mentioned Mark Westguard's BBS Directory last month, and the trials of controlling the serial port from within STOS. Mark was kind enough to send me the routines he's using to configure the port. These aren't using any STOS-specific commands, but use the TRAP and POKE statements to access routines held within TOS itself. Be careful about fiddling with these, as careless use of TRAP commands can crash your ST. Make sure you save your work before you run it!

First, set the speed at which the serial port operates - the baud rate. We've created a variable called BAUD, and given it the value we need as follows:

Baud rate	Value	Baud rate	Value
19200	0	1200	7
9600	1	600	8
4800	2	300	9
2400	4		

Then use the command:

```
trap 14,15,BAUD,-1,-1,-1,-1,-1
```

Flow control is the way your ST tells a modem to hold back for a while, until it clears its buffer. For speeds of 9,600 and above, flow control of some sort is essential to prevent errors. In the same way as BAUD, use a variable called FLOW, and set the value as follows:

Method	Value	Method	Value
None	0	RTS/CTS	2
XON/XOFF	1	Both	3

Then use the following TRAP command:

```
trap 14,15,-1,FLOW,-1,-1,-1,-1
```

For the next few parts, just remember, 99 per cent of BBS systems are configured to use a system known as 8-N-1, which means 8 databits, no parity, 1 stopbit. This defines the way data is sent over the modem link. Starting with databits, use a variable called DATL

Databits	Value	Databits	Value
8bits	0	6bits	2
7bits	1	5bits	3

Then, do the following:

```
OUSART=peek($FFFA29)
```

which stores the old port register in the variable USART.

```
NDATL=DATL*32
```

```
USART=(OUSART&%10011111)+NDATL
```

These shift the data to bits 5 and 6, and mask and replace the original value with the new one.

Finally, the command: poke \$FFFA29,USART does the job.

Setting Parity is very similar. Use the variable PARITY as follows:

Parity	Value
Off	0
On	1
Odd Parity	2
Even Parity	3

The code looks like this:

```
OUSART=peek($FFFA29)
NPARITY=PARITY*2
USART=(OUSART&%11111001)+NPARITY
poke $FFFA29,USART
```

Again, stopbits is similar, this time using a variable called STB:

Stopbits	Value
1 Bit	1
1.5 Bits	2
2 Bits	3

The code:

```
OUSART=peek($FFFA29)
NSTB=STB*8
USART=(OUSART&%11100111)+NSTB
poke $FFFA29,USART
```

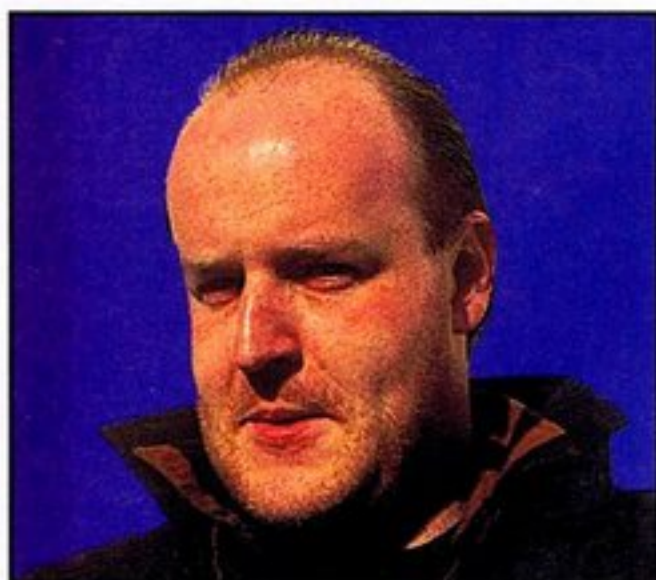
Now, if you're wondering why we used sensible names like PARITY for some variables and cryptic ones such as STB for others, remember that your variable names mustn't clash with in-built STOS commands. So, if we'd used STOPBITS instead of STB, the command:

```
STOPBITS=3
```

is be read by STOS as:

```
STOP bits=3
```

This would halt the program and cause terrible problems. Always check your variable names against STOS keywords very carefully. stf



Mild-mannered Frank Charlton once again slips into his Captain STOS alter-ego in an attempt to stamp out programming injustice, and to answer this month's batch of reader questions.

STOS Corner

GARBAGE, MA'AM?

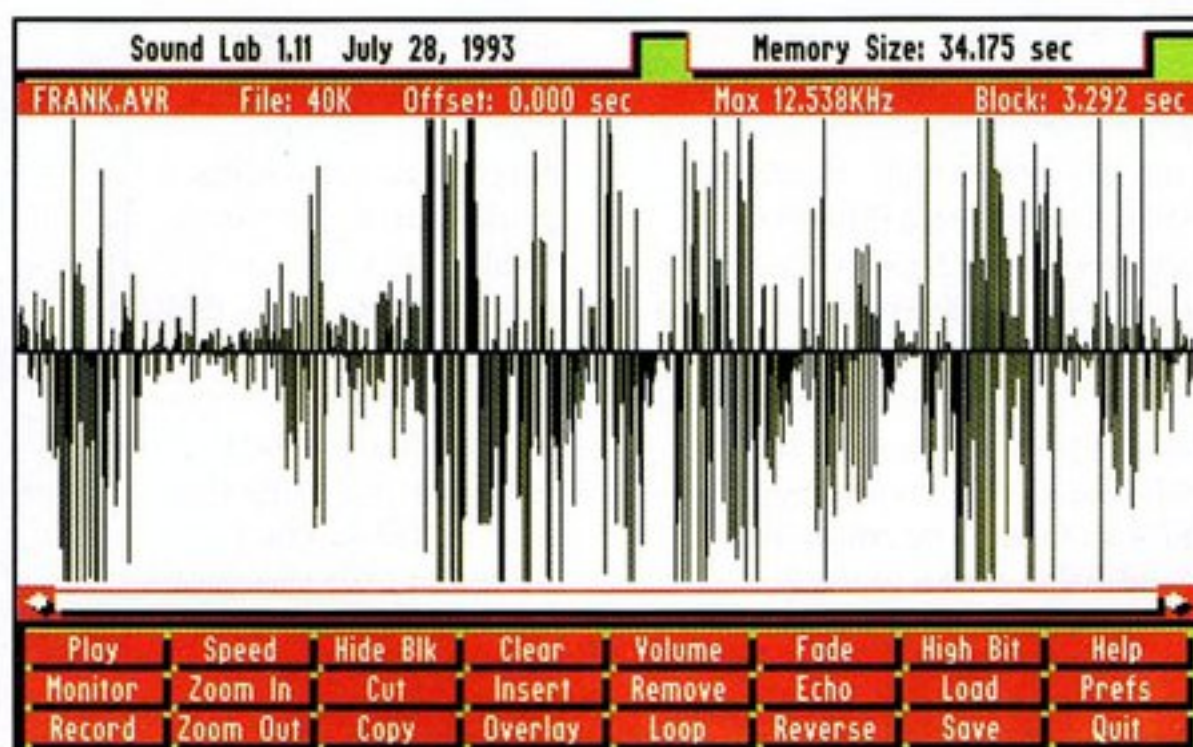
Q I've been working on a role-playing adventure game for a while now, and I'll admit the code is getting a little spaghetti-like. It's grown out of all proportion, and now when I run it there's an annoying pause before my combat routines kick in. I've been right through, and it's driving me mad. Where did this pause come from?

Russ Piper, Camberwell

A Russ, 'a little spaghetti-like' is the understatement of the year. Obviously as the program has evolved you've dropped the use of some variables and introduced others – but on the way you left a lot of redundant ones in there. Some of your routines are initialising and working with these variables, but they're not actually being used by anything. When the memory occupied by variables is used up, STOS does a 'garbage collection.' With as many variables as you have, this causes the pause. You can control this by forcing the garbage collect routines at a point where the pause won't be noticed. Using a dummy variable (yes, I know you have about 30 already!) and issuing the command `dummy_variable = free` will force the garbage collect. Better still, take a long hard look at your code and strip all of that redundancy out. It takes time, but it's worth it. Secondly, considering the size of your work, you really should intersperse it with comments. Use REM statements to identify key subroutines – it makes life a lot simpler when you have to do a major revision like this.

BANKING ON IT

Q I found a little machine code program on an old PD disk to use within STOS programs, but I can't get it to load. The section from my game looks like this:



SoundLab will swallow almost any sample format without hassle. What's more, we gave it away on issue 69's Cover Disk. We're too good to you, we really are.

`reserve as work, 6000`
`load "RAINBOW.PRG", 7`
 What am I doing wrong?
 Jesse Morris, Texas

A It's a simple mistake, Jesse. In the case of little machine code modules, you don't actually need to reserve the bank first – STOS does it for you. Just remove the first line in your example, and the second line should do the trick for you. Just CALL the routine as normal and all should be well.

SOUND ADVICE

Q I've just got a second-hand STE to replace of my battered old STFM, and I'm interested in using samples with the STE's DMA using either STOS Maestro or the STE Extension. When I called my local BBS they had a lot of samples, but none of them were in the STOS Maestro format. Most were in files with extensions like WAV, AVR and VOC, so how can I use them?

Jill Armstrong, Sussex

Firstly, Jill – STOS Maestro doesn't play samples through the DMA. The STE Extension does though (it

wouldn't be very STE otherwise) and you can easily convert the samples. We gave you an excellent sample manipulator on ST FORMAT Cover Disk 69, called SoundLab. This attempts to load anything you throw at it, and succeeds in most cases. We've tried it with all of the formats you mention, and with the exception of the occasional VOC sample it works perfectly. Check the BBS you mentioned for a sample converter called

SOX5, although it's a non-GEM TTP program, it converts VOC samples easily for you.

DREAM ON

Q I read that a disassembler can convert machine code programs back to the assembly source code – has anyone written something which will convert a compiled STOS program back to a STOS Basic listing?

Michael Hunt, Thornaby

A No. Since the compiler converts a STOS listing into machine code, and doesn't leave any of the STOS Basic code at all, this is an impossible task. If you knew assembly you could disassemble a compiled STOS program, but it would produce an assembly listing, not a STOS one. If you're good enough to navigate assembly language like that, there's little that someone else's STOS program could teach you. If, however, you want to recreate the source code of one of your STOS programs, you've learned a valuable lesson. Always keep a backup of your original source code in case something happens to it.

HOME AND ARRAY

Finally this month, a gem of a tip from Les Greenhalgh that came in via the STOS Mailing List on the Internet. Les reckons that this can be as much as 40% faster than the usual methods, and that's even after it's been compiled. So, the next time you want to copy two arrays, just try the following routine:

```
dim a(n), b(n)
copy varptr(a(0)), varptr
(a(0))+n*4 to varptr
(b(0))
```

Try it. It's ultra-fast. Compare it with this old chestnut:

```
for x=1 to n
  b(x)=a(x)
next x
```

When you want to initialise an array use:

```
fill varptr(a(0)) to
varptr(a(0))+n*4, 0
which fills it with the value 0.
```

You can contact Frank Charlton at the main ST Answers address (page 52) or if you've got on-line access, then you can contact him at the following locations:
 frank@tachyon.demon.co.uk
 NeST 90:100/308.2
 AtariNet 51:6/208.2
 FidoNet 2:256/502.28

STOS tutorial

Assembly-quality games with the ease of STOS? You better believe it! Professional programmer Tony Greenwood shows you the speed and animation tricks that made *HERO* (STF 64, 85%) a success.

When it comes to speed, it's all a matter of getting your ST to do as much work as possible in the shortest period of time. That sounds obvious, but in order to do it you need to find a range of commands, routines and tricks that enable you to get the best from STOS. By far the greatest time-saving trick involves 'pre-shifting'.

The problem with the way the ST displays the screen is that it uses a series of strips 16 pixels

wide. Sprites can only be placed in x positions marked by this grid. You can't, for instance, display a sprite at the x position 19 – you have to modify it by shifting the image three pixels to the left and display it at position 16. This is called pre-shifting, because you shift the sprite image left or right prior to displaying it.

Cleverly, STOS takes care of pre-shifting for you in real-time, but this has obvious drawbacks when it comes to speed – it only takes ten or so sprites in motion

for STOS to spend all its time pre-shifting, causing your game to slow down in direct proportion to the amount of information you have to display. The drop in speed isn't constant, though, causing an ugly lag every time you move too many of your sprites.

The solution is

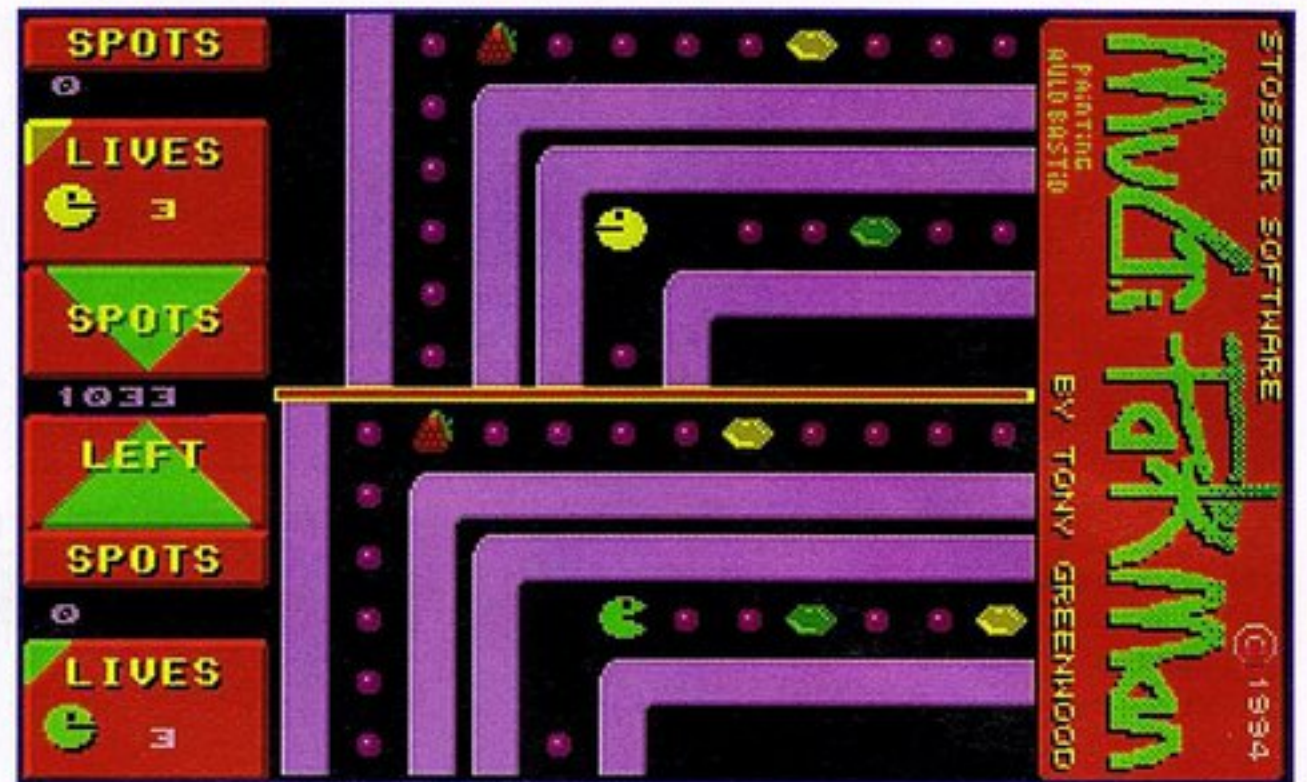


The STOS sprite editor has stood the test of time. It is still needed today for designing BOBs and other background blocks.

THE MUST-HAVE EXTENSION

STOS Basic has been added to on a regular basis over the years, and more upgrades are in the pipeline as we speak. Of the extensions currently available the most notable – and the one no STOS programmer should be without – is *Missing Link* by Top Notch Software. If you haven't already got it, skip along to Back Issues (page 77) and order ST FORMAT 51 – you'll find the PD version on the Cover Disk. Alternatively, you can go the whole way and purchase the full shareware version from Goodman International (☎ 01782 335650).

Top Notch Software dragged STOS into the future with their *Missing Link* extension – we love 'em, we do.



Pakman features split-screen smooth multi-scrolling maps, touch sensitive joystick control, superfast gameplay and exceptional sound quality – all in STOS Basic.

STOS MYTHS

STOS is slow

No, STOS used to be slow before being upgraded.

STOS is jerky

The sprites are but we've just replaced them with BOBs.

STOS is unresponsive

Not any more – see above.

STOS does not support GEM

So what?

STOS is no longer supported

Not by Mandarin, sure, but we know of no other language on the ST that is upgraded at the same rate as STOS. Also, independent upgraders have a better understanding of the needs of STOS users.

STOS is incompatible?

Wrong – as STOS can now be fixed to work with just about any TOS version. Nothing in this world can be guaranteed to be future compatible.

Animation

So let's get straight on with animating these BOBs. For a simple left and right movement you need three new variables – let's call them B_R and B_L for the direc-

tions and IMG for the image. Your STOS sprites are numbered starting from 1, whereas BOBs are numbered from 0, but this is taken care

You need to find a range of commands, routines and tricks to get the best from STOS

advance planning. As the programmer, you know in advance how your sprites are going to move (and how much they need to be shifted), so why not do it before the game starts, saving enormous amounts of vital processor time when it's most needed during the game?

To be honest, the STOS sprite routines won't help all that much – they're slow, and don't give you or the player enough control over the display. A better system can be found in the *Missing Link* extension, using BOBs instead of sprites.

of when you convert your sprites into BOBs using the extension.

A bank of 12 BOBs (the first six being the left animations and the remaining six for the right movements) would be numbered B_L=0 and B_R=6. Your actual BOB command asks for the image as one of its parameters, so use the variable IMG for this. To place your BOBs in bank 6 and then show the first image at the current X, Y co-ordinates you need the command:

```
BOB LOGIC, START(6), IMG, X
Y, 0 (all one line)
```

Having done that, you could then increase the appropriate variable and assign IMG to it whenever joystick movement was detected. So the left movement with an overflow error check would look



The STOSSer diskzine: "No, I think we'll go with plan B - make it look as far removed from a programming language as possible."

like this:

```
IF JLEFT THEN INC B_L :
IMG=B_L : IF B_L>5 THEN
B_L=0 : IMG = B_L (one line)
```

When STOS runs out of left animations (that is, it reaches 6) it restarts at animation 0.

Set animations, such as climbing a wall, can be achieved by making a loop that is governed by the number of animation frames needed. You then retrieve the correct animation numbers from a line of DATA. This is one of the tricks used in *HERO* - although I had over 250 frames of animation to work with, some frames were used more than once for different effects. With the LOOP/DATA trick the animations don't have to be stored in sequential order and the DATA line enables you to mix and match frames from different animations to create new ones.

Jim never moved!

The biggest illusion created in *HERO* (and, indeed, in many other

EXTRA READING

More information on STOS can be found in the longest running STOS saga of all time - the ST Answers STOS section currently under the vice-like grip of Frank Charlton.

Alternatively, the STOSSer diskzine, currently at issue 23, is packed to the brim with articles, tutorials and all manner of STOS-related documents, plus plen-

ty of source code with every issue. To get hold of a copy, simply send a disk and SAE to B Goodfellow, 2a Colvin Street, Dunbar, East Lothian, EH42 1HE.

The *Beginners Guide to STOS* can be found for as little as £15.00 if you shop around the PD libraries. As the title suggests, it is perfect for the new user. However, the package does not include *STOS Basic*.



Jumping, climbing or just hanging about, Jim never strays from the centre of the *HERO* screen - so he never needs pre-shifting.

commercial games) is to make the player believe the main character moves, even though he never strays from the centre of the screen. If you hold your finger over the screen where Jim appears, then play, he never leaves the end of your finger! It's only the background that moves, the obvious advantage being that unlike the BOBs used for baddies, you don't have to use pre-shifted versions of every frame of Jim's animation, because he never changes his x position anyway.

If you've got the *Missing Link*

extension, you have commands at your disposal that allow you to design large areas to be used as scrolling back-grounds. As these are made up of 16x16 pixel blocks that started out as sprites, you can apply the pre-shifting method to a screen full of sprites, giving the game's scenery

smooth multi-directional scrolling.

The size of the map created does not affect the speed - a 640x480 map will be displayed, scrolled or updated at the same rate as a 1280x960 map, but the amount of the map you show on the screen at any one time can have varying effects...

A square map of any size will give you a smoother effect than any oblong map as the ST has the same amount of work to do no matter what direction you scroll. A displayed map that takes up the full width of the screen should be avoided unless you only intend to scroll horizontally. For optimum effect the largest map displayed on your 320x200 screen should be no more than 200x200 pixels.

There is an undocumented limit of 128 16x16 blocks that can be used in the creation of your map, but there are other uses for the blocks beside drawing scenery. In *HERO*, the starting position of both Jim and the baddies are different for every level (an important aspect of any platform game). This was achieved using dummy world blocks. When a map is loaded the

X, Y BLOCK command is used to find the positions of the dummy blocks, which are stored in an array to be used as the baddie starting positions. The REPLACE RANGE command is then used to place more usable blocks into their vacated slots.

Constant loops

As we've discussed earlier, the game's speed has to be constant. If the whole thing speeds up or slows down every time you place or remove moving sprites, you won't impress anyone. If your first level contains only one baddie, but the fourth level contains 20, the drop in speed will be as noticeable. You can combat this problem by consistent programming.

The first level, with its one baddie, should still have the routine drawing the other 19. The player will never see them and your routine will not detect them, but the program will run at the same speed because it is still drawing them (you can draw them to a part of the map that is not being used, or to a dummy screen). Because you have to draw the baddies anyway, you can animate them dying or leave them burning.

Next month we'll be covering sound and gameplay techniques - see you then. *stf*



HERO: "I'm so depressed. You go on without me. I'll just wait here with my sandwiches."

TEN TO GO...

Here are ten things you can get rid of:

GET RID OF	REPLACE WITH	EXTENSION
Sprites	BOBs	Missing Link
CLS	WIPE LOGIC	Missing Link
SCREENCOPY	BLIT	Missing Link
PRINT	TEXT	Missing Link
HIDE/SHOW	MOUSE OFF/ON	Misty
SCREENS	QUICK SCREENS	Control
APPEAR	FADE IN/OUT	
Mouse pointer	A tasteful one	Design your own
STOS music	CHIP/ABK	
INKEYS	HARDKEY	

SPEEDING UP STOS

- Use a variable rather than the actual address of a bank, such as:
S6=start(6)
S6 will hold the address of bank number 6 and your computer doesn't have to work it out every time.
- The fastest loop you can use is a FOR/NEXT command. It's even faster if you don't include the variable after the NEXT.
- Accessing a normal variable is faster than accessing a dimensioned array, so using:
A=1:A1=19:A2=7
will give you a faster routine than using:
DIM A(2)

- and assigning the numbers to the array elements.
- The fastest way to move a whole screen about is to use the FASTCOPY command (from the MISTY extension), using variables for the addresses. For example:
FASTCOPY S6, LOGIC.
- Turn AUTOBACK off just before your routine starts, as it's both useless and time consuming. On more complex routines the speed difference will be visible to the naked eye. Changing modes or using CLS will turn it back on.
- Using the INC command is a faster way to increase a variable's contents by one than $x=x+1$. Two successive INC commands are faster than $x=x+2$.



Still under the vice-like grip of Frank Charlton, this month's **STOS Corner** features great graphics, dynamic data transfer and excellent extensions.

STOS Corner

JUST A MEMORY

Q I have a program which loads some picture files to disk as it runs. When I compile it to GEM so it runs from the Desktop, the Compiler includes the picture files into the compiled program. I want to stop this, as I want my compiled program to load them from disk, just like the interpreted version. How can I do this?

Lee Ashmore, Thetford



The STOS Compiler is good, but be very careful that you're not compiling more than you need to.

A Lee, this might sound daft, but the answer is simple – don't run your program before you compile it.

When you run programs from within STOS, the Interpreter will reserve the memory banks you have requested, and load the files. If you quit the program and go to compile it, those banks are still reserved, and your picture files are still in memory, so the Compiler includes them.

Once you're sure your program is working as you want it to, save it to disk as usual, type NEW to clear your listing, and load it from disk again. Don't type RUN, just start the Compiler and off you go.

COMMUNICATION

Q Which is better for data transmission between two to four computers? A modem cable or MIDI leads?

Andrew Robertson, Strathclyde

A It depends what you want to do. If you're planning a multi-player game like MIDIMaze which uses a separate ST for each player, then the MIDI cables are your best bet. Using the serial port with a null-modem cable will mean you can only connect two STs together. Since the MIDI ports have both in and out, and are designed for linking more than two devices, you can link up quite a few machines. On a standard ST, the serial port can only go as fast as 19,200bps, but MIDI can transmit and receive at over 31,000bps, so your game will spend less time waiting for data. Let us know how you get on with your multi-player game, we love 'em to bits here at ST FORMAT.

HAPPY HAPPY JOY!

Q Is there any way to read the PowerPad controllers which come with the Atari Jaguar from within STOS? By using the STE Extension command I have had some success, but it really isn't perfect.

James Marsson, Maltby

A When the STE Extension was written, there wasn't really anything you could plug into the STE's enhanced joystick ports, so it's no big surprise the rou-

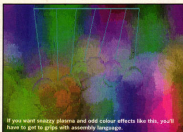
tine isn't perfect. Fortunately, Les Greenhalgh – the author of the excellent STOS Control Extension – has written a routine to read the PowerPads in your game. He's making it available to registered users of STOS Control, which is well worth the money even without this bonus. If you haven't got STOS Control, check your favourite PD Library and get your cheque off.

THE PLASMATICS

Q I have a lot of demos and I'm very impressed with the 'plasma' screen effects. How can I create one for a STOS demo I'm writing?

Nick Lemon, Cardiff

A Nick, the demos you've seen are almost always written in assembly language. Even the ones which claim to be fully written in STOS usually have a bit of assembler tucked away somewhere. However good STOS is, it simply isn't up to the



If you want crazy plasma and odd colour effects like this, you'll have to get to grips with assembly language.

like this you'll have to tackle some assembly language programming yourself, and creating a plasma effect would take a lot of learning – demo programmers eat, sleep and breathe with their ST to come up with impressive effects like that.

TOP NOTCH!

Q Did Top Notch Software release any extensions after The Missing Link? Is it still going? Can I still register The Missing Link if Top Notch has disappeared?

Alan George, Nottingham

A As far as we know, The Missing Link was the last extension written by Billy and Colin. They were always difficult to get hold of, so Goodson Enterprises (01782 335650) took over registration of The Missing Link.

For more on STOS programming, see the tutorial on page 66.



The STE and Falcon can take advantage of the Jaguar's controllers, too. Zero-5 can do it, and so can you...

Write to: STOS Corner, ST FORMAT, Future Publishing, 30 Monmouth St, Bath, Avon BA1 2BW or e-mail Frank at: frank@tachyon.demon.co.uk, or stformat@ciix.computlink.co.uk, or Frank.Charlton@adlib.centron.com.

STOS tutorial

Following on from last month's introduction to STOS animation, game programmer Tony Greenwood shows you how to detect collisions... and organise some sound effects to go with them.

An important part of programming is your choice of music and sound effects. STOS has its own music accessory and built-in music commands but, as with the STOS sound effects, these are not up to today's game making standards. Fortunately, there are various alternatives.

Music

Chip music is by far the most versatile as it plays on interrupt and takes up very little memory. Any PD library will supply you with disks full of titles. Playing the music is simple: just use the 'Musauto' command from The Missing Link extension.

MOD files can also be played, but only by using a PD machine code program that leaves you with no processor time at all. This is therefore only useful for static screens such as your game intro or high score table.

STE owners can now play MODs in the background using the new STE Tracker extension,



A scene from STOSer diskline - see issue 71, page 66 for more information.

available from your local PD library. There is a tracker extension for STFM owners as well, but this involves converting your MOD into an ABK file with the software

provided. Some sound quality is lost in the process but it does at least enable you to play a MOD file and still have a

little processor time left for your game's intro routine.

Sound effects

Sound effects do bring your game to life, and need not take up large amounts of processor time. Investigate your chip music files, as various sounds are often

You could advertise for someone owning a sampling cartridge to be your sound man

included. For example, if you use a value higher than one as the tune number in *Killing*, as by Count Zero you will find 20 sound effects and three tunes.

However, SAMple files are the most popular. Used in conjunction with a sampling cartridge they give you full control over the type, size, quality and speed of the sound effect best suited to your needs. You can obtain disks full of SAM files from your preferred PD library, or you could advertise for someone owning a cartridge to be your sound man.

However, SAMpled sounds do take up processor time - the higher the sample rate the better the quality, but more processor time is needed to play it. For a short Sample such as a gun shot or footstep you can use the minimum 3kHz and still retain clarity. The processor time used with this rate is minimal. The STOS Maestro 'Samplay' command has a 5kHz minimum playback frequency, while The Missing Link 'Digplay' has a 3kHz minimum and uses less processor time on equal kHz.

When using any music or samples from the public domain you must always read any of the accompanying README files to ensure that copyright is not retained by any other parties. If you recognise a tune, or a sample sounds familiar, then don't use it.

EXTENSIONS

Extensions are updates to STOS and so far I have made numerous references to The Missing Link (available from Goodman International, ☎ 01782 335650). For game-makers this is the most powerful extension and replaces many of the original STOS commands, as well as introducing its own routines.

Game-making is not, however, the only task to which it is suited. The recently released commercial package Video Supreme (£29.95, Goodman International, as above) is coded in STOS Basic. It uses this extension to great effect to enhance the audio and visual aspects of the program.

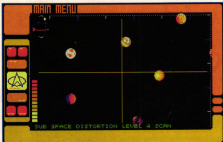
STOS Basic is used to make a wide variety of programs. Educational programs, applications, and serious software are there for all to see in the public domain and commercial arenas.



See, you really can do anything with STOS extensions!



STOS Basic is used here to help modern owners access the Net.



Warp disk magazine (STF 70, 92%) features clear SAMpled sound at 3kHz.



STOS EXTENSIONS LIST

TITLE	COMMANDS	RATING
3D	Full 3D studio package	***
Compiler	Compile your STOS.BAS files	*****
Compact	Pack/unpack picture files	*****
Control	Games/serious	***
Cyber	Run CYBER.BEQ files	***
EXTRA4v2.10	Serious, 50+ commands	*****
Extract	Pack/unpack IMG files	**
GBP	Various commands	*
Joystick	Allows twin joysticks	*
Maestro	Samples player/manipulator	*****
MIDI	MIDI manipulation	**
Misty	Demos/games/serious	*****
Missing Link	Games/serious	*****
No Border 2.1	Remove top/bottom borders	*
Quick	Various games/serious	**
Squash	Pack/unpack STOS files	*
Stars	Create STAR fields	*****
STE Blitter	STE blitter chip controller	*****
STE	STE sound/ports/colour etc	*****
STEEXT	STE sounds	*
STE Tracker	STE MOD player	*****
Tracker	STFM MOD player	****
TOME21	Game map creator	*
Useful	Varied commands	*
VIDI	Use with VIDI grabber	*****

Crash bang wallop!

Collision detection is more than

just checking to see if two sprites collide. You must use a routine that is versatile enough to also detect floors, walls, objects and keep a track of the exact x,y co-ordinates of your main character.

You must use a routine that is versatile enough to also detect floors, walls and objects.

The only way to make a multi-directional scrolling platform game of high quality is to use The Missing Link's MAP commands. The maps are made up of an x number of 16x16 square blocks previously designed by yourself. Use the supplied software to

design the map - you have the option to use the same blocks as many times as you wish. The position of every single block is then stored in a memory bank, providing you with simple, fast and easy-to-use commands that allow you to keep track of every single block at any given time during your game.

The 'which block' command enables you to detect which block is at any position you specify, so if you keep your main character in the centre of the play area and only move the map (as discussed in last month's tutorial), you can find which block is under your main character with just one command in your main loop.

Everything is governed by the 16-pixel horizontal boundary rule. This can be used to your advantage and makes collision detection a simple task.

Place your main character at a central position on your map at co-ordinates that contain multiples of 16. If you now move everything 16 pixels at a time you have achieved pixel-perfect detection, but your map is moving far too fast. A little trickery is needed: set your map to move two pixels at a time for slow smooth scrolling. When the joystick is detected you will need to move your map eight times two pixels instead of just two pixels. This gives the illusion of moving slowly while keeping your routine on a multiple of 16.

A good example of this system is the shooting routine used in HERO. The main character is 32 pixels high, while the baddies are all 16 pixels high. This enabled me to detect whether a baddie was in line with the top 16 pixels or the lower 16 pixels of the main character. A standing and kneeling animation routine was added, injecting a little bit more reality into the game.

If your main character shoots a gun and the baddie directly in line dies, it is blindingly obvious what has happened. There is no need to show the bullet floating along. This can save you a lot of programming, and avoiding the extra sprite will give the computer much-needed processor time. *stf*

STOS NEWS

Software houses have a habit of keeping projects a secret until near completion for fear of others copying their ideas. However, I have tested an early version of the much awaited Eagle extension and it has 106 very useful new commands. Although the release date is uncertain, this is one to look out for.

A 'multimedia authoring package' similar to the type seen on the PC is to be released within the next three months. Again STOS is ideal for this type of program.

An authoring package enables you to put together text, music, samples, pictures and animations into one program. The user can then read through the information by interacting with the package, for example by clicking on buttons and boxes. The person putting the package together doesn't need any programming skills as most of the work is done by dragging the various pieces of text and graphics on to the pages ready for use.

HERO is to be revamped and re-released at a realistically low price through STOSSER SOFTWARE. Bob Goodfellow and I (the co-producers of HERO) have also started work on a totally new game entitled TIME SLIPS. The new game will feature a three-quarter 3D effect environment where the main character will have the ability to walk around objects, such as trees and buildings. The emphasis will be on role-playing, problem solving and feature routines not only new to STOS but also not normally found on the STFM.

The above-mentioned environment is achieved with eight-way scrolling that surpasses the smoothness managed in HERO. A two-plane parallax full-screen scroll has also been created for a sub-level. These routines have been tested with a larger than normal main character sprite.

There is no release date as yet for TIME SLIPS as work has only just begun in earnest, but we will keep you informed.



Coming soon... a follow-up to HERO.

A new STOS user group is being formed, called STOS Friend Chip. It is aimed at programmers all over Europe. There are no fees involved and a regular disk magazine is to be produced. For more information and a copy of the first user disk contact: Wilfried Kickeit (Take-5-Team), Lindenstr 16, 96482 Ahorn-Scherkendorf, Germany. You will need to send a disk that contains PD software, preferably STOS-related, and return postage.



Along with the famous Fun School, Magic Storybook proves that STOS is the the tops for producing educational software - as well as games, applications and serious software.

TOP TEN ACCESSORIES

Compiler	Used with compiler software
Sprite	Sprite design and manipulation
Compact	Picture packer
Display	Read doc files/instructions etc
Whatnbnk	Keep track of stray banks
Make	Converts BNKs to Missing Link format
Mouscolo	Mouse X, Y co-ordinates and pixel colour
Fontdisp	View and change fonts for different projects
Link	Quick reference to the link commands
STOS Paint 2	Art package for last minute touch-ups



STOS Paint 2 - an art package as a STOS accessory.



Whatever you want, it can't be done. A gloomy Frank Charlton fails to complete his 'missions impossible', but gets in a good word for STOS.

STOS Corner

WORMHOLES

Q I am writing a game in STOS, similar to WORM on the PC. I need to increase the length of the worm when he picks up the number, but I'm not sure how to do it.

Ben Pope, Polegate, East Sussex

A Sorry to be negative Ben, but I've never come across WORM, and nor had anyone I asked. Without a few more details as to what you want to do, I'm stuck for an answer, I'm afraid. Put what you've done so far on a disk and send it to the usual address (see below), and I'll see what I can do. Though we don't actually do this, if you include an SAE I'll make sure you get your disk back. Be warned, everyone - this is my once-a-year, not-to-be-repeated-until-next-year, generous gesture. We don't normally have time to return disks.

ACCESSORISE!

Q Is there a way I can compile and save a STOS program as a GEM Desk Accessory?

Bob Yeague, Lewisham

A I'm afraid not, Bob. As we've said before, STOS ignores GEM totally, relying on its own custom routines to drive the mouse, read the



If you want to write Accessories, you'll need another language. Try C, then you can send your questions to Mac Marsden at well



HiSoft C. Interviewed yesterday. When asked about alleged liaisons with STOS, C told us, "No comment".

keyboard and suchlike. GEM Accessories can be troublesome to write at the best of times, due to the nature of TOS. If you want to get into it, you'll need a more 'operating system-friendly' programming language, such as GFA or HiSoft BASIC, or C. HiSoft is especially good, with full GEM toolboxes to take the pain out of GEM work.

ALL AT C

Q I have been following Mac Marsden's C tutorials recently, and experimenting with the HiSoft C Interpreter. I understand that it isn't a compiled language, but if I bought a full C compiler, could I write small routines which I could then link into my STOS programs? I know you can link assembly language routines, but that's all Greek to me.

Dipesh Kandola, Bradford

A Unfortunately not. Dyluck. When you use assembly routines with STOS, you're not actually linking in the true sense of the word. Real linking is used by assemblers or C compilers to make other routines accessible to a program when it's compiled or assembled. With STOS, you load a pre-assembled piece of code into

a STOS Memory Bank, and execute it when needed. Since you can do that in either interpreted or compiled mode, it's not linking. I don't think it's possible to do this with compiled C routines, but I'd love someone to prove me wrong!

WHERE IS...

Q Whatever happened to Francois Lionet, the author of STOS? Do you think he'll ever update STOS to work properly on the Falcon030, and write some new commands for it?

Mark Ross, East Dulwich

A The last I heard, Francois was in the Army, doing the French equivalent of National Service. I haven't heard anything since, but it seems doubtful that we'll see anything STOS-related from Francois. The future of STOS lies with us - the users. Every major STOS development since STOS-3D has been independently written - just look at the Missing Link and Control 3 extensions.

GAME ON!

Q I've been learning STOS for about a year now, and I'm starting to feel confident enough to tackle a game idea I have, which I want to release as shareware. I'm beginning to lose confidence though, as a number of people have told me that STOS isn't good enough for anything other than simple PD



HERO, a commercial game written in STOS? Surely some mistake?

games. Is this true? Should I bother trying?

Dan Kirk, Portsmouth

A In a word - go for it. Oh, that's three words. Nevertheless, you shouldn't let other people put you off something you want to do.

STOS has been used numerous times for commercial and commercial-quality games. Just look at the wonderful platformer, HERO. It had very good reviews when it was released, and only afterwards was it discovered that it was a STOS program! Written by our own Tony Greenwood, HERO had so much hard work behind it that it didn't shout "STOS!" like so many PD games.

If you followed Tony's recent tutorial series (STF 71-72) you'll have picked up some tips on game writing. Don't let anyone get you down, just get into it, and let us know how you get on.

You can write to the indomitable Frank Charlton at: STOS Corner, ST FORMAT, Future Publishing, 30 Monmouth St, Bath, Avon BA1 2BW or e-mail him at: frank@tachyon.demon.co.uk, or Frank.Charlton@adlib.centron.com.



Despite recent attempts to replace him with a sophisticated artificial intelligence computer, Frank Charlton is here again to soothe your STOS pains.

STOS Corner

CUE PLAYBACK...

Q I am writing my first program in STOS. I only know some of the language, and some assembly language. I've almost finished, but what I want to do now is have some stereo music from Quartet playing on the title screen, which displays a picture in Spectrum 512 format. I have a Microdeal Playback cartridge, which gives stereo output even on an STFM.

The player routines from Quartet aren't for STOS, and only play in mono. The ones supplied with Playback work in stereo, but don't give instructions on using them with STOS. I need some code in STOS and assembly to play music back in three ways: mono for STFM, stereo for the Playback cartridge, and stereo for STE owners.

Richard Fullaway,
Kingsworthy

A Unfortunately, Richard, I'm not an assembly programmer, and I don't have access to either a Playback cartridge or the routines supplied with it.

There is a Quartet replay routine for STOS users knocking about, and you should be able to pick it up from any PD Library with a decent STOS collection. The routine does play music back in stereo for STE users, but has no provision for the Playback cartridge. If anyone has written working routines which can play any music back in stereo via Playback, please get in touch and we'll feature them.

I should also point out that you're going to have problems trying to play Quartet music at the same time as displaying a

Spectrum 512 picture. Both routines are rather heavy on the ST processor, and won't happily co-exist with each other. It's a bit less critical on an STE thanks to the DMA hardware, but an STFM can't manage it, I'm afraid. The Quartet routines in particular are so CPU-intensive that the mouse needs to be disabled, because moving it slows down the music. Sorry I couldn't be more help.

JOY OF LINKS

Q Thank you for answering my query about data transmission in Issue 72. I have a further query for you on this subject, though.

In your reply you mention that the ST's MIDI ports can transfer data in excess of 30,000 baud. How do I go about setting the speed in STOS? Is it already set when the ST is first switched on? Andrew Robertson,
Strathclyde

A Glad to help, Andrew. Unlike the modern port which can operate at different speeds, the ST's MIDI ports only have one speed. You don't need to configure any speed parameters, which is another reason why they're a better choice for multiplayer link games.

If you're not convinced that a game can be greatly improved by the addition of a link, take a look



The multiplayer link option makes Substation a whole lot of fun.

STOS MAILING LIST

The STOS Mailing List on the Internet is alive. Les Greenhalgh, who previously ran the list at stos@bath.ac.uk, has left University to make his way in the big bad world. Rather than see the list closed, Anthony Jacques has stepped in and found a way to carry on at a new e-mail address. To join the mailing list, send a message to stos-request@man.ac.uk with a line in the message as follows: subscribe stos

yourname@your.email.address To send mail to everyone on the list, address the e-mail to stos@man.ac.uk. Be patient if you don't see any replies right away, as Anthony is away on summer vacation. By the time you read this, the new term will be starting, so the list should be active again quite soon. Lots of kudos to Anthony for sorting this out, and Les should re-appear in the list when he gets a new Net account.

Post Box

Send E-mail To

stos-request@man.ac.uk

OK

Select

Cancel

Keep in touch with other networking STOS users, thanks to the STOS Mailing List.

at a linked game of Substation. We played it at the Spotlight Show, and Nick and I were almost at each other's throats - it was much more fun. Oh, and Nick cheats, too.



STOS6er is an excellent source of STOS info, but where do you find it in Australia?

DOWN UNDER

Q I am finding it very hard to get STOS6er disk mags here in Australia. Can you please let me know where I might find them on the Internet, as they really are the only way I can get Atari software these days. Mike Murphy, Australia

A There is a limited selection available on the west University of Michigan site (ftp://atari.archive.umich.edu, or try one of the more accessible mirrors such as src.doc.ic.ac.uk), but there are only a few issues and they're very out of date.

One option would be to find a Netter who is willing to send you the disks via good old snailmail.

There are plans afoot to make the full selection of STOS6er disks available via ftp, starting with recent issues and gradually going back, but nothing is confirmed yet. More news as I get it - since you're so far away, I'll e-mail you.

Send your STOS queries to: STOS Corner, ST FORMAT, Future Publishing, 30 Monmouth St, Bath, Avon BA1 2BW, or e-mail your questions to: frank@tachyon.demon.co.uk (please put STA in the subject line).



There's light at the end of the tunnel for Falcon owners. Frank Charlton peers down the track and takes a look at forthcoming STOS extensions.

STOS Corner

Hot on the heels of your recent questions about the performance of STOS on the Falcon030, here's news of two forthcoming STOS extensions which take advantage of the Falcon's graphic and sound capabilities.

First up is the *STOS Falcon Extension*, currently being developed by Anthony Jacques of *STOS Mailing List* fame. Anthony's extension includes lots of different Falcon-related commands, including general stuff like reading the Cookie Jar and finding out whether a program is running on an RGB, VGA or mono monitor, or a TV set. There's also a handy command to read a Jaguar PowerPad.

Sound support is good too, with nifty commands for playing standard 4-channel MOD music as well as the multi-channel DTM modules produced by Frontier's *Digital Tracker 030*. Both use the DSP

chip for minimal slowdown, and sound great. Sampling via the DSP is also catered for – both recording and playback are possible via the Falcon's built-in hardware.

Graphics support is excellent, with commands for everything from drawing Gouraud-shaded vector shapes to displaying 256-colour and TrueColour images on the screen. Replacements for the regular STOS palette and fade functions are provided so you can work with the expanded palettes and resolutions. There's even an early version of a TrueColour sprite engine.

You can contact Anthony via the *STOS Mailing List*, by e-mail at: jacques@cs.man.ac.uk, or by post at: 70 West Avenue, Oldfield Park, Bath, Avon BA2 3LF.

FAB FOUR

Next is a suite of four extensions which is being developed by Anthony Hoskin to

exploit the Falcon's capabilities – the *System Control Extension*, the *GRAFIX Extension*, the *DMA Sound Extension* and the *MODule Player Extension*.

The versions that we saw were still being developed, and may well change quite a bit before they are released. Anthony intends to make the interpreter extensions freely available, but the compiler versions will only be available to registered users.

The *System Control Extension* currently features 23 commands that control the Falcon's system features. It provides some interesting and unusual functions, such as switching the processor cache on and off, and switching the Falcon's system bus into STE-compatibility mode.

The *GRAFIX Extension* doesn't yet support TrueColour video modes, although Anthony is working on it. Currently, you can load, unpack and display 256-colour images in the ILBM (InterLeaved BitMap) format common to the Amiga. Registered users will receive image conversion utilities to help with this. *GRAFIX* also provides a healthy helping of commands to manipulate the expanded palette and blit text to the screen using regular GEM fonts rather than the old STOS format.

The *DMA Sound Extension* plays back sampled sound via the DMA sound subsystem, and accepts samples in the common AVR and WAV formats as well as raw sound data. The commands are very flexible, with every individual parameter available for tweaking. You can even adjust



The DMA Sound Extension provides a simple but effective sample player program as well.

the gain of each stereo channel individually, if you want to – excellent stuff indeed.

Finally, the *MODule Player Extension* will replay standard 4-channel MOD files via the DMA system – there's no DSP support currently. Sound quality is good, and it differs from Anthony Jacques' player in that it doesn't need a separate program to be loaded into a memory bank first.

For more information about all these extensions contact Anthony at: 45 Wythburn Road, Newbold, Chesterfield, Derbyshire S41 8DP.



Source code with the MODule Player Extension shows how to play MOD files via the DMA.

HERO FREEBIE

Remember the animated platform game, *HERO*? Programmers Tony Greenwood and Bob Goodfellow spent a lot of time making sure it didn't look, feel or play like a generic STOS game, and it was generally very well received.

Seemingly it didn't sell in massive amounts though, and after a brief scuffle behind the bike sheds, the authors have decided to release it as freeware. What's the catch? Well, in order to keep the size down, Tony has removed the excellent animated intros and end sequence, and the in-game

sound samples have been given the chop. Still, it's a damn fine game, and well worth looking at if you want to see just how polished a STOS game can be. Check your PD Library, or pick up *HERO* from AdLib BBS on 0191 3702659.



Send your STOS questions to Frank at: STOS Corner, ST FORMAT, Future Publishing, 30 Monmouth St, Bath, Avon BA1 2BW, or e-mail them to: frank@tachyon.demon.co.uk (please put STA in the subject line).



This month Frank Charlton bemoans the dearth of STOS questions. STOS programmers, where are you? Why don't you write to us any more?

STOS Corner

DODGY DISKS

Q I am only 13, but I have programmed quite a lot of good stuff in STOS. Unfortunately, a virus got into my disk collection, and I lost STOS 2.5.

I've looked everywhere for another copy - I've tried all the local shops, and I even wrote to Mandarin Software. A company called Europress wrote back to say it no longer supports STOS (shame). Could you please, please tell me where I could get a copy, and how much it will be.

Benjamin Bradley, Redruth

A Bad news, Benjamin. Europress stopped supporting the STOS range - and the ST, in fact - quite a long time ago. Unfortunately, it

FALCONISMS

Last month we mentioned Anthony Jacques' fledgling STOS Falcon Extension. Anthony has been kind enough to send us a vastly updated version, which he feels is ready for release.

Version 1.0a is complete, and the supplied Compiler Extension will compile most of the commands available in the interpreter version. Anthony will be continuing to update his extension, but he feels an early release might encourage feedback and suggestions.

We don't know whether Anthony has distributed the STOS Falcon Extension to any PD libraries yet, but he's given us permission to spread copies of the unregistered version. Both Ad.Lib BBS (0191 3702658) and LAPD (= 01773 761944) should have it by the time you read this.



The Falcon STOS Extension even enables you to display TrueColor graphics from within STOS.

won't pass on the rights to STOS to anyone else, either.

STOS has been on an ST FORMAT Cover Disk, but it was a few years ago, and we no longer have that issue in stock. Sadly,

your only chance of getting hold of a replacement copy is to advertise for a second-hand one. Fill in the coupon on page 70 to put an ad in our free classified section.

Also, if anyone reading can help Benjamin, please get in touch with us and we'll be happy to pass on your suggestions.

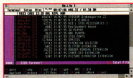
EXTENSIONS

Q I have many questions, most of which I can't remember, so please tell me which PD library has a good selection of STOS extensions. I especially want the STE Tracker Extension mentioned in issue 72.

Mike Walker, Doncaster

A Goodman PDL always has a good range of STOS disks - call = 01782 335650 for details.

Alternatively, if you have access to a modem, the Ad.Lib BBS now has a large file area devoted to STOS, stocked by none other than STOSSER's Tony Greenwood. The extension you want is available there, along with many others. Call Ad.Lib BBS on 0191 3702659.



Ad.Lib has the biggest STOS support area of any BBS.

STOS
The Game Creator

POWERPLAY
THE WAY



Written by P. Loomis & C. B. B. B. B. B.

Sadly, STOS is no longer supported by Europress.

BEGINNERS GUIDE

Mark Thomson of MT Software has written in to tell us that MT is no longer involved in the Atari market. This means that the excellent book *The Beginner's Guide to STOS BASIC* is no longer available - all printed stocks have been sold.

Rather than disappoint everyone who's been asking about it, Mark has converted the book's tutorials into a disk-based programming course. It comes on three disks and provides more than 190 examples of STOS programming, ranging from complete games and art packages to GCSE maths.

The disk version of *The Beginner's Guide* is available from MT at: 14 Lanes End, Totland Bay, Isle of Wight, PO39 0AL, for the princely sum of £6.95. If you're interested, make your cheques payable to T Thomson, and watch out for a review next month.

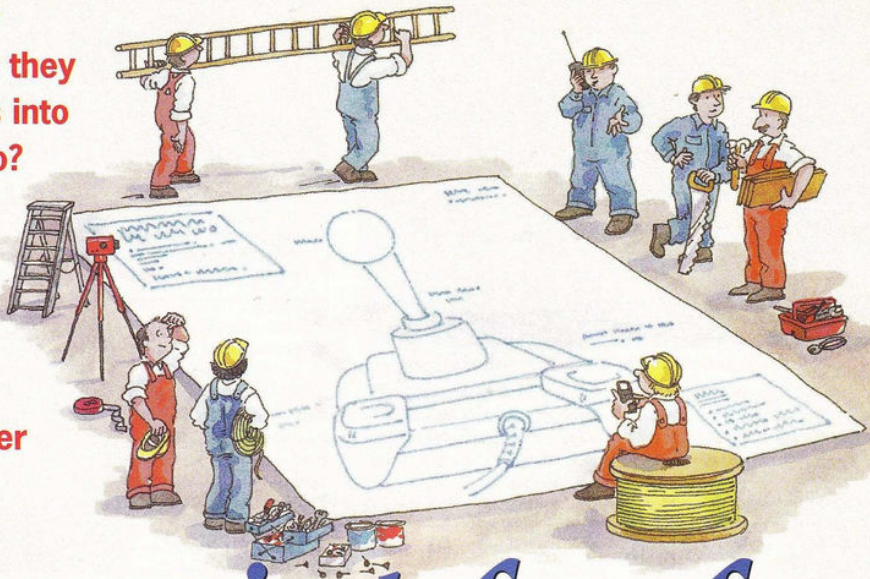
END OF AN ERA?

Sadly, there may not be many more STOS Corners. The number of letters and questions coming in has been slowly decreasing, and unless you start writing in again, we may have to drop this section.

STOS Corner has been running for years now under many different whens - could it be that you're all proficient in STOS programming now, and don't need to ask for help quite so much? If that's the case, we're very pleased, but if you've got questions and have never bothered to write in, now is the time, before STOS Corner disappears forever...

Send your questions to STOS Corner, ST FORMAT, Future Publishing, 30 Monmouth St, Bath, Avon BA1 2BW, or e-mail them to: frank@tachyon.demon.co.uk (please put 'STA' in the subject line).

Have you ever wondered how they get the stripes into toothpaste? No? Then maybe you've wondered how games are created. Simon Forrester explains.



Blueprint for fun

Games are the most influential driving force behind any home computer. The ST and Falcon were originally designed for leisure applications, because that's the main selling point for home users.

If you're a keen game player, chances are you've thought about creating a game of your own. However fond you are of your favourite title, there's always something that could be improved. Why on earth did the programmer use such-and-such a key, or put the bonus there, or use that strange colour-cycling effect? Any fool knows...

Ah, but it's easy to create a perfect game in your head. Unfortunately, it isn't quite so easy to write one. A word processor only has to shunt text around the screen, and any extra functions simply involve manipulating that text in memory.

Spreadsheets and databases work in the same way – they display simple text models on screen, perform straightforward calculations and occasionally access disks.

Games, on the other hand, are far more complex – the material they display on screen has to be fast, smooth and

graphically pleasing. Their calculations work on a deeper level, too. Whereas a spreadsheet does the bulk of the clever

It's easy to create a perfect game in your head. It isn't so easy to write one

work when the user hits the Calculate button, a game has to keep checking where the sprites are, how they're moving and whether they've collided. It must also monitor everything else on the screen and work out how it affects the player, while maintaining a constant speed and screen update to avoid getting a bad review, peppered with the words 'slow' and 'down'.

The other big problems are that a spreadsheet doesn't have to be fun, and a lot of the design is left to the user. When you're writing a game, the design of each level, the challenges held within it and the

SCROLLING GAMES

Forced-scrolling games are those where the player has no control over direction. Classic examples include *Space Invaders* and driving games. These games are fairly easy to design because you already know the path the player will take. All you have to do is arrange obstacles. If you already have a good scrolling routine, these are ideal first projects. They're straightforward to design, but

can still be complex and involving for the player.



abilities of the player's character are up to you, and the end result has to be challenging, provoking and entertaining.

Over the next two months, we'll be taking an in-depth look at designing and implementing your own computer game. This month we'll be dealing with the design aspect, because before you think about programming you have to have a game to code.

You need to decide exactly what kind of game you're

planning to write. There are several different distinct game styles, including forced scrolling, platform and simulation. You'll find more information about each type in the



The Dizzy games feature logical problem-solving platform action, but suffer from some pedantic gameplay rules.



Killing Impact plays like a dream, moves like an eagle and steers like a cow.

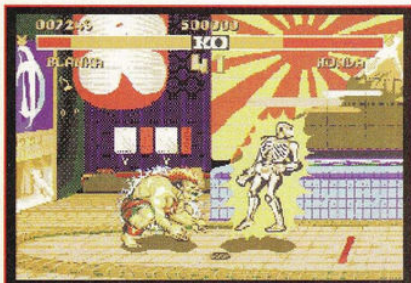


Dream

The first qualification you need to design games is experience. Ideally you should be

able to say: "I've played hundreds of them." What type of game do you enjoy the most? With any luck, you'll know exactly what kind of game you want to create. If you're going to spend several months designing, coding and tweaking you'll do well to work on a game type you enjoy. Whatever you decide, ask the following questions:

● **Is my idea easy to understand?** One of the (few) pluses of *Escaping from the Castle of Mystery* (STF 82, 20%) was that each part of the game was instantly understandable. The tasks weren't always simple, but the player knew what to do. Conversely, *Kryptonite Data* (page 26) starts with the player wandering aimlessly around the playing area.



Street Fighter 2's special moves, which are activated by complex joystick wagging, test the player's speed and dexterity.

● Is my idea attractive?

Although *Castle of Mystery* players knew what they had to do, the idea didn't capture the imagination.

● **Does the player have incentives?** There has to be a point to playing – fruit machine games are fairly pointless because they always do the same things and don't give out any cash. Be it a gradually increasing difficulty curve or new levels, there has to be a reason for playing, and a reward for playing well.

Drawing board

Though we can break the different aspects of game design up into distinct sections, they're inter-related – your level designs are dependent on the puzzles you want to include, which in turn are related to the abilities of your player's character. These abilities are linked to the player's control system.

Control system

The first thing you have to worry about is exactly how the player is to control their character. The recent highly-rated

Killing Impact (STF 77, 85%), stuck to the joystick control system. This leads to problems when the player collects extra power-ups, because the ST's joystick only has one button.

If you give the player too many extra

PLATFORM GAMES

Platform games have always been popular on the ST. Whether it's the classic jumping-about-and-killing formula of *Magic Boy* or the more complicated, explore-'em-up elements of *HERO*, a platformer is easy to get to grips with because it invariably involves a person fighting gravity. Platform games tend to rely on timing puzzles and reflexive action, but the more problem-solving



elements you can include in your game, the better.

abilities, they won't be able to control them all with the joystick.

Killing Impact's answer was for the player to hold down [Fire], pull the joystick in a direction and then release the fire button. This wasn't the best solution, because it made it difficult to use a mine or laser quickly, throwing you into scrapes unfairly.

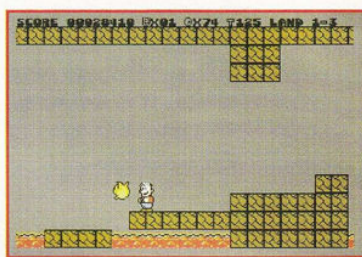
When you're designing the characters and playing environment, remember the players are coping with eight possible directions and a fire button.

Street Fighter 2 came up with a novel solution to the control problem: the player achieves special moves using a

series of joystick waggles. To throw a fireball, for example, you push down, down-right, and right (in sequence), then

hit fire. These moves are a balance between fluidity and obscurity – they work in circular sweeps and use natural movements but they're obscure enough not to be used accidentally. Part of the challenge of the game is the mastery of these moves, which push the player's speed and dexterity to the limits.

On the other end of the scale, *SubStation* and *Frontier* rely on the keyboard because the player has a lot to control. There's nothing wrong with this as long as your game warrants it – *SubStation* players rely on sidesteps, weapon changes



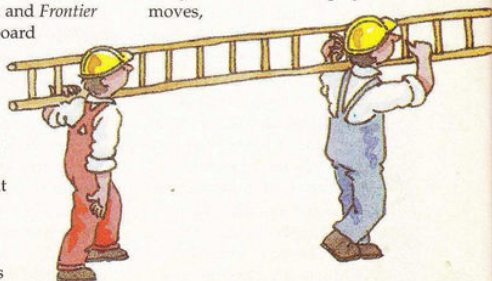
The platform game *StarionLand* doesn't have many secret areas, but it's still a lot of fun to play.

and so on, and there's a limit to how much you can cram on to a joystick.

The increased complexity is a result of the designers' attempts at realism. In a game involving hiding behind walls, strafing through doorways and dodging enemies, the more sidesteps, fast turns and dodges the player can use, the better. It takes a long time for the player to become used to all this, but if your keyboard layout is reasonably natural and the initial gameplay doesn't require complete mastery of the controls, the interface soon becomes transparent. If you can avoid the keyboard, though, do so.

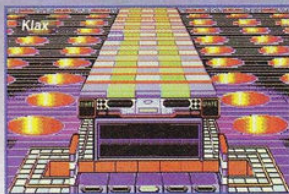
Player abilities

So what abilities should your player have? If you're writing a flight sim or driving game, you'll already know the answer. The same applies for scrolling shoot-'em-ups – it's fairly obvious how the player moves,



ABSTRACTIONS

And then come the abstract games, a genre encompassing the legions of puzzle games and weirder titles such as *Vaccine* and *E-motion*. If you come up with a completely novel idea for a game, code it immediately – the author of *Tetris* is currently lying by a pool in a sunny part of the USA.



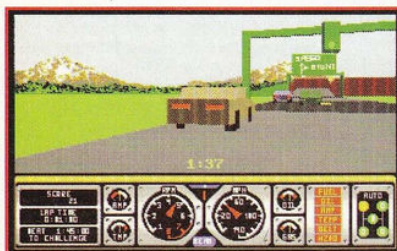
so only the weaponry needs to be considered.

Weapons are important in action games – if the player is expected to kill things, it's your job to provide the means. Each new weapon should have a new use. For example, *SubStation* gives the player a knife as well as a gun. Unfortunately, its weaponry from then on all follows the same pattern, getting more powerful without becoming more diverse. Where were the ultra-powerful, open-spaces-only rocket launcher and the bouncing grenades?

Similarly, you can't drop someone into a war zone without allowing them to duck. *HERO* is an excellent example of a game with an easily-controlled but flexible character who'll co-operate with the joystick and act fairly intelligently. *STario* can duck, and fall for miles without getting hurt, but *Dizzy*, who lived in a world peppered with large drops and trampolines, suffered concussion every time he fell more than half a screen.

Level design

Once you've created your characters, you need to give them an environment to play in. You'll have to fit this world smoothly into an ST, so bear in



Hard Drivin', a car simulation that has you doing loops, jumps and ramps with relative ease.

mind the technical demands of this process.

Each level must have both a start point and an obvious goal. Always remember that the player doesn't know what is around the next corner. If Mr A Perfectgamer walks up to your game, he should be able to complete it without losing a life, because there'll be a logical, perfect solution to every problem. Even the nasty surprises should be fair. If a piece of floor that looks like every other piece of floor suddenly drops away without shaking a little first, giving

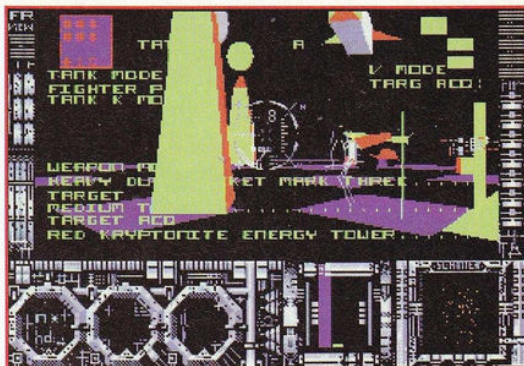
the player no chance to jump away, he or she has every right to track down the designer and beat him up.

It's wise to only design one

level before you start programming, because that's when you'll discover all the glitches. You can then iron out the bugs before creating the rest of the levels.

Try not to make the game-play too linear. Everybody approaches a problem in a different way, and if you deny players the chance to be creative, they'll hate you. It's also a good idea to put several paths into any level, a feature unfortunately missing from *STarioLand*. Providing more than one path makes the game more enjoyable to play (there's

a point to exploring) and increases its lifetime. Players can complete the game several times, finding new things to explore, new routes to take and entertaining new challenges when they go through each level a second time.



Turn back to page 26 to read this month's review of *Kryptonite Data*.

Problem

So, what do these levels contain? There are three main types of obstacle:

- **Enemies:** Whether they're fighters in a beat-'em-up, ships in a scrolling shoot-'em-up or swordsmen in the excellent platformer *Prince of Persia*, enemies provide the challenge in most games. In order to progress, the player must defeat these foes using the controls you gave them. In a beat-'em-up, these controls are specific to fighting, whereas games like *STario* have the player jump on the enemy's head using their normal directional controls.

- **Logistical puzzles:** At the other end of the scale you'll find games like *Dongleware's Oxyd* which, despite being essentially action-based, gets its challenge from puzzles rather than co-ordination. The game features you, as a small black crystal, playing pairs with blocks. You must navigate switches, collapsing floors, lasers, doors, sliding blocks

and all manner of other objects in a bid to match the shapes.

- **Reflex tests:** The third type of in-game challenge comes from reflexive puzzles. Usually the goal is to survive rather than win, and these tests tax the player's timing abilities rather than their logical skills. For example, driving simulators call for reflexive control of the car.

Time to program

By now, you should have a good idea what your game needs to be: challenging, involving and fun. Next month we'll be explaining how to take the game from paper to the computer screen.

stf



SIMULATIONS

Eek – sims are almost always 3D and usually involve the player's ability to roam the game world freely. They are therefore difficult to design. Flight sims, for example, can't rely on problem-solving because the player can fly around obstacles. Like most sims, they are mainly foe-based. From a design angle, you must also take care to give the player clearly defined goals – they may not be stuck to following any clear path or route, but they must always know where they're going.

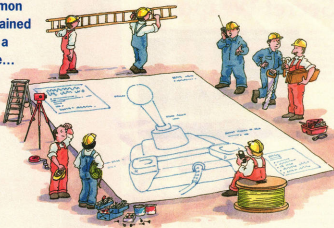
Alternatively, games like our Jag competition entry *Sub Aqua* (see page 38) combine a 3D system with shoot-'em-up-style

weaponry. As with all game ideas, the possibilities and permutations are endless...

If you decide to write a simulator of any kind, be careful – they nearly always require large amounts of keyboard-based control. *SubStation* and *Frontier* neatly illustrate the point.



Last month Simon Forrester explained how to design a playable game... this month he shows you how to turn those plans into code.



Blueprint for fun

Last month we covered the relatively straightforward task of planning a game on paper. Sadly, sitting down and musing about the intricacies of game design is nothing compared to turning those ideas into a piece of software.

This month, then, we're going to undertake the latter task. Yes, it's time to put all that simple programming work you've done into practice and write one huge program. No, don't run away.

Writing a computer game isn't easy, but there are several ways to make things a great deal simpler. The first is to break it all up into little steps.

All the processes involved in the running of a game happen almost simultaneously – there are no clear borders between the enemy sprites moving, the program taking the player's input, collision detection and so on – but we'll look each part of the game's engine separately, in the order you'll have to write them.



The following instructions are specific to the game plan I've outlined in the Space: Big and Empty panel, but they're applicable to just about any game engine. We'll be working in STOS, because it seems to be the language of choice for first-time ST game writers.

How to code

You'll need a lot of programming experience to write a good computer game. This experience is invaluable, but you'll be coming up against a whole new obstacle with this project – speed.

If's comparatively easy to write a utility program to perform a specific function, because you don't have to worry how long it takes to complete the operation. Your spelling checker can't take half an hour to search through its dictionary, of course, but a second or so is acceptable.

With a computer game, this isn't the case – everything has to run incredibly quickly, because if your game runs too slowly, or slows down to cope with those extra sprites, it'll be unplayable.

Keep speed in mind every time you write a line of code

and use the minimum number of commands to complete each task. As you work, you'll find yourself picking up new tricks to save those vital milliseconds – revise the rest of your program to work as quickly. Here are a few things to remember from the outset, though:

● Don't use IF statements:

For some arcane reason, IF statements are incredibly slow. There are many ways to avoid them, such as the technique for vector calculation shown later.

● Avoid subroutines: If

something can sit directly in

the flow of the program, there's no need to waste time jumping to it. If the same routine is called several times, consider pasting it in directly – it takes up more memory, but it's faster. One GOSUB may not seem like much, but when it's executed five times a second you can lose a lot of time.

● Stick to simple commands:

The more complex the function, the longer it'll take.

● Write a bare-bones engine first: You can add the frills once you know the system can handle them.

SPACE: BIG AND EMPTY

It's a good idea to start off simple, because no matter how basic your game idea is, your program will soon be a complex piece of spaghetti. Try to define your game's design in simple terms from the programming point of view, as I've done below.

Space game

The action takes place on a top-down (overhead view) arena made up of squares, 19 across by 13 down. Each square is the equivalent of two character squares, totalling sixteen pixels in each direction – the game runs in low resolution only. Each of these

squares will contain an item or nothing at all.

The player takes the form of a joystick-controlled spaceman, interacting with solid obstacles, conveyor belts, keys, doors and all manner of other devices. These can be designed and coded once the main game engine is in place and running (you don't need to finish designing your game before you start coding).

The object of each level is to reach the exit square, the obstacles and interactive player objects providing the puzzle element. This is, essentially, a puzzle game.

The engine

So, this is the game's engine, then. To properly comprehend all that's going on, you'll have to assume the whole thing's already running several times per second as you write it.

It's this problem that makes game writing such a weird programming task – you're not writing small, separate chunks of code. Instead, you start with a completely empty loop and add more and more operations to it, until you have a finished game. (Before you get to this point, you should have displayed your backdrop on screen – see the Backdrops panel.)

Input

The first thing you need to add is the player's input. This is probably the simplest of the tasks in the engine, although the more complex your game gets, the longer it'll take.

Basically, you need to read the joystick or keyboard to find out where the player wants his character to go. This involves keeping an eye out for the four directions a joystick can take – up, down, left and right.

STOS allows us to do this by running system variables containing the information. `JOYUP`, `JOYDOWN`, `JOYLEFT` and `JOYRIGHT` will each return -1 if the joystick is being pushed in that direction, and 0 if it isn't. Alternatively, the `JOY` variable contains all of the information in a bitwise format – the binary number is split up into binary bits, each giving a result as either a 1 or a 0.

Next, you have to turn this into a movement vector, in preparation for moving the sprite. This is done by multiplying each of STOS's `JOYUP` and `JOYDOWN` results by -1. A 0 will remain 0, whereas -1 will turn into +1. You then add the left and right, and up and down, pairs of vectors together to obtain a movement vector for each axis.

Confused? The following chunk of listing reads the joystick and produces two variables, `vx` and `vy`. These variables can be added to your

sprite's current position to produce the co-ordinates the player wishes to move to. We're assuming here that the player is moving a

pixel at a time, by the way – for bigger steps, simply multiply `vx` and `vy` by the step size.

```

1) vx=JOYUP-JOYDOWN:vy=JOYLEFT-JOYRIGHT
   (all one line)
2) vx=vx*(-1*5)
   vy=vy*(-1*5)

```

You now have your vectors and are ready to move the sprite...

Sprite movement

...or are you? Before that sprite goes anywhere, you have to make sure it's allowed to. Checking whether the player is trying to run out of the playing area altogether is easy enough – just check whether the new co-ordinates are out of bounds, and don't move the player if they are.

Next, check whether there's anything in the player's way. Take a look at the Backdrop panel at this point

STOS

The Game Creator

MANHATTAN
SOFTWARE

valve

Written by F. Lionet & C. Sotiropoulos

STOS – It's the language of choice for most ST game writers.

for a description of one way to store the level data. You can read that back and, if there's something where the player wishes to move, destroy the movement vector (by setting it back to zero) to stop them.

Assuming the player is allowed to move in the specified direction, you have to both move and animate the sprite. In cartoon circles this amounts to the same thing, but here there's a distinct difference – when you move the sprite, you simply shift the graphic to another position on the screen. When you animate it, you actually change the graphic you're moving.

If a sprite of a walking

man is only moving two pixels, you simply need to move the sprite and change the graphic to one showing the other foot position when it gets there. My space game requires the sprite, once moving, to travel the whole sixteen pixels to the next square, making a walking movement all the way – it's a puzzle game, so the player shouldn't have to worry about pixel-perfect accuracy. This is a fairly simple task, achieved using STOS's `ANIM` command.

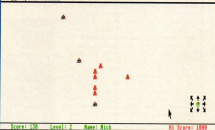
This command refers to a string containing pairs of numbers, the first referring to an image number, the second to the length of time, in 50ths of a

BACKDROPS

Before you set your all-important game engine running, you need an environment for the game to take place in. My space game is fairly simple in this respect, because it works strictly to a grid. This makes for uncomplicated level data – I can create a 3D numerical array with space for the data from 16 levels, each with 19

squares across and 13 down. Each slot contains a number, representing the contents of that particular square – it could be a blank space, a solid block, or any object I've assigned a value to. This system is handy for collision detection – the contents of any part of a level can be determined by a quick look at the variable.

A. Option Command



Daleks: The bad guys in this game were stupid – they'd do everything they could to get to you using a simple equation. And they couldn't go up stairs, either.

That mathematical collision detection idea (see opposite) in full.

statements. The answer is to dimension an array to cope with all three strings (for the **MOVE**, **MOVE X**, and **MOVE Y** commands) for four directions, and adapt your movement vector to produce a number from 1 to 4 to select the appropriate one:

```
j1=JUMP*4:j2=JUMP*4
j3=JUP*4:j4=JUMP*4 (one line)
j1=j1*4-1:j2=j2*4-1
j3=j3*4-1:j4=j4*4-1 (one line)
w[j1+j2+j3+j4]*j4+j3+j2+j1
```

You may have to read up on binary, folks (Help! - Nick).

Decisions

This is a difficult topic to discuss, because different game styles all have their own particular features. One thing that's common to most games is the enemy.

Does your game have moving foes? If it does, the odds are they're going to have to act intelligently.

Though this is essentially a game design point, its mechanics are deeply routed in programming and

the amount that can be achieved in the fractions of a second you've got to spare.

There are a number of different techniques you can use:

- **Stupid:** Remember the game called *Daleks*? The enemy moved straight for you at all times. This is a simple technique - the Daleks need to work out whether you're higher or lower than them and move in that direction, then do the same along the x axis.

Odds are your moving foes are going to have to act intelligently



They're asteroids - bad things that don't give a toss who you are or why you're there. Hit them, however, and you're dead.

second, that the sprite is supposed to be displayed for. If you're using images 10 and 11 as your frames, and sprite 1 as the



player, the command looks like this:

```
ANIM 1,*(10,15)(11,15)1*
MOVE X 1,*(0,0,0)*
MOVE Y 1,*(0,2,4)*
```

Okay, I tried to slip the **MOVE** command in there, but you noticed. It works in very much the same way as the **ANIM** command, but uses three parameters - the step time (again, in 50ths of a second), the number of pixels moved and the number of times to move the sprite.

Already, you have a problem - those commands require strings, and constructing them could require IF

DESIGNING YOUR SPRITES

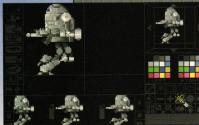
One of the first things you'll have to do is sit down with an art package or sprite designer (such as the one bundled with STOS) and design your sprites. These are the graphics that are displayed and animated on the screen, so it's worth spending some time on them - they contribute a lot to the aesthetic value of your final product.

Chances are each sprite will need several frames of animation. The spaceman featured here is my main game character, so he has eight in total. There are really only two in theory - the two different positions he assumes when he's walking - but he can walk in four directions, so you need eight sprites in total.

Each sprite is drawn on to a grid in one set of palette colours - there's a limit to the number of colours you can have on the screen at any one time (16 in low res, four in medium and two in high res), so all your sprites must use the same set. If they don't, you won't be able to display them together in their proper colours.

You'll notice that these sprites have been drawn on to a sheet of another solid colour. This is called a mask, and in my game it's ink 15. Masks are used because all sprites are essentially rectangular. If you showed a sprite with a black background, the rectangular shape would be cut out of the scenery. Instead, you give the sprites a background of one colour, and tell the sprite routine that colour is a mask ink. The sprite system makes that colour see-through, blending your sprites with the background.

Each language or authoring system has its own way of incorporating sprites - STOS has a separate program especially for designing and saving sprites in a suitable format. GFA SpriteWorks, along with most C and Pascal sprite engines, requires you to load your screen file and pick off the sprites manually, then save them out as a binary file.



These elusive spaceman sprites on the screen. Note the pink background to the sprites - that's the mask ink.

STOS provides its own fully featured sprite designer.

PALETTE SWITCHING

10	11	12	10	11	12	10	11	12
10	11	12	10	11	12	10	11	12
10	11	12	10	11	12	10	11	12

If you want to save processor time (and memory), you can achieve some visual animation effects using palette switching. Let's say, for example, you used an overhead view of a conveyor belt. Instead of drawing three separate animations, one for each frame of movement, you could draw one, built up from solid stripes of colours 10, 11 and 12.

When your game is running, the second two inks

are set to the background colour and the first is a darker stripe, as shown above. To create the effect of movement, all you need to do is set the first ink to the background colour, and the second to the darker stripe. Next, make the third ink the darker stripe. Instead of displaying new sprites and wasting time, you've simply swapped the inks around – a much quicker operation.

● **Pseudoc:** The ghosts in Pacman don't care where you are, they just wander around at random. Logically, Pac was a snake with an invisible tail – when a ghost wandered over the tail, it'd follow it until it killed you. There are other tricks of simple decision-making that can make an enemy seem intelligent – the Galaxian will wobble around at the top of the screen until you're in the right spot, at which point it screams 'Banzai!'

● **Chess:** You could go in for serious computerised thought and problem solving on the enemy's behalf, but you'll

never manage it without serious slowdown.

● **Ignorant:** If this is your first game, go for the cop-out option and fill your levels with wandering monsters that follow their predefined path, not caring who you are or whether they've hit you. The butterflies in Boulderdash are a good example.

Once you introduce the enemy sprite, you have to worry about collisions

Enemies

Of course, moving an enemy sprite uses exactly the same techniques as moving the player does. Once you introduce the enemy sprite to the equation, though, you have to worry about collision detection. Did you just bump into

that monster from Cygnus?

There are three ways to check for sprite collisions:

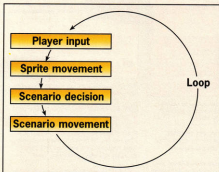
- **Use a package-specific system:** STOS comes with a perfectly serviceable *collides* command. You specify two sprites and obtain a flag result (a yes or no) which tells you whether they're touching.
- **Check for pixels under your sprite:** This option works best if you've written your own machine code sprite system and your game takes place on a blank backdrop. Simply check whether the player's sprite overlaps pixels of any other colour.
- **Use maths:** If you don't have an

automatic collision detection system, you can emulate one by working with the sprite's location (the top left corner represented by *ax* and *ay*), width and height (*aw* and *ah*). Look at the other sprites on the screen in turn (using *sx*, *sy*, *sw* and *sh*), and check whether *ax* is anywhere between *ss-tx* and *ss+sw*. Next, check whether *ay* is anywhere between *sy-th* and *sy+sh*. Confused? See the diagram on the opposite page.

And loop

At this point, your main engine folds back in on itself – you jump back to reading the player's input. This feature folds in on itself, too – short of going through the hundreds of game-specific features and how to code them, there isn't much more we can tell you.

This feature is only an introduction, mind, because the majority of the thinking is up to you, the programmer. Should you possess both the stamina and mental instability to create a finished game, I look forward to reviewing it in a future issue. Until then, get coding – and try to remember that this is actually supposed to be fun. *sf*



Games are very simple, really: you just go round and round this loop until the player wins or loses. Then you go back to the beginning, and go round and round again.

SCROLLING

If you're writing an explorable game with levels that are bigger than the screen, you'll need to scroll the backdrop as the player reaches the edge. The alternative is to use flick-screens, which involves clearing the whole screen and drawing the next one, then moving the character to the opposite edge. This is perfectly acceptable, defining the gameplay for titles like Prince of Persia, but some games need to scroll smoothly.

Scrolling is a fairly simple, but it takes enough processor time to slow your game down. If this happens you'll need to revert to flick-screens, or find a new scroll routine. The third option is to reduce the size of the area that

has to be scrolled – the larger the screen, the longer it takes. STOS users should find the *scroll* command adequate; other systems have their own solutions.

If you want to scroll the screen down by 16 pixels, for instance, you'll need to copy a block 16 pixels shorter than the scroll area's size from the top of the screen to the bottom. This will leave a gap (still filled with the old information) at the top of the screen, which you can fill with more background. You'll also have to move every sprite on the screen downwards by sixteen pixels, adding any new sprites to the top of the picture as you remove sprites that are now hidden at the bottom.