ST *APPLICATIONS*

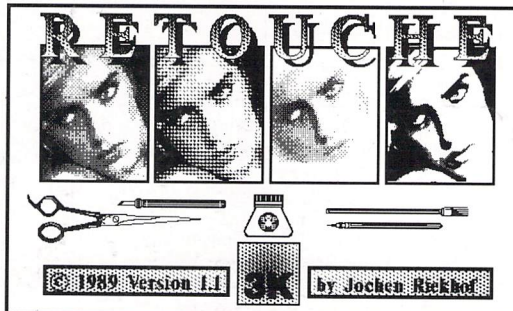## Plus PD Update

4-page Supplement on the latest PD disks starts on Page 29

Hardware

Derryck Croker looks at some of the upgrade paths for your ST, while Paul Rossiter explains the ins and outs of your disk drives.

Image Makers

with RETOUCHE

Two rather different approaches to graphics manipulation are represented by Retouche from Germany and Touch-Up from the USA - the latter reviewed as part of the Migraph hand scanner package.

and TOUCH-UP

Mastersound 2

A sound sampling cartridge and software at a price that is too good to be true? Find out in Michael Baxter's review in this issue.
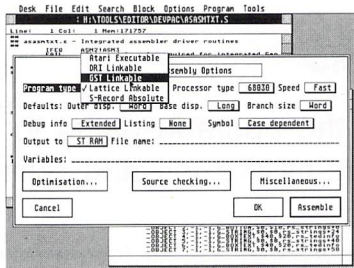
DeskJet Refills

Ink cartridges for the Hewlett Packard DeskJet printers are not cheap: is there an alternative? David Smith tries out a couple of ways of re-cycling them.

HiSoft News

All the latest news and product information.

DevpacTT, now!

HiSoft Devpac TT, the complete assembly language development system for your Atari TT computer, is now available.

Comprising a multi-window editor, a 680x0 macro assembler, a fast linker and a powerful symbolic debugger, Devpac TT provides you with all you need to program efficiently and quickly on the TT. Features include:

Editor

- Full multi-window support with cut and paste between windows and pop-up menus
- Up to 9 tools give a complete visual shell
- Environment variable support
- Powerful non-ASCII character pop-up to allow unusual characters to be entered using the mouse from the editor and within dialog boxes

- High speed search algorithm capable of searching more than 1Mb per second
- Nine bookmarks to remember arbitrary points in the source text of any window
- Support for mouse block marking complete with shift-clicking, word and line orientated marking as well as 'click and drag'.

Assembler/Debugger

- Many directives and optimisations to exploit the 68030/68882
- Extended command line support with optimisations, options and variables all accessible from the command line
- Support for DRI, GST, Lattice format linkable code, Atari executable format and Motorola S-Records
- Assembly of 68030/68882 code at 200,000 lines per minute
- Fully TT compatible debugger with support for 68030/68882 and the TT screen modes
- The debugger contains all the features you would expect: multi-windows, conditional breakpoints, full expression evaluator etc.
- Utilities include a Ramdisk, S-record splitter and debug information splitter.

Devpac TT comes complete with a 300-page, ring-bound manual. Also included is the official Motorola 680x0 family Programmer's Reference Guide which gives complete instruction details for the 68030/68882 etc.

HighSpeed Pascal

We have recently discovered a brand-new, and rather exciting, version of Pascal for the Atari ST and TT computers.

HighSpeed Pascal comes from Denmark, is extremely fast and friendly to use and is very closely compatible to the immensely popular Turbo Pascal on the PC, even including the graphics unit from the PC.
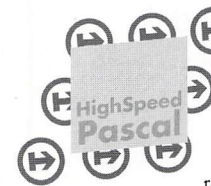
Compilation speed is roughly 20,000 lines per minute with excellent code generation for the ST and the new TT.

HiSoft has been appointed the exclusive distributor of HighSpeed Pascal in the UK, USA, France, Australia and New Zealand. RRP £89.95. Exisitng Personal Pascal users can upgrade to HighSpeed Pascal at a reduced price - please call for details.

ProFlight 1.2

We are pleased to announce the release of version 1.2 of ProFlight, our immensely popular Tornado flight simulator, loved by reviewers and users alike.

This new version of our Tornado flight simulator includes improved colour graphics, the ability to save your cockpit set-up, a pause key, more control over the view angle and more … it even works on the TT!

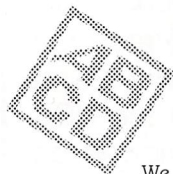Registered users can upgrade by sending their master disk back, together with £2.50.

Wordflair News

We are pleased to announce the immediate availability of the UK version of Wordflair, the integrated document processor.

With its powerful combination of text, graphics and calculation regions together with its integrated database, Wordflair is ideal for newsletters, product brochures, form letters, mail shots etc.

Wordflair provides all of the features you need for efficient word processing … and much more. Wordflair lets you combine text, graphics, and images, with its easy-to-use page layout tools. in addition, you can dynamically link calculations and data throughout your document, giving tremendous flexibility and power.

Many of you will of heard of a new version of Wordflair - Wordflair 2. The US version of this package has just been released in the States and we will have the UK version available in May 1991. Some of the important features of this new release are the inclusion of a spelling checker, a thesaurus and FSM GDOS, which is based on outline fonts, giving much improved display and printing of fonts.

The RRP of Wordflair 2 will be £99.95, initially, and the upgrade price from Wordflair 1 will be £39.95. If you use the coupon below and order before 1 May 1991, you can obtain Wordflair 1 for the special price of £59.95. So why not experience Wordflair now and then upgrade without it costing you a penny more?

Use this order form to obtain your HiSoft Software directly from HiSoft and we will send you a Starter Pack consisting of a quality mouse mat (printed with the ST ASCII set), an attractive disk wallet and 4 double-sided disks, totally free of charge!

	Product	Price
❏	**HiSoft Devpac TT**	£129.00
❏	**Wordflair - *special price***	£59.95
❏	**HighSpeed Pascal**	£89.95
❏	**Lattice C Version 5**	£149.00
❏	**HiSoft DevpacST 2**	£59.95
❏	**HiSoft C Interpreter**	£49.95
❏	**FTL Modula-2 Developer**	£99.95
❏	**Power BASIC 1.3**	£49.95
❏	**Harlekin**	£49.95
❏	**TurboST 1.83**	£34.95
❏	**HiSoft KnifeST**	£29.95
❏	**ProFlight**	£39.95
❏	**Tempus 2**	£39.95
❏	**Your 2nd Manual**	£14.95

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CONTENTS

Read_Me 1st

Subscription Expired? If you received this copy of ST Applications through the post, check the first line of your address label carefully: if it reads STA7, then either your subscription has expired with this issue or you have been sent a free evaluation copy of ST Applications. Either way, you must take out a new subscription in order to receive further issues.

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Subscription Rates

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12-issues plus 6 Disk Mags : £26.50

Air Mail Worldwide:
12-issues : £28.00
12-issues plus 6 Disk Mags : £34.50

Subscription and Order form will be found on page 57.

Disk Mags

These are bi-monthly compilations of the best PD software to come to our attention in the preceding couple of months - not magazines on disk. The next Disk Mag, DMG.24, will be dispatched a few days after ST Applications issue 8 is sent out.

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If at any time you wish to cancel your subscription to ST Applications you may do so simply by informing us in writing. The full unused balance of your subscription will be refunded by return of post.

CREDITS

Contributions

The articles in ST Applications are written by users for users. Everyone reading this magazine will have something to contribute; even if you do not feel able to do a full-length review or article there is the Forum section for short hints, tips and questions. If you are interested in writing for ST Applications - regularly or irregularly - please write for a copy of our terms and conditions. We always do our best to reward quality work with appropriate remuneration.

All Formats Computer Fair

Phil Trory reports on Which Computer's poor relation.

On the Sunday before the start of the Which Computer? Show (21 April), a less exalted computing event took place within a diskette's throw of the NEC. The All Formats Computer Fair was held in a three-room suite at The National Motorcycle Museum, just across the road from the exhibition site.

The displays had none of the gloss and razamatazz of the big manufacturers. Lines of tables around each room were piled high with everything, from packs of 100 screen wipes (50p), to a 25MHz 386 PC for £1500. For my two eleven-year-old minders it was a treasure trove of games at mail order prices, although the jumble meant you had to be very careful to look for the Atari ST label on the boxes.

The event is certainly a good opportunity to see what the rest of the "home" computer scene is up

to. Minority groups included stands devoted to the QL and the Z88, and a surprising number of SAM Coupés were demonstrating music, hooked up to keyboards. The big disappointment was the lack of any serious representation for the ST. Any PD library that had gone along with a box of Budgie disks would have been unlucky not to clean up, and there are a host of applications where an ST, even with PD software, could have knocked spots off any box in the room.

The entry price, at £3, with no reductions, looked high to me, but didn't seem to put off the hordes of enthusiasts, who probably figured they could save more than that from the bargains on offer. The warning, if you go next year, is either take no money at all, or be prepared to spend the lot.

Also, next year, the place will be wall-to-wall with Atari user groups and PD libraries, won't it? Come on, guys, where were you?

❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈

Kuma Books and Butler

Kuma Reads

Kuma's best selling book *'The Atari ST Explored'* (£9.95) has been extensively revised and updated by Malcolm McMahon for its second version. The new book starts with an introduction to the ST, the Desktop and GEM; moves on to cover the relative merits of Basic, C, and Assembler for programming the ST; and concludes with chapters on interfacing to the operating system and communications.

'Programming by Example: Atari ST Basic' (£14.95) by Dr Graham McMaster begins with an introduction to the operating system, program development, progressing to problem solving, graphics and colour handling, sums, simulations and speed.

Meet Mortimer

The first product to come out of Kuma's cross distribution agreement with German company Omikron is the multi-utility

package Mortimer. Dubbed a 'butler for your ST', Mortimer offers a host of utilities that are available from within most applications.

Features include: text editor available at all times; file handling facilities including copy, delete, format and create folders; printer spooler; detector for both boot sector and link viruses; keyboard macro's; dynamic RAM disk that grows and shrinks as required; screen magnifier; quick mouse; time and date display; view IMG files; and, inevitably, a calculator.

Incredibly, Mortimer only reserves 64K of RAM once installed, and its dynamic memory manager ensures that it only takes up the minimum of RAM.

```
Product:.........Mortimer
Price:.............£32.90
Supplier:........Kuma Computers
Tel:...............0734-844335
```

Atari News

The magic of £99

Most Atari distributors have retained all of their VAT inclusive prices despite the increase of VAT to 17.5%.

Curriculum Works

Just weeks after its launch the Family Curriculum 1040STE pack has taken off so well that Atari have revised sales projection upwards by 10,000 units, and now expect to sell well over 50,000 units by the end of this year.

Prices

The latest glossy brochures from Atari clarify the pricing structure on the most recent hardware. The Mega STE1 with 2Meg RAM will retail at £599; the Mega STE2 with a 48MByte drive for £899; and the Mega STE4 with another 2Meg RAM costs £999. All Mega STE's come with an SM124 mono monitor. No sign of any slipping in the price of the TT; with two, four and eight megabytes of RAM they now retail at £1995, £2195 and £2395; plus £399 for the PTC1426 monitor. All prices exclude VAT.

Wharehouse Clearance?

Pending the launch of the Mega STE, Atari distributors have cut the prices on old-style Mega hardware. The Mega ST1 now retails at £499 (was £599), and the Mega ST4 has come down from £1299 to £899; prices include VAT - add £100 for an SM124 monitor. The Stacy has overcome the problems with its battery life: Atari have removed the battery pack and no longer claim it to be a true portable. The Stacy 2 with a 20Mbyte hard disk will retail at £1499 including VAT. The new Atari SLM605 laser will retail at £999+VAT.

Megafile 30 and 60 hard disks have come down from £499 and £699 to £369 and £499. Not the fastest of drives around (65ms average access time), but they are well built and well matched to the Mega ST housing. The 520STFM Discovery pack now has a RRP of just £279. Of nostalgic interest only: you can pick up an Atari SF354 external single-sided disk drive for £59...

❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈❈

Protar U.K.

Protar's UK offices will be open for business as of the beginning of May. According to Mark Pearson, the man in charge, this is going to be a major source of good news to Atari owners everywhere. The parent company in Germany is well known around Europe as the second biggest supplier of hard discs (the biggest being Atari itself) and the British branch is looking to surpass that.

The product range starts from £295 for a 20MB disc and goes up to custom-made 440MB quantum discs with an access time of 19ms, as well as including tape streamers to allow for easy back-ups. The construction is designed to fit in with the standard Atari style (grey) and they will happily take the weight of a monitor.

Speaking of monitors, Protar are also offering a 1280 x 1024 19" monitor for the TT and are intend-

ing to market a card with it so that it can be used with the standard ST. The monitor retails at £675.

Not content with just providing the products, Protar are also intending to construct a dealer network to support them, and are promising to replace any defective product within its warranty period rather than repairing it.

```
Protar can be reached at:
Park House,
Greenhill Cresent
Watford Business Park
Watford
Herts.
WD1 8QU
Tel: 0923 54133.
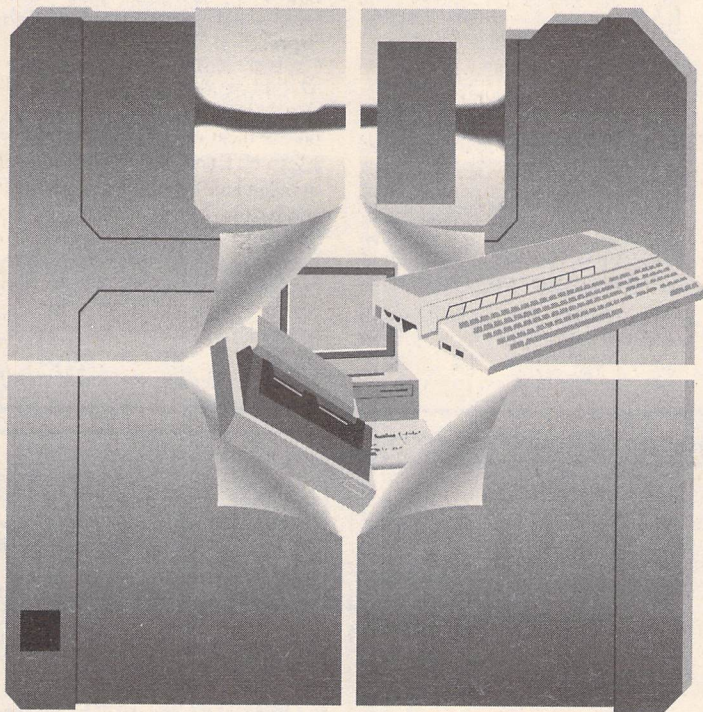```

Piper

# News In Brief

### Europress Newname

ST User publishers Interactive Publishing, previously Database Publications and incorporating Gollner Publishing, have re-named themselves Europress Publications. As a part of the same re-branding exercise, Database Software (Fun School and Mini Office) and Mandarin Software (STOS) will go under the banner Europress Software.

### PCG Fonts

Additional fonts for Calamus, PageStream and Fleet Street Publisher 3 are available now from PCG. Four sets of fonts are available: Pack 1 (£39.95) is a set of four calligraphic and Gothic faces; Pack 2 (£29.95) is a set of four extra bold faces for headlines and the like; Pack 3 (£29.95) comprises four exotic fonts; and Pack 4 (£24.95), The Standards, is a full set of Swiss and Times faces with true italics, bolds, and bold italics. PageStream users, in particular, will find the Standards set ideal replacements for the poor Tymes and Helv supplied as standard with PageStream. Full details and illustrated flyers from PCG, 11 Marsh Street, Barrow-in-Furness, LA14 2AE; Telephone: 0229-836957.

### Atari TT

Unix 5.4 is reportedly very close to launch. Complete with a 210MByte hard disk it will retail in the USA at $1600; a complete Unix workstation based on an 8MByte TT with a large screen monitor, Unix and the 210MByte drive will retail at $4000. TT RAM upgrades are now available at $1400 per 8MBytes.

### ST World

From the June issue, the next three issues of ST World will be bound free with ST User. At the end of this test period Europress will decide whether ST World will continue as a magazine in its own right. ST World is being edited by ex-Stuffed Disk Magazine editor Marc Young, who is also taking over as technical editor on ST User. Marc has a long pedigree with the ST: he used to write for The ST Club Newsletter, and so is well placed to stem the tide of crass clangers from Europa House.

### Show Dates

The Fourth International 16 Bit Computer Show will take place between July 12th and 14th at the Hammersmith Novotel. The next All Formats Computer Fairs will be at the National Motorcycle Museum near Birmingham on June 9th, and London's New Horticultural Hall on 22nd June. Many more provincial shows are planned by Bruce Everiss; more details on 0926-640137.

The Leeds Computer Extravaganza will take place at the Leeds University Exhibition Centre between 13th and 15th September. More details from Capital North Ltd on 0532-677657. Atari have had a change of heart over the Computer Entertainment Show, and will be taking a 224m² stand at CES '91 in the first week of September.

### Micro French

Encouraged by Atari's decision to bundle their Primary Maths and Micro Maths packages with the new Family Curriculum Pack, educational software publishers LCL are planning to launch more packages for the ST. The first of these is Micro French ST Plus, a complete re-write of Micro French. As a complete written and spoken course, the package comes with 24 programs, a book, audio tape and an instruction manual. More details from LCL on 0491-579345.

### MasterCAD

Microdeal have re-launched their 3D drawing package MasterCAD. Developed by INDI in Venezuela, Master CAD originally retailed at £150: at the new RRP of £29.95 it represents excellent value for money. More details from Microdeal on 0726-68020.

### Network News

We were saddened to hear of the untimely death of Peggy Shean, wife and business partner of Frank Shean at Network News Services. Under the circumstances Frank Shean is currently unable to provide the usual level of round-the-clock service to his customers. The NNS nationwide contacts and outlets are, of course, still up and running and prepared to offer all of the full range of NNS services; staff at the NNS print works in Tilbury are handling all sales queries and orders as usual.

# Mastersound 2

Review by
Michael Baxter



Mastersound 2 main editor screen. The box in the right hand corner of the display is the real time oscilloscope used to set the input volume.
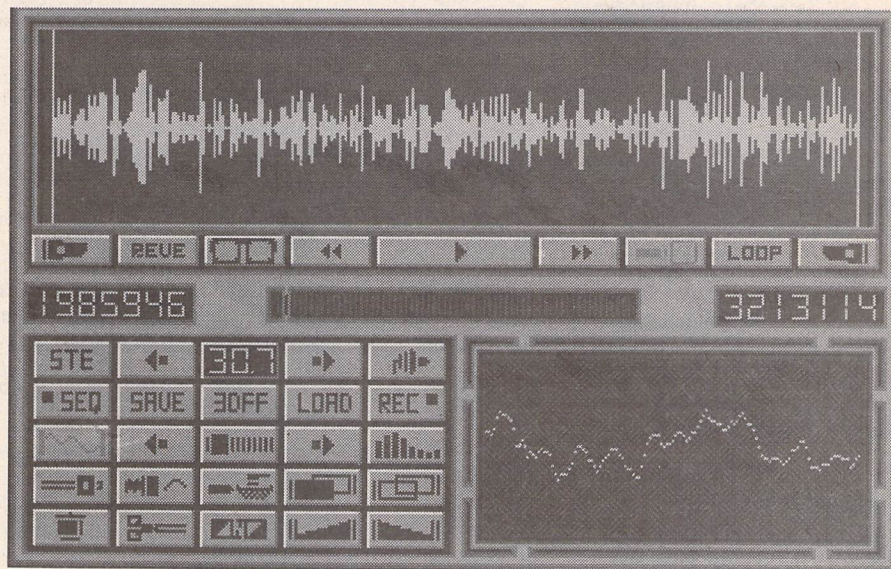
*Sound samplers have been with us almost since the dawn of the ST. The ratio of price against performance has constantly been swinging in favour of the end user, and gone are the days when a primitive sampler would set you back £100 - we have now reached a point where genuinely good quality sampling is available at a resonable price. As such, Microdeal's revamped Mastersound 2 promises much at a price that seems too good to be true...*

Designed and written by Audio Visual Research, who are also responsible for the Replay 8/Professional series, this package could be considered as a cut-down version of existing Microdeal samplers. It is clearly designed to be an introduction to sound sampling, but as such boasts a surprisingly large array of features, including some that will be found in few other packages at this level.

The Mastersound 2 package consists of one standard ROM cartridge, a single-sided disk containing the sample editing and demonstration software, and a competent 36-page manual which manages to cover each feature of the software with the minimum of fuss. There's also a section devoted to explaining the mysteries of AVR sample data format and how to use Mastersound samples in your own Basic programs.

The first noticeable difference between Mastersound 2 and its Replay stablemates is that the sampling cartridge only has an input socket, so unless you own an STE or a copy of Microdeal's Stereo Playback cartridge, samples can only be played through the ST's sound chip and monitor speaker. The next source of annoyance comes from the editor

software, which only runs in low resolution. Aesthetically, however, the editor has the 'sexiest' front end to be found on any current ST sampler, with electric-blue sample, oscilloscope and spectrum displays, and metallic effect bas relief control buttons.

Thankfully, all this graphical overkill is matched by an equally impressive specification, and unrivalled ease of use. Mastersound 2 accepts its input from a 3.5mm jack socket which is plugged into the headphone socket of output devices such as compact disc players, cassette decks, etc. No suitable lead is supplied with the system, so if you can't make one, a trip down to your local electronics shop is in order. Capturing a sound sample couldn't be much easier - simply set the sample rate, and click on record. Press the space bar to stop recording, and voilà: you have a digital sample which can be manipulated in all sorts of interesting ways. Of course, it doesn't have to be as simple as that, and Mastersound 2 has some handy features which allow you to make the most of the hardware's sample range. A real-time oscilloscope allows you to set the optimum input volume level. The editor also as an auto trigger

option with adjustable sensitivity. There's also a 3D Fast-Fourier Transformation display, and a funky 36-bar spectrum analyzer which monitors the frequency content of the incoming sample.

## Editor Functions

The editor has plenty of manipulative functions which allow you change any part or all of the sample currently held in memory. Most are self explanatory, but some deserve a special mention, such as the overlay function, which allows you to superimpose one sample on top of another together. Using this function, creating an echo effect is a piece of cake. Hard and soft filters are supported which can make samples sound less tinny. The software also allows you to shrink samples to half their original size, which also causes the sample frequency to be halved. For example, if you sample at 30Khz and then shrink it to 15khz, the new sample will generally sound better than if you originally sampled it at 15khz.

## Sequencer

The inclusion of a sequencer really puts this package several steps

higher in the ratings. You can load up to eighteen samples into memory simultaneously, and then play them back by tapping out a rhythm on the computer's keyboard. At the same time, the computer will record the sequence in real time. Any mistakes can be rectified by locating the problem area and then re-recording from there. Samples can be played back at different pitches, and can be stuttered, producing those famous "N-N-N-Nineteen" effects. Once you're happy with the sample sequence you can save it to disk and create a demo sequence with graphics and text using the supplied software.

## Midi Support

Samples can be played over a two octave range via midi using a suitable midi device (keyboard, drum machine, external sequencer), on any channel number.

## Quality

Mastersound 2 can sample at up to 30.7Khz over eight bits in mono. This obviously falls far short of CD quality, which is 44.1Khz over sixteen bits in stereo. But c'mon, what do you expect for forty quid? Even using a compact disc or a metal tape recorded with Dolby C noise reduction as the sound source, Mastersound 2 still manages to pick up background noise, something which must unfortunately be attributed to the budget nature of the hardware. Using the software filters (or an external amplifier's filters - STE owners only) goes some way to alleviating the problem.

## STE Support

Mastersound 2 fully supports the STE, both in playback and sampling. Using the STE options allows you to adjust bass, treble and volume settings, and use the built-in DMA output sound capability, which requires no processor time. The slight downside of this is that sample frequencies are set at the system limit of 6.2, 12.5 or 25.6 khz.

Points For:

✓ Exceptionally good value for money.
✓ Very easy to use.
✓ Sequencer is powerful, and until very recently unmatched by any software of comparable price.

✓ Well written manual.

Points Against:

✗ Only runs in low resolution.
✗ Some of the control button icons are a bit obscure.
✗ No audio output socket.

Conclusion:

Overall, I'm very impressed with Mastersound 2. It is the perfect introduction to sound sampling on the ST, and as far as most ST users needs go, I'm sure it is quite powerful enough to hold off the desire for a more upmarket package for quite some time. Definitely recommended.

## The Competition:

If you are looking for a budget (sub £50) sound sampler for your ST, your choice is currently limited to two other packages:

DAATASound - £39.99 - Pandaal Marketing, Tel: (0234) 855666. This latest entry to the ST sampler market is also being pitched as an entry level sampler. The editor has comparable features to Mastersound 2, as well as an accurate 18 sample sequencer and real-time echo mode. It also has full STE support, and will run in all three screen modes.

Maximum sample frequency is 25Khz over 8 bits in mono. Stiff competition for Mastersound 2.

ProSound Gold - £49.95 - Power Computing, Tel: (0234) 273000. This ageing sampler also boasts flashy front end graphics, and has good editing features. Will not work with a Mega ST owing to poor case design. No STE support. Maximum sample frequency is 30khz over 8 bits in mono.

| | |
|---|---|
| Product: | Mastersound 2 |
| Version: | 2.0 |
| Price: | £39.95 |
| Supplier: | Microdeal |
| | PO Box 68 |
| | St. Austell |
| | Cornwall |
| | PL25 4YB |
| Tel: | (0726) 68020 |
| Fax: | (0726) 69692 |
| Manifest: | ROM Cartridge, 1 Single-Sided Disk, 36-Page manual. |
| System: | ST/STE, Colour monitor. Usable with 512k, but as with all samplers, the more memory you have, the better. |
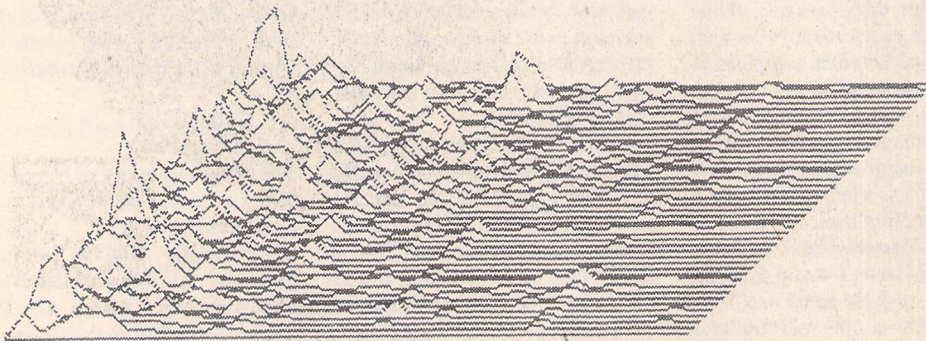


PRESS ANY MOUSE KEY TO EXIT

Left: The Mastersound 2 Fast-Fourier Transformation screen.

Bottom left: The Sequencer control panel.

Bottom right: 36 Bar Spectrum Analyzer display.

# Introducing
# Atari ST
# Machine Code

## Reviewed by Jon Ellis

*In the past, programmers wishing to learn assembly language from scratch had to make do with books which make no reference to the ST. The latest release from zzSoft, publishers of the budget DTP system Easy Text Plus, should dispense with this added difficulty. Their book and double-sided disk package "Introducing Atari ST Machine Code" contains a practical introduction to programming the ST in assembly language, along with all the software needed to get started.*

Unlike some disk and book packages, where the disk simply reproduces what is in the book, the zzSoft disk contains a full suite of programs suitable for the novice assembly language programmer: an editor, assembler, linker, resource construction program and debugger. In addition, the disk contains all the major source code examples printed in the book, assorted documentation and utility programs. In order to pack all this onto the disk, much has been archived using ARC. Both ARC and a suitable shell from which to drive it are also included. Single sided disks are available on request by returning the disk to zzSoft.

## The Book

This represents quite a triumph for home publishing. According to Roger Pearson, the principal author of the book, the master copy was produced in its entirety on a 2 Meg Atari and a Panasonic laser printer. This was followed by professional printing and binding, producing a creditable result. My first impression, that the binding might be inadequate, turned out to be unfounded; despite some fairly intensive use, the review copy has proved to be quite rugged.

The theme of the package is laid out clearly in the Introduction: a practical introduction to the subject of application programming in assembly language on the ST. Rather wisely, the authors do not promise instant mastery of the subject, but an introduction to the basics, sufficient to show what can be done and perhaps to instil an enthusiasm to investigate further. The philosophy of the package is very much 'learn by watching', by examination of annotated examples. Valuable as this is, the inclusion of some exercises for the reader ('watch, then do') would

certainly aid in the learning process. Naturally, answers for any such exercises would have to be supplied.

Chapter 1 begins with a short discussion of the mechanics of developing an assembly language program. It continues by presenting a short 'print the letter A on the screen' program, akin to Kernighan and Ritchie's classic 'Hello world' program. This is then dissected line by line to illustrate various points. Unfortunately, this approach does create problems: one is faced with having to explain what 'move.w #65,-(sp)' does, to a user who might have no concept of either a stack or a register. Also, this brings in operating system functions and their attendant protocols for use. This leads to explanations which continually refer to other chapters, or worse, which use phrases like *Because that's the way it's done!*.

One can understand the desire to provide the user with something executable as quickly as possible. However, I cannot

help feeling that it would have been less confusing to have started by discussing fundamentals such as registers, data representation and addressing modes, perhaps illustrating this with an abstract example, such as adding two numbers, before attempting to use the trap mechanism.

Despite this approach, Chapter 1 does contain important explanations of stacks, binary representation and two's complement arithmetic. On the whole, these are well done, but marred by occasional imprecisions which the user will have to unlearn later: *'Decimal data is prefixed with a hash, eg #65'* (p.10) - it is immediate data that is so prefixed, regardless of base. The examples seem to mix hex and decimal freely, so alert reading is required.

In Chapter 3, the basic operation of the debugger is discussed, and more features of the 68000 such as supervisor and user modes, and the status register are revealed. Once again, occasional explanations are misleading: (p.29)

ds.l 1 is not *'exactly the same'* as ds.b 4 owing to the word alignment of the former. This is potentially serious as address errors (caused by accessing words or longs from odd addresses) are common pitfalls while learning assembly language.

The book continues, introducing further assembler directives, 68000 opcodes and TOS functions while producing more and more advanced programs. This progression is nicely judged, with a constant supply of new features to keep the reader thinking. On the whole, the explanations are good, but there are odd lurches into incomprehensibility which could have been caught by more thorough proof-reading. In particular, the description of the BSS segment as a place to store *'unitialised (sic) data, i.e. data that may not necessarily be empty of data'* (p.39) is rather perplexing. Similar examples of obscurity may be found on pages 34 and 44.

The first third of the book concludes with useful chapters on reading disk files from assembler, screen layout and disk formatting. These are good examples which show how quite complicated tasks can be approached and solved with assembly language programs. At this stage, the reader should have learnt enough to write some useful small programs, and should probably do so before diving into the largest section of the book, which details how to access GEM from assembly language.

In this section (chapters 10-21), the authors provide an excellent introduction to using GEM, including GDOS (traditionally a neglected subject in ST programming books). Whilst this could not really be recommended to a complete novice, a programmer with experience of using GEM from a high level language should find it very useful. All of the GEM

examples contain a constant piece of start-up code to perform the memory management: unfortunately, this is not properly explained, as the subject of the basepage is not addressed. Resource handling, windows, dialogue boxes, menus and desk accessories are all presented with examples, in a form which will allow easy customisation of the code.

There is also a chapter on interfacing assembly language routines to GFA BASIC programs. Whilst I don't use GFA, and therefore cannot comment on the accuracy of the code, I am sure that many potential buyers of the book will find this extremely valuable.

The book finishes the programming section with a flourish: some code samples to solve some well-known problems on the ST. Booting from drive B and allowing GEM programs to wait for either mouse button are just a couple from the excellent miscellaneous chapter.

At the end of the book are some chapters on the use of the editor, assembler and debugger programs that appear on the disk. Intuitively, I had expected to find these details of how to use the system near the beginning of the book. These are well enough written, although still plagued by annoyingly incorrect asides: *"This type of program [TTP file] is often produced by C compilers as they produce this type of file almost by default"* (p.372).

Following this is a bibliography and a useful appendix of keycodes. The book ends with a glossary and an inadequate index. In a book where so much of the information is scattered, a weak index is a serious flaw. In particular, not all of the 68000 opcodes have an entry, neither do standard 68000 concepts such as 'effective address'.

### The Disk

zzSoft should be congratulated for this collection of software: on one disk they have collected everything that one needs to begin programming in assembly language. It is perhaps a sign of the maturity of the ST market that so much of this is public domain: a symbolic debugger from the Sozobon suite of PD software and the PD MKRSC resource editor from J Charlton in Canada. The editor, assembler and linker are written by zzSoft. The disk even includes

a minimal GDOS set-up for the chapter on programming with GDOS, and the popular PD Eternal reset-resistant RAMdisk.

Installation of a floppy system is detailed in a README file on the disk. I copied the files into a folder on my hard disk, and this seemed to work until I tried to assemble a program. The linker kept warning of possible truncation of the output file and the file created was wrongly named (e.g. BL instead of BLIT.PRG). It ran happily after being renamed. Running the package in the root directory seemed to sort out the problems.

The editor serves a dual function: firstly the creation of source files, and secondly as a shell from which to assemble, link and debug programs. As a full screen text editor, it has all the basic functions that one would expect: simple block handling, search and replace, insertion of file, etc. The GEM presentation is fairly standard, although the program only allows the editing of one file at a time. The screen handling is acceptable, if not blindingly fast. Keyboard shortcuts are provided for most functions but are not programmable. It would have been nice to be able to tie some of the common operations to function keys (e.g. make 'Delete line' work from a function key rather than the cumbersome Control-Y). Also, the undelete function could have been bound to the UNDO key as well as to Control-U. The operation of the replace feature was rather odd: the strings to be searched for and to replace with have to be set up with one menu selection, before the replace operation is started with another menu option. Having said that, the replacement proceeded rapidly.

My only substantial reservation about the editor lies in its built-in restriction: a maximum of 1000 lines. This is inadequate. It is most frustrating on a 4 Meg machine to be told that a 50K file cannot be loaded because it is too big for the editor's buffer. This short-coming is rendered more acute by the failure of the assembler to support the inclusion of header files.

Where the editor really scores is in its role as the shell for an integrated development environment. With a couple of clicks or keystrokes, the file held in the text editor can be assembled and linked into an executable program, which can then be run from within the editor. Access to the

debugger is also available. Chaining between the various programs in the package is accomplished smoothly in most cases. However, I was able to cause a bus error by altering the path to assemble to.

The assembler is perhaps the weakest program on the disk. While it performs its functions with an acceptable turn of speed, it suffers from some rather frustrating limitations. It does not accept short branch opcodes (e.g. bne.s), nor does it allow constants to be represented as ASCII characters (one must use #65 rather than #'A') or in binary. The last two are significant: surely when learning a language, one should be able to represent data in the way which best reflects one's intent, rather than have to work around the software's limitations. The failure to support binary data leads to the ridiculous situation where the book contains one example program which is printed twice: once in a form that displays its function clearly, but which cannot be assembled; and a modified version to feed to the assembler. The assembler is also annoyingly case sensitive in its interpretation of directives, of which only a small set are available. In conclusion, the assembler suffices for the task in hand, but will be quickly outgrown.

The debugger is a rather different matter: derived from the UNIX adb tool, it provides a reasonable amount of power, but with few gestures towards usability. I have a feeling that it does not provide an easy introduction to the arcane practices of debugging, but its presence is welcome. Those who buy this package and then graduate onto Hisoft's DevpacST will really appreciate the facilities of MonST! Two text files provide detailed documentation.

The resource editor allows the construction of basic dialogue boxes and menus with ease, doing away with the necessity for laborious hand-coding techniques. In style it reminded me of the old Megamax Resource Construction Tool. The program is provided with a documentation in the form of a text file on the disk. Icons and bit images are not supported, but this is not a severe deficiency for a learning tool. However, the program does not exit gracefully when it comes across a resource file containing such objects: trying to view MKRSC's own resource file provoked a crash! The editing area is also a little restricted in size.

The disk also contains four important large text files, three detailing AES, VDI and TOS function usage, and the last containing an incomplete list of 68000 opcodes, which are illustrated with examples. I cannot help feeling that this list could have usefully been incorporated into the book, as I am sure that one of the first things a purchaser will do is to print it out.

### Conclusions

This product fills a gap in the market and does so well. Anyone thinking of learning assembly language will find the book and disk a good, albeit selective, introduction to the subject. To extract the most benefit, perhaps a more comprehensive book on the 68000 should be purchased as well. *"Programming the 68000"* by Steve Williams (1985, Sybex; ISBN 0-89588-133-0) covers the material from a machine-independent viewpoint and has an easy to use reference format. Recommended.

**Points For:**

✓ *Excellent value for money.*
✓ *Everything needed to get started.*
✓ *Lots of examples to learn from.*

**Points Against:**

✗ *Limited functionality of the software.*
✗ *Occasional mistakes in book.*
✗ *Poor index.*

Product: .....Introducing Atari
 ST Machine Code
Version: ......First edition
 (December 1990)
 with updated disk
 (17/03/91)
Supplier: .....zzSoft
 3 Riverdale House
 Mytholm Close
 Hebden Bridge
 West Yorkshire
 HX7 6BP
Tel: .............0422 845528
Price: ..........£21.00 inclusive
Manifest: .....Book: paperback,
 405+x pages;
 Disk: 606K used
 out of 728K
System: ........Any ST/STE.

Reviewed on 4 Mb ST with TOS 1.4, hard disk and mono monitor.

# Touching Up
# The Greys
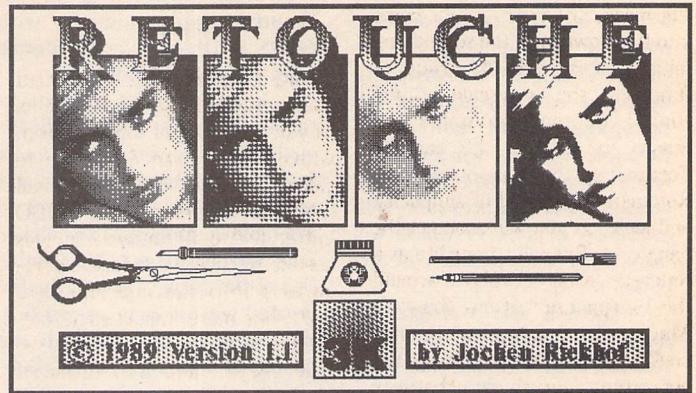
## With *Retouche*

Günter Minnerup

*As explained last month, the vast majority of scanners available for the ST may claim to support 16, 32, or 64 greys, but in reality they are monochrome devices which translate the different levels of intensity into "dithered" patterns of black dots in the same way as the Atari monochrome monitor, for example, does. Given that very few ST owners indeed have access to a true greyscale scanner, the news that greyscale editing software is now available in the shape of the German import Retouche may leave readers of ST Applications rather cold. Fancy high-end stuff, of little practical use to the average punter?*

Rest assured that Retouche is accessible and extremely useful to users of even the cheapest scanners around. Not only can it import Degas and Neochrome colour pictures, but it comes bundled with IMG2TIF, a conversion utility that will, as the name suggests, translate dithered IMG files into greyscale TIFF format ready for the main program. You have a choice between conversion to various numbers of grey levels: the more greys, the smaller your picture becomes (losing detail when later rescaled to its original size), so do not go overboard. Although Retouche works with up to 256 greys internally, it cannot display more than 64 on a monochrome monitor, and there is little point in choosing more grey levels than the original scan ever contained. Another consideration is output resolution: for dot matrix and laser printers, 16 greys is usually sufficient and preserves more detail than 64.

## Tools

The conversion out of the way, it is time to look at what Retouche has to offer in terms of editing facilities. Remember what was said last month: with this sort of software, you are not working at pixel level, but at greyscale level. This requires a radical rethink for anybody used to traditional bitmap paint software, and your first practice sessions may well be frustrating, despite the excellent tutorial and the many sample pictures supplied.

A photographer would find easier and more intuitive access to at least one of the three main groups of functions: those that are concerned with global effects such as sharpening, softening, brightness and contrast and so on, as they are akin to camera parameters such as exposure, focus, and the use of different lenses. These are used mainly to correct basic faults in the picture, and can be relatively slow on the ST's 68000 processor. Waiting a few minutes only to find that the effect is not the desired one can be annoying but Retouche always holds two versions in memory simultaneously, so with most functions the original can be restored again by simply pressing the UNDO key.

## Mask

Another important help with these global functions is the mask. Using the masking tool to cover sections of the picture in black (or selecting certain greys for automatic masking) will restrict the effects to the remaining parts, thus saving both frustration and time. The mask can also be inverted, and monochrome .PIC graphics can be imported as masks.

Both the UNDO buffer and
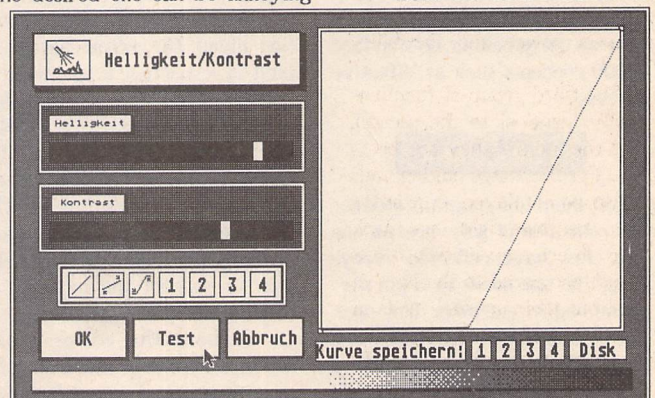
Also known as a 'gamma curve', the brightness/contrast controls allow fine adjustments to the representation of the different available grey levels in the picture. Here, both contrast and brightness have been adjusted with the slider controls to produce a steeper and more 'stunted' curve - with practice, you can achieve the same by drawing directly into the curve window.

the mask, however, really come into their own with the second and initially most difficult group of functions: the greyscale editing tools. The more complex the image, the trickier this can be! Fortunately, the user interface of Retouche is a model of simplicity and logic, so you will soon get the hang of it. Basically, your life as a touch-up artist revolves around the two mouse buttons (how do Mac users manage with only one?): the left button being the pen, stamp, brush or whatever tool you have selected, the right button the eraser. All you really have to understand is the key role of the current background colour, which can be any of the up to 64 greys selectable from the palette or "picked out" from the actual image -the editing tool (the colour of which is selectable in the same way) will work only on that background, or areas darker or lighter than that background, or on all areas. Get it? So you can freely drive your pen all over your precious image, secure in the knowledge that it will only affect the parts that ordinary drawing programs could not reach - at least not that selectively.

## UNDO

Before any such operation, it is wise to copy your image to the UNDO buffer so that mistakes can be easily rectified. The eraser can also be used as a partial UNDO, replacing everything in its path with the corresponding part from the UNDO buffer. The two picture buffers can be combined in ways that are far more flexible than the usual AND, XOR, OR boolean logic offered by ordinary paint programs. Add the mask to this, and you get some idea of the enormous power and flexibility offered.

The third group of functions is really identical to the second, except for the use they are being put to. For the image editing tools can also be employed as painting tools in their own right, on a blank canvas. There may be only a few of them, compared to the likes of Degas, but their unusual mode of operation and configurability offer effects that were previously unthinkable: like painting over only selected tones of grey, charcoaling with subtly different amounts of pressure, and brushing with different degrees of "wetness". Not much use for pixel-precise technical drawings, but great for creating fantastic landscapes!

## Print

Finally to print. This is handled rather awkwardly by Retouche, as you cannot print directly from within the program but have to call an accessory. The rather small (640*400 or, including the UNDO buffer, 640*800) Retouche images need to be enlarged before exporting as an IMG files or printing on a laser, but more importantly, they need to be rastered to convert the true greys back into dithered black dot patterns. To help with this, Retouche will let you switch the screen display to different dither patterns before choosing one for output, and there is a further accessory for creating and editing customised output rasters (for different screening angles and effects). All this takes some trial and error, but gives a high degree of control over the output. For what would be the point of all that subtle image editing if the results then got lost in a mass of ill-arranged printer dots?

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### Details

| | |
|---|---|
| Product:........ | Retouche |
| Version:....... | 1.1 |
| Price: .......... | £150+VAT |
| Producer:.... | 3K-Computerbild |
| Supplier:...... | Copycare Business Services |
| | 231 Northborough Road, |
| | Norbury |
| | London |
| | SW16 4TU |
| Tel.:............. | 081-679 7307 |
| System:....... | Atari ST, STE or TT with minimum of 1Mb and monochrome monitor. |
| Manifest:..... | 4 disks, with manual and (excellent) tutorial. Includes IMG to TIFF converter and Atari or HP LaserJet driver (specify which), with scanner driver accessories and further printer drivers available. |

---
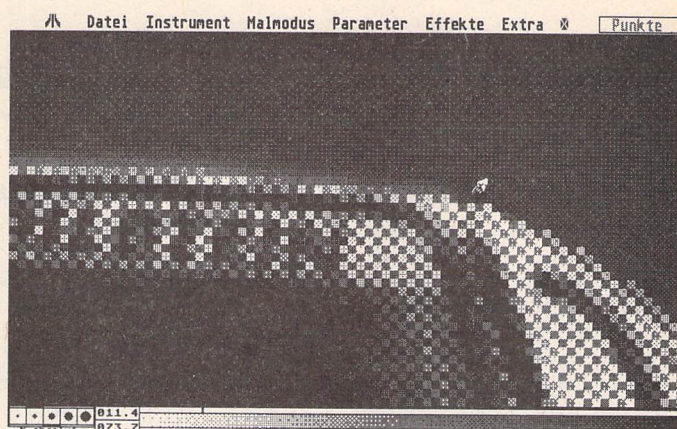


Here I have 'cut out' the photo of a car from its original background, using the mask to protect the car and then erasing the picture, and - with the mask still on - added a new background of a gradient fill. As the mask had not been defined particularly carefully, I am using the 'Finger' tool to blend the car into its new surroundings more seamlessly.
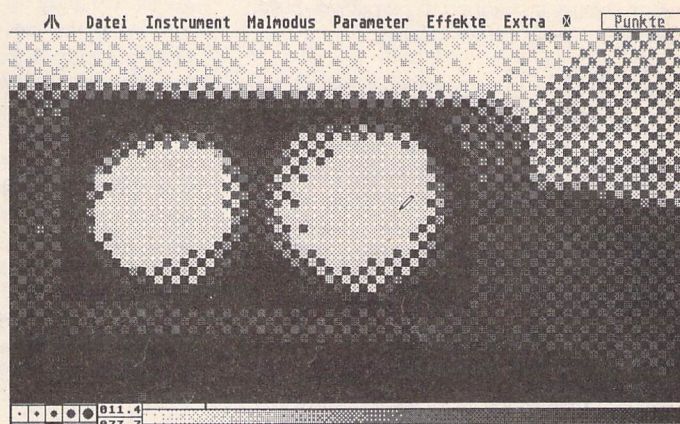


Garage service: to clean the headlights, I have defined a pen that will replace anything lighter than the background grey (mark below the palette at the bottom of the screen) with the grey marked above the palette. In other words, everything between the background and drawing shades is removed by the drawing shade.
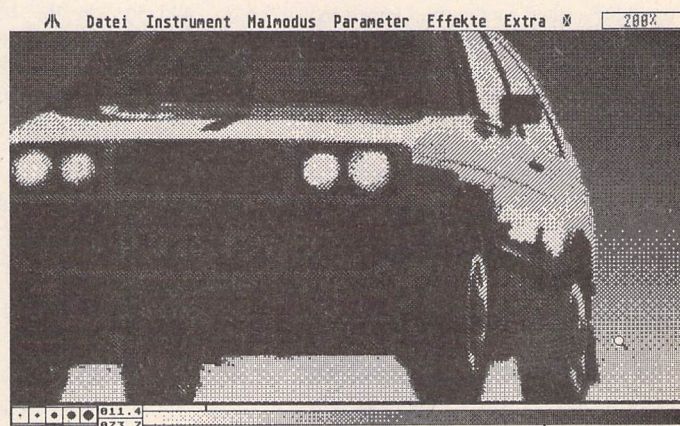


The finished illustration at 200% magnification, after some final tweaking of brightness and contrast to enhance the readability of the number plate and make the body work shine. This is a simple example of image manipulation, but you will undoubtedly think of other applications - 'signing' Gazza for your local club's team photo, perhaps, or putting Screaming Lord Sutch into 10 Downing Street?

# DeskJet Refills

*David Smith looks at ways of re-cycling empty HP DeskJet ink cartridges.*

Hewlett Packard DeskJet ink cartridges are not cheap. I have known for some time that it is possible to 're-cycle' them, and was recently impressed by the quality of sample printouts sent to the ST Club office that had been done with Quink permanent black ink injected into the cartridge by means of a hypodermic syringe. The ink is injected into the air-hole in the green plastic top of the cartridge.

Two companies are now producing kits for re-filling empty ink cartridges. Both use a more permanent, less 'runny' ink than that used in the original HP cartridges, and both offer colours in addition to permanent black: red, blue, green, brown, purple.

## The Kits

The re-fills from Hartley Wintney Systems Ltd. take the form of small plastic concertina-shaped bottles with a metal spout just long enough to reach the bottom of the sponge pad in the cartridge. Each bottle contains enough ink to do a complete re-fill, but as there are dangers inherent in over-filling the cartridges one is advised to use less than the full amount to start with and then to top up after a week or two's usage.

System Insight offers a 're-fill kit' which comprises:

small bottles of ink; a syringe similar to a hypodermic but not quite so sharp; mopping-up paper; rubber gloves; a couple of Q-tips for cleaning the contacts and/or the nozzles.

## Modus Operandi

In each case, the mode of operation is straightforward enough, but care needs to be taken not to hurry the process. The 'spout' or needle is inserted into the air-hole as far as it will go, and then, with a very slight pull-out of a millimetre or so, the ink is injected slowly. System Insight suggest that 15cc is injected in five steps of 3cc each. The concertinas are re-usable. I have re-filled an empty concertina by squeezing it flat, immersing the end into a bottle of Quink, and then letting it dilate so that it sucks up ink from the
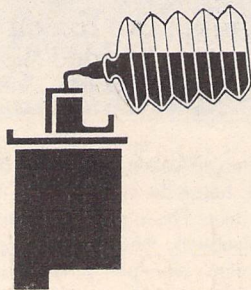
bottle. On one occasion, having done this with blue Quink, I failed to follow the advice about gentle pressure when filling the cartridge. The result of my impetuosity was an explosion as the cap came off, and suddenly my kitchen was blue. The air soon took on a similar (albeit more electric) hue as I cursed my impatience... Fortunately, the 'Permanent Blue' is not all that permanent!

## Results

The first attempt at using Hartley Wintney's brown ink re-fill was initially disappointing. Some of the cartridge nozzles failed to 'fire', giving a slightly streaky effect. I cured this by giving the cartridge a shake and then blowing gently through the air-hole to banish any air-sockets that may have been causing the trouble. This worked, and the results were much more impressive. I then proceeded to fill three more empty cartridges with blue-black, blue and green ink from bottles I had lying around. The results were good with two of these, but a bit streaky with the third. Hartley Wintney say that not all cartridges will re-cycle properly, especially those that had a shorter-than-expected life in the first place. Another problem arises if you have more than one cartridge on the go at the same time. Even if you take care to store the ones not being used in air-tight bags with noses pointing downwards, there may be some streakiness when they are used again. The prime button may cure this, but the one I'd filled with green ink refused point blank to fire on all nozzles when it was re-instated after a few days' non-use.

The blue-black re-fill was more successful, and so was the brown one from Hartley Wintney. Quink does give a somewhat 'blotchy' look to graphic-mode printouts, but is perfectly adequate for drafts or semi-drafts.

## Conclusion

If you merely want to re-fill empty HP cartridges with black ink and keep the cartridge seated in the printer, both of the kits give good results, though System Insight has the edge on price and ease of use. If someone could come up with a 'cartridge holder' that seals the nose in the same way as the
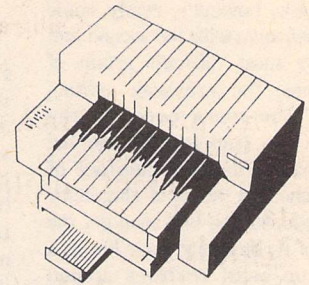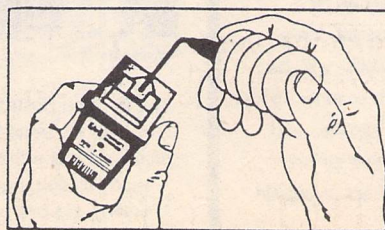
cartridge assembly in the printer does, then HP DeskJet users could have a whole array of different colours to play around with. If all you need is a good dense black, there's no problem with either source.

If you are re-cycling an original black cartridge with colour ink, you will need to run quite a few pages off before the colour starts to come through, owing to a small residue of black ink in the 'empty' cartridge. System Insight advise customers to send the empty black cartridge to them for its first colour re-cycling: they do a cleaning job first. The Hartley Wintney brown and the System Insight black were tested in the office, and the System Insight syringes are easier to use than the H.W. concertinas. The sample colour printouts sent us by both companies look very good, with none of the colours too pale or wishy-washy.

## New HP Cartridges

HP are now using a new kind of ink in their DeskJet cartridges. It is far less runny than the originals and also gives a denser black. They are offering, too, an upgrade kit to all DeskJet users who are suffering short cartridge life. If your serial number starts with 2937+ or if the cartridge sled is beige or off-white, you will **not** need the upgrade. Details are given with the enclosed leaflet accompanying all new cartridges.

---

Product:..........DeskJet Refills
Supplier:..........Hartley Wintney
Systems Ltd.
P.O. Box 163
Hartley Wintney
Basingstoke
Hants. RG27 8UL
Phone:..............(025126) 4246
Price:..............£14.95 for 2 black;
£17.95 for 2 colours
(Reductions on packs of 5)

Product:..........Deskfill
Supplier:..........System Insight
90 Wordsworth Court
Middlefield
Hatfield
Herts. AL10 0EF
Phone:..............(0707) 276913
Price:..............Refill Kit £25
(syringe, etc., + 4 bottles)
Single bottles: £5; reductions
for multiple orders up to
£30 for 10 bottles.

# Calligrapher *Junior?*

Calligrapher Junior is a wordprocessor with a difference: it has powerful graphic
and presentation facilities to give your words more impact.

1) Fonts provided in a variety of styles. **Real bolds**, *Real Italics*.
   Five different families of fonts supplied as standard:

   Zurich

   Holland and Holland **Bold** and *Italic*

   Unitype Medium and **Bold**

   MathSymbols αβχδεφγηΑΒΧΔΕΦ

   Ornaments ⊕ ◎ △ ▥ ☎

2) Vector outline fonts also allow you to print big headlines or small print.
   6pt to 128pt fonts.

   # 48pt Font

   small print at 6pt using vector outline fonts.

3) Imports .IMG and .GEM graphics, which can be freely resized within Calligrapher. You can also convert, crop and manipulate Degas, and Neochrome pictures.

4) Preview your document before you print, you can view 1 page, 2 page or 8 pages at the same time.

5) Multiple columns, have several columns on the page, edit with multiple columns on screen and preview your work.
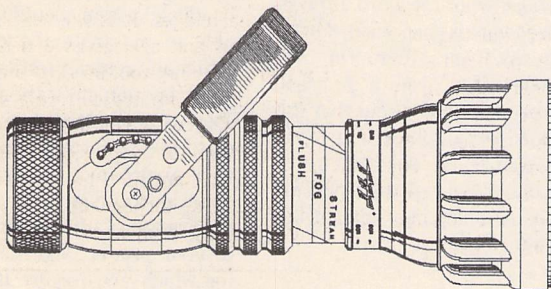
6) 80,000 word spelling checker, with phonetic and alphabetic guess. User dictionary, skip one or all occurrences. You can even check-as-you-type.
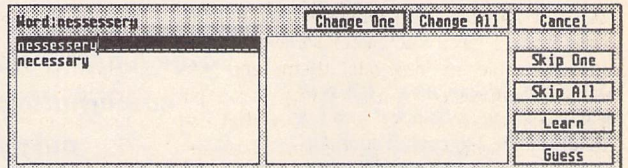
7) Up to 7 documents in memory at once. Switch between them, cut and copy from one to another.

8) Drivers for 9pin printers and 24 pin printers (this also drives ink-jet such as the BJ10e @180dpi). If you have GDOS bitmap fonts, Calligrapher can use these as well.

9) 200000 Synonym thesaurus included as standard. (Requires 1 double sided disk drive).

10) Headers, footers on odd, even or all pages. Change the headers and footers repeatedly throughout the document. Headers can contain multiple lines, rules, graphics, etc.

11) Footnotes with identifying numbers. You can put almost anything in footnotes, that can be included in normal text.

12) Calligrapher Junior can run on a 520st and is provided on single sided disks. 1Mb of memory is recommended.

13) Costs only £69-00 all inclusive.

# The only thing Junior is the price

Working Title, PO Box4, Eynsham, Oxford, OX8 1UD Tel 0865 88 35 92 Fax 0865 88 32 33

# Migraph Hand Scanner and Touch-Up

*Mike Kneen reviews a hardware/software combination that DTP enthusiasts may find irresistible: hand scanner and graphics package at a very tempting price and specification.*

Why this article now? It's now nearly two years since I read a review of the Migraph 'Touch-Up' graphics package in the US magazine ST-X-Press, and twelve months since acquiring the Touch-Up/Migraph Scanner package then being marketed by Software Express. At the time of writing, the Migraph Scanner has been somewhat eclipsed by the Golden Image and DaataScan Professional scanners, both of which offered much cheaper scanning. Nonetheless, Touch-Up is now bundled with the Golden Image Scanner at a favourable price, and no doubt the price of the Migraph Scanner will be adjusted to take account of the 'competition'.

First the Migraph Scanner. In appearance and operation, this seems to be effectively the same scanner that a number of other packages are based on. It allows a scan 4 inches in width, with length determined by available memory. The scanner has the 'standard features' for this type of hardware - variable contrast and a choice of line art (black-white images - 'soot on whitewash') and three 'dither patterns' allowing an imitation of grey tones in scanned photographs. Additionally, the scanner allows for scans at 100, 200, 300 and 400 dots per inch resolutions. (For a discussion of scanning resolutions, see my article in ST Applications 4.)

In operation you select the resolution and the dither pattern/line art setting required. An irritation is the need to set the resolution on the software side as well as the switch on the scanner. Touch-Up offers a default of 200 dpi. A mouse selection is required to match the resolution of Touch-Up to that of the current scan. Almost all that can be said about the operation of these beasties has already been said. Adam Boocock's review of the DaataScan Professional could be echoed word for word as far as the hardware is concerned. Suffice it to say here, then, (in case someone offers you a Migraph Scanner at a good price) that this seems to be a robust and fairly easily usable unit. The scans are of good definition, and the technique of hand-scanning in a straight line is soon acquired.

A few general points on dither settings (I think these would apply equally to other scanners):

Figure 1 below shows examples of scanned artwork from a black and white photograph - of my wife some time before I knew her. The two pictures are scans using different 'dither patterns'. The three upper panels are 4x enlargements showing the way in which Touch-Up uses various patterns of 'pixel clumping' to imitate grey tones. The effect is crude, but as I have pointed out in a previous article, some of the bottom end printing processes such as ink duplicators and some photocopiers are happier with coarse grained images.

A grouse I have seen in articles about scanner dither settings is that a computer-based image handling system should surely be able to automate the choice of dither and contrast settings? However, a moment's thought will show that automation would add quite a degree of complexity to the program. In any case, experience, trial and error, a knowledge of the characteristics of your printer, and the purpose for which you require the image will all have to be taken into account when scanning, so like as not you would end up over-riding the automatic system if it existed!

Hint: I have noted that, in general, the darkness setting needs to be lower for 'finer grained' dither patterns (patterns 2 and 3). In figure 1 the right hand picture (dither pattern 3) used a lower darkness setting than the left hand (dither pattern 1).

Let us then turn to the Migraph Touch-Up software package (v1.56). This is a powerful editor of monochrome bit-mapped images. It allows considerable scope in the preparation of pictures for incorporation in DTP work. In particular, it allows comprehensive editing and processing of scanned images. As the name implies, it's perhaps not the best tool for 'from scratch' creative drawing - but then I'm no artist, and I

Pattern 1          Pattern 2          Pattern 3

Dither Pattern 1                    Dither Pattern 3
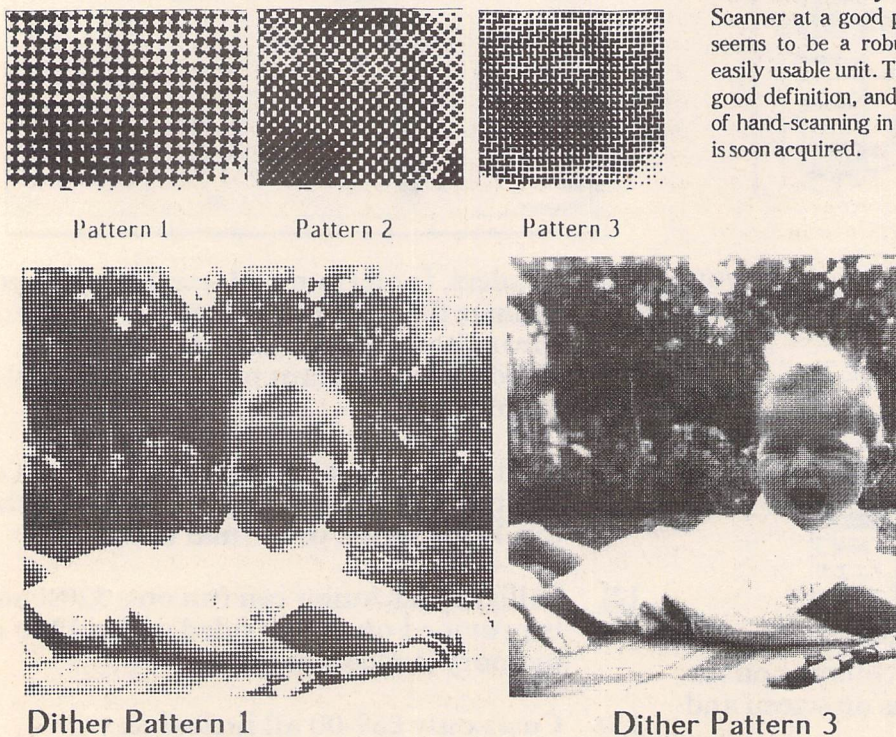
Figure One: Effect of dither patterns
(scans from black and white photo)

await the inevitable storm of contradiction from the Touch-Up creative art fraternity... It's certainly true that if, like me, you have limited drawing skills, a powerful drawing/art package like this will not, in itself, turn you into an artist! That said, even in the hands of the non-artist, Touch-Up allows creation of 'graphic designs' - logos and the like, and extremely useful adaptations of existing pictures - in my case for DTP work.

## The Software

This is very much an icon-driven program. Keyboard short-cuts are limited (and cunningly hidden away in the manual - none of those useful prompts for the key presses in the drop down menus). I suppose that the logic is that in a drawing package you are busy using the mouse most of the time.

In operation, Touch Up has six 'modes' (Drawing, Clip, Text, Lightning, Disk and Scanner) which are selected by the top six icons on the icon pad to the left of the screen. Beneath these appear a subset of tool icons appropriate to the particular mode that has been selected. Fig 2 shows two of these subsets. On the left, the Drawing mode is highlighted in the top group, and the lower set of icons show the Drawing Mode set of tools. On the right is the equivalent set with Scanning mode selected.

LIGHTNING MODE provides a quick paint mode. The main functions of most drawing packages are there (with the curious omission of a basic 'pen') - a variety of customisable 'brushes' and fills, including Bézier and B-spline curves (Fig 3), 'Fat Bits' (editing individual pixels), adjustable spray-gun, lasso and so on. When you bungle, the splendid re-sizable eraser and two levels of 'undo' are handy! The usual choice of 'writing modes' is available - Transparent, Replace, Reverse Transparent and 'XOR'. These determine the way objects you draw mix with the image already on the drawing surface.

Like many other paint packages, Lightning mode allows you to work on different parts of an image larger than the screen. Unlike some other packages, however, there is a useful 'Locator' (Fig 3) to move your way around the picture.

So far so good. But what is there here that an inexpensive package such as Hyperpaint doesn't provide? Briefly, the answer lies in the
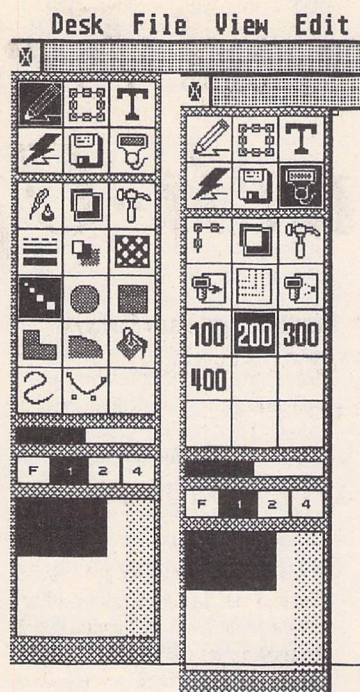


Figure Two: Icon Sets

Drawing Mode (left)
Scanning Mode (right).



Figure Three: Bézier curves

A - Bézier curve and its control points
B - some brushwork
C - outline of a "Bézier Brush" ready for use
D - the locator box to move the work area

large images Touch-Up can work on, and the power of the features it can bring to bear on these images. Size is very important when you use a higher resolution printer - 24 pin, laser or Inkjet with 300 or 360 dots per inch (dpi) output. Here a whole screenful of picture will be no more than a postage stamp in size when it is printed out. Touch-Up allows you to work on an image that's large enough to take advantage of the resolution of your printer, and at last to produce computer artwork that doesn't look 'blocky'.

Not only will Touch-Up deal with a large image file, it will also allow you to work on the whole image at 'Fit-to-screen' size where necessary. Since the screen displays something like 80 dpi, a reasonable sized picture needs several 'screenfuls'. This would make life difficult if you were attempting to place, copy or move elements of the picture or lines of text larger than a screen. Many of the Touch-up features will work with the whole picture displayed, neatly avoiding this problem. Some packages will only allow you to preview the whole image, not to do anything with it.

## The Various Modes

**Drawing mode** adds several features to the basic ones outlined in 'Lightning', for example line styles, weights and shadows.

**File mode** handles all the disk operations, in particular allowing a wide range of file formats to be imported. These include Degas/ Elite, .IMG, MacPaint, .NEO-chrome, .PCX, .TIF, .TNY and .GEM. Output options include .IMG and Degas, but also usefully .PCX, .GIF, .TIF, IFF-ILBM. Although these sound obscure formats to many ST users, they do allow flexibility in exporting images to, say, a PC-based system. File mode also allows a direct output to the printer if you have at least 2 Megabytes of Ram and a GDOS printer driver. Direct output to the Atari Laser is also possible, even in the absence of GDOS.

**Clip mode** allows you to carry out various processes on a selected area of the image, designated by drawing out a 'clip box' over the area you want. You can then flip, mirror, slant, rotate (from 1/10 of a degree up). You can also move or copy the contents of the clip area, choosing between the 'write

modes' (see above) for the way in which you wish to paste down your clip. It's very handy to be able to save the clip to the clipboard, or to disk in a variety of formats. Equally, an image from disk can be loaded into a clip box and then pasted into your current work. Clip mode also allows you to apply various processes to the clip area - colour reversal, masking part of an image with a pattern, automatically cleaning up stray dots and so forth.

**Scan mode** simply controls the scanner - or rather partly controls the scanner. I have already remarked on the division of control between software and hardware here. Scanned images can either fill the page, or they can be directed to a pre-sized clip box for incorporation in an existing image.

**Text Mode** is limited to 35-character strings, and is really only intended for labels and headings. Touch-Up is no DTP package! Outline fonts are provided in 10 styles ranging from Chancery (curiously the default!) to Helvetica and various cousins of Times - Bookman, Palatino, Schoolbook and so on. There are no add-on fonts, but what is provided is quite

adequate for the limited task for which this mode is intended. Using Timeworks DTP, I find Touch-Up's text mode useful for producing a big headline as an image file, and maybe for incorporating a picture into the Heading. Most of the text effects you'd expect are provided - bold, slant (forwards/backwards), outlined, filled and so on. Two points to note: text generation is slow, and outline fonts are not necessarily going to look brilliant in small sizes. You may also feel the need for some 'kerning' (moving two letters closer together to eliminate excessive white space between them). This can be done by entering Clip mode and moving chunks of text closer together. It sounds clumsy, but works well.

## General Features

A particularly useful feature is the control the program allows over page size, clip size and dot resolution. The program will allow you to determine the precise frame size for an image file in, say, a Timeworks document to be output at 300 dpi, so that the image may be loaded with no distortion. Equally, the clip box may be set to the undistorted size for an image that is being read into your current picture.

Image files are large, and loading is not instant by any means! Given a number of image files on disk with obscure file names which fail to remind you of their contents (!),

the 'slide viewer' feature allowing a quick 'peep' at a file, telling you height and width in pixels, and showing the resolution, is very useful!

The manual is clear and straight-forward - except that, as so often, the lack of index spoils the effect slightly. Because the manual is laid out by mode and by icon set, there is a fair bit of repetition. This is no great problem except that it doesn't encourage you to read it from cover to cover, so that you may well miss some handy tips - the existence of a set of keyboard short-cuts, or the possibility of making the Tools menu 'Tearaway' for example (Fig 4).

On this last matter, the Tearaway tools menu is perhaps one of my few disappointments with Touch-Up. A keyboard command is required to produce the Tearaway menu - it would be lovely to simply click the right mouse button to bring up a pop-up tools menu as with Arabesque and Megapaint!

## Hardware Requirements

Touch-Up will run happily on a 1040 ST - I used this configuration for some time. A useful feature of the program is that it will allow 'paging to disk'. That is to say, if you have a Hard Disk, the program will allow you to use some of your hard disk capacity instead of RAM for handling large images.

BUT - this will be slow, AND it only works with hard disks. None the less, if you have a 1040 and hard drive, then this facility means that you know you can handle the occasional larger image. 'Paging' to a floppy disk would be too limited in size and slow to be of practical use. A memory upgrade to 2.5 Megabytes allows much greater flexibility here. It also allows direct GDOS output to the printer. With less than 2 Megabytes of RAM, direct output is not possible, and a separate Outprint utility is provided. This means you have to leave the program and enter Outprint in order to see a draft of your latest masterpiece on paper. Although it is possible to 'shell' to and fro between the programs, the delay is very irritating. On a floppy based system stronger epithets might apply.... Now that memory is cheaper....

## Speed

Touch-Up pays a price in speed for the power and scope of some of its features. The Lightning Mode compensates for this to a large extent, giving a speed of operation similar to other art packages for the basic functions. You don't then mind the slowness of some of the more exotic and powerful pixel-crunching. The Manual notes that Touch-Up will run faster without GDOS installed. On a floppy based system you could easily arrange this - re-booting with GDOS only if

required for a printout. I use G+PLUS (an improved, third party GDOS substitute), and am happy to say that Touch-Up doesn't seem to mind the substitution. Furthermore, I couldn't see any noticeable difference in speed between running with G+Plus and without it. It may be that the effect is only seen with 'genuine GDOS' or with smaller RAM.

## Conclusions

A useful and powerful adjunct to a scanner, and an excellent way of preparing images for DTP work. It's still worth having - especially at the special offer prices currently available with the Golden Image Scanner. I very much hope someone will continue to sell Touch-Up as a progam on its own. At a price of £90-£100 it would compete quite well with Megapaint and the like.

## Availability

Touch-Up is available bundled with the Golden Image Scanner from Evesham Micros at £179 for scanner and program.

## Competition

**STAD** - Power Computing

**Arabesque** - Signa (bit image and vector graphics); demo disk available on ST Club disk DEM.47.

**Megapaint** - Silica Systems £99.95 - fully reviewed by Frank Hollis in January ST Applications.
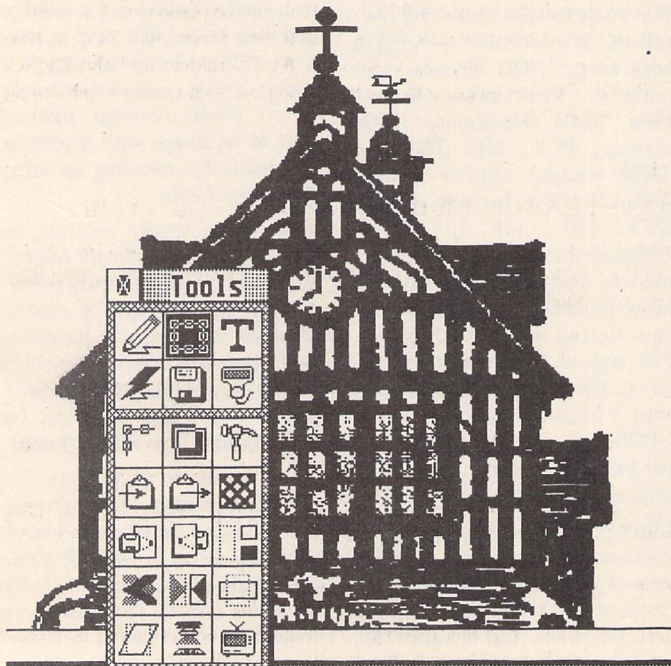
Figure Four: Tearaway menu in use
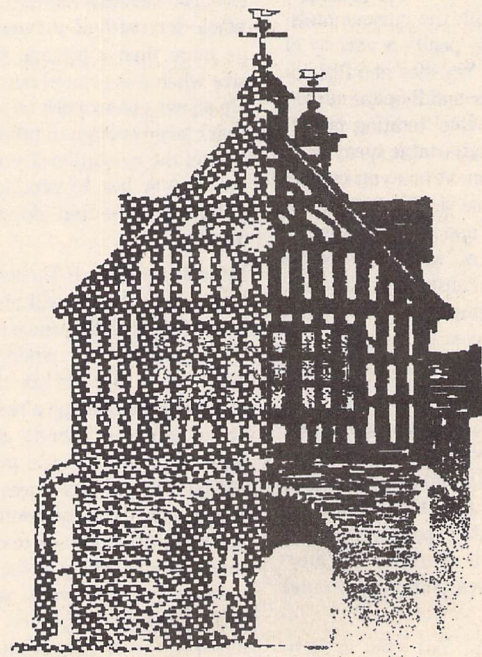
Figure Five: Masks and sprays modifying a scanned pen and ink drawing

# TeX First Aid

## Up and Running with TeX on Your Atari ST

*The typesetting system TeX (officially pronounced 'tech', with the ch sounding as in 'loch') has attracted a great deal of attention since its development in the early 1980s by Donald E. Knuth. Knuth, a professor at Stanford University, is the author of many books and papers on computer science, of which* The Art of Computer Programming, *a three-volume series on the science of algorithmics, is the best known. TeX itself was initially conceived as an exercise in the development of a large and complex piece of software in a well structured way, but has grown beyond this initial brief to become the leading system for typesetting technical books and other documentation in the U.S.A. TeX's design goals included portability between operating systems, and device-independence for output of the typeset document, and it is now available across a large range of mainframe and mini computers, including the Atari ST.*
*In this article David Harvey gives a step-by-step guide on how to set up a working system.*

Peter Cameron's article in ST Applications 2 described the ST versions available: this article will show you how to install the German shareware TeX on a floppy-drive-based ST system. The complexities of the installation procedure, coupled with the fact that the documentation is in German, have probably discouraged many from persevering with the system on the ST: I hope that the procedure described here will encourage you to get the disks out and have another go, or to give TeX a try if you haven't yet got a copy. I promise it is worth the effort of the hour or two it will take!

For a basic installation you will need the following master disks:

TeX base system with screen previewer and fonts:
WPR.55     (TEX1:)
WPR.56     (TEX2:)

Printer device driver and fonts, for example:
WPR.60   (DRIVER: for Star NL10/Epson FX/LX and similar)

These disks are double-sided, so you need at least one suitable drive. Also, given that the installation I am about to describe uses a RAMdisk, 1Mb memory is essential. Throughout this article, I assume the RAMdisk is installed as drive M: - if you call yours something different, you must make the necessary adjustments as appropriate. Two disk drives are a help, although it is possible to install and run TeX on a single-drive system.

In addition to the TeX basic system, some extras will be required:

a RAMdisk, as mentioned above;
a Command Shell (for example PCOMMAND - gulaam is probably going to take too much precious RAM);
a text-editor capable of producing and reading ASCII files.

Most of the TeX files are supplied archived. Although the program ARCX.TTP is supplied to extract files from their archives, a full version of ARC, together with ARCSHELL, makes finding your way around the distribution disks and extracting the right files to the right place very much easier. All these extras, in addition to the configuration and batch files described in this article (and a copy of the article itself), are available on a single 'TeX First-Aid Disk' from the ST Club (PD disk WPR.82).

For a two-drive system, the final installation will require five disks (seven if you require the German versions of both TeX and LaTeX), plus any number of disks to store and work on the files you will edit and process. I recommend using a utility such as FCOPY to format extra sectors and tracks on all these: you will be grateful for the extra space on a 10-sector/81-track disk! In addition, FCOPY speeds the process of copying disks 3 to 5 from disk 2. The disks will be used as follows:

1   TeX initialisation and program, printer driver program;
2   PLAIN - base TeX format, English version;
3   LPLAIN - base LaTeX format, English version;
4   PLAING - base TeX format, German version (if required);
5   LPLAING - base LaTeX format, German version (if req'd);
6   SCREEN - previewer and fonts;
7   PRTFONTS - font library for printer driver on disk 1.

Incidentally, I strongly recommend preparing the German version of LaTeX, at least: there is a LaTeX manual in source form on the distribution disks: although this is in German, the examples and reference material are very clear, in most cases putting the typeset output and the TeX source which produced it side-by-side. After you have generated this document, itself a good test of your TeX installation, you may re-use the disk in question.

## Step 1: Initialisation disk (1)

Create a \TEX folder on a freshly-formatted disk. Using ARC, move the following files from the TeX distribution disks to this folder:

```
TEXSETUP     TEX1:\TEX.ARC
TEX.TTP      -
NL10.TTP     DRIVER:\NL10.ARC
             (or an alternative printer driver)
```

Also in this directory, you may find it useful to place the command shell program you intend to use, although if space in RAM becomes a problem (this folder will end up on a RAM drive) this can be placed in a folder of its own, or even a separate disk. If you wish to boot from this TeX disk, now is the time to copy any .ACC files, an AUTO folder, and the DESKTOP.INF of your choice, and you may also find it convenient to have an editor on the disk.

Step 2:
Base TeX format disks (2-5) - preparation

Next we create a base TeX disk, and copy this to form disks for LaTeX and the German versions of both TeX and LaTeX. The initial directory structure and files you require are as follows:

```
\TEX
   \TFMFILES
      *.TFM TEX2:\TEXINPUT\TFM\TFMFILES.ARC
   \STDIN
      *.TEX TEX2:\TEXINPUT\STDINPUT\STDINPUT.ARC
      *.STY   -
```

Having un-archived these files, copy the disk three times, so you have (for now, at least) four identical disks.

Step 3: Creating the TeX format files

This is the most complicated step, so reread this section before proceeding. Take another empty disk, and populate it as follows:

```
INITEX.TTP     TEX1:\TEX.ARC
TEX.POO
```

TEXSETUP	-
PLAIN.TEX	TEX2:\TEXINPUT\PLAIN\PLAIN.ARC
PLAING.TEX	-
PLAINO.TEX	-
EHYPHEN.TEX	TEX2:\TEXINPUT\HYPHEN\HYPHEN.ARC
GHYPHEN.TEX	-

This disk will be used to create pre-compiled format files for the two (or four) flavours of TeX required. The German documentation indicates also that the *.TFM files need to be present: this will only be required if you are installing on a single disk system. Copy them from one of the four disks created in the previous step.

Next, edit the file TEXSETUP on this disk. You will see in this file a number of file path specifications, all of which are to be changed to A: (e.g., texinput = A:;), with the following exception: dumppath = B:\TEX;. In addition, if you are installing on a two-drive system and have not copied the *.TFM files to the current disk, the setting tfmpaths = b:\tex\tfmfiles; must appear. Save the file.

Now we are ready to create pre-compiled versions of the basic TeX macros. With the disk set up as above in A:, place one of the TeX base disks in B: (or have it ready to place in drive A: as 'logical' drive B: if you are installing to a single-disk system), and run INITEX.TTP, with parameter PLAIN. All being well, the system should run for a while, then stop at a '*' prompt. At this point, type \dump then hit <return> (having replaced the current disk with the base disk if you are running a single-disk ST). The result of this activity should be a file with the name PLAIN.FMT in the \TEX folder of a base disk. Label the disk 'PLAIN': it is now ready for use. If you don't make it to the '*' prompt, then it is likely that INITEX cannot find some of its files - check the TEXSETUP file and the directories on the disks you are using, before trying again.

If you require the German version of TeX, repeat the process with a second base disk, this time supplying the parameter PLAING to IN-ITEX.TTP. This time, the file created will be PLAING.FMT: once again, label the disk accordingly.

Now delete the files PLAIN.TEX, PLAING.TEX and PLAINO.TEX, and replace them with the following:

LPLAIN.TEX	TEX2:\TEXNIPUT\LATEX\LATEX.ARC
LPLAING.TEX	-
LPLAINO.TEX	-
LATEX.TEX	-
LFONTS.TEX	-

Repeat the process described above with the remaining two base format disks, supplying the parameters LPLAIN and LPLAING to INITEX.TTP, producing LPLAIN.FMT and LPLAING.FMT respectively. Assuming all is well so far, you may now delete all files from the INITEX disk. In addition, the files \TEX\STDIN*.STY on the disks PLAIN and PLAING are not required and may be deleted. Now go and have a cup of coffee (or something stronger if you feel you need it).

Step 4:
The SCREEN output previewer (disk 6)

Create the following folder structure on disk 6:

```
\PRTFONTS
    \RES101.SCR
        \MAG____1.000
        \MAG____1.095
        \MAG____6.192
        \MAG____1.440
        \MAG____2.488
        \MAG____3.583
        \MAG____1.728
        \MAG____0.900
        \MAG____1.200
        \MAG____2.074
```

The easiest way to do this is to copy the identical structure from the TeX distribution disk, by dragging the folder to the new disk and then delete the .ARC files at the leaves of this directory tree.

Then un-archive each of the .ARC files in the leaf folders of the distribution disk (MAG____*.*) into the corresponding folders on the preview

disk (6). Finally, un-archive the following file into the root folder of this disk:

SCREEN.TTP	TEX1:\PREVIEW.ARC

The screen previewer disk is now finished.

Step 5: Printer fonts (disk 7)

The procedure with this disk is almost identical to disk 6. Create an analogous directory structure on the disk -

```
\PRTFONTS
    \RES240.NL (or whatever it is called on your driver disk)
        \MAG____1.000
        \MAG____2.074
        \MAG____1.095
        \MAG____1.200
        \MAG____1.440
        \MAG____2.488
        \MAG____1.728
        \MAG____0.900
        \MAG____6.192
        \MAG____3.583
```

Then un-archive the files in the distribution disk directories as before. We already have the printer driver program on disk 1: this is to save space on disk 7, printer fonts taking more space than the corresponding screen fonts.

Step 6: Setting up TEXSETUP (disk 1)

The final two steps ensure a correct environment for the operation of TeX. Working in the \TEX folder of disk 1, firstly copy TEXSETUP to TEX-SETUP.P (for PLAIN), and edit it. This file directs TeX to particular drives and folders for the numerous files it must read and write, and also controls other aspects of its behaviour. The important entries to be changed in this file are as follows:

```
defaultformat   = a:\tex\plain.fmt;
inputpaths      = .,
                  m:\temp,
                  b:\texinput,
                  a:\tex\stdin;
outputpath      = m:\temp;
tfmpaths        = a:\tex\tfmfiles;
logpath         = b:\log;
dvipath         = b:\dvi;
formatpaths     = a:\tex;
```

The line containing **german;** should have a percent sign at its start - put one here if there is none. This character, here as in TeX source files, is a comment sign: everything else on a line is ignored following one of these. You may delete the lines containing **poolfile** = and **dumppath** =, as these are only relevant to INITEX. Everything between **beginkeytable;** and **endkeytable;** should remain as it is: this table is used to convert important characters in the input stream to other characters and TeX commands.

You will notice that the path given in **outputpath** appears again in the list of **inputpaths**. This is important, as TeX (and particularly LaTeX) may create temporary files during a run, which must then be available for input during following runs. It does not matter where **outputpath** points to - if you don't have room in RAM for an extra folder on the RAMdisk, set up a \temp directory somewhere else, but make sure that the path appears in **inputpaths**!

Save this file, and copy it three times, to TEXSETUP.PG, TEXSETUP.LP and TEXSETUP.LPG, creating setup files for plain TeX, plain TeX (German), LaTeX and LaTeX (German) respectively. These now need minimal editing, as follows:

TEXSETUP.PG	defaultformat = a:\tex\plaing.fmt;
TEXSETUP.LP	defaultformat = a:\tex\lplain.fmt
TEXSETUP.LPG	defaultformat = a:\tex\lplaing.fmt

In addition, the line containing **german;** in the .PG and .LPG versions must be uncommented by removing the '%' sign. You now have one setup file for each of the versions of TeX created.

Step 7: Setting up the shell

This, the last step, depends on which command shell you wish to use (although it is possible to run without one). Similar facilities should exist for most shells. For PCOMMAND, create (or edit) the file AUTO-EXEC.BAT in the folder in which PCOMMAND.PRG has been placed. This file contains commands run automatically when PCOMMAND is run, and should look like this:

```
echo off
prompt $n:$p$g$C|C
path m:\tex;m:\;a:\;b:\;

mkdir m:\tex
mkdir m:\temp

if exists m:\tex\tex.ttp goto c1
copy \tex\*.* m:\tex

:c1
```

Line 2 sets a command prompt which contains the full path of the current folder. Line 3 will cause PCOMMAND to search the folders identified for any .PRG, .TTP or .TOS programs, or .BAT batch command files, whose names are entered at the prompt. The rest of the file creates folders \TEX and \TEMP on the RAMdisk, and if they are not already there, copies all the files in the \TEX folder on the installation disk to the equivalent RAMdisk folder.

Four batch files are useful to run the TeX program in its various incarnations. These must be created in the \TEX folder on disk 1: the basic form (for plain TeX) is:

```
echo off
if %1==. goto error

dir a:\z

echo tex -sm:\tex\texsetup.p %1
tex -sm:\tex\texsetup.p %1

goto end

:error
echo USAGE T (input file)

:end
```

This will provide a useful message if you do not supply a source file name, otherwise it directs TeX to use M:\TEX\TEXSETUP.P as a setup file (the -s parameter in line 7). If you call this file T.BAT, the other three could be TG.BAT, LT.BAT and LTG.BAT - don't forget to change line 7 to refer to the appropriate TEXSETUP file. Line 4 is a dummy DIR request, needed with PCOMMAND to reset the internal drive tables if a disk has been replaced in a drive.

Running TEX

And that's that! If you have got this far, another small celebration is in order, assuming of course that you can wait before trying TeX out. The final exertion will involve the creation of a TEX input disk, and the generation, viewing and printing of the LaTeX manual described above. On a new disk, create the following three folders:

```
\TEXINPUT
\LOG
\DVI
```

Un-archive the following files into the \TEXINPUT folder:

LKURZ.TEX	TEX2:\TEXINPUT\DOCUMENTS\ DOCUMENTS.ARC
LK1.TEX	-
LK2.TEX	-
LK3.TEX	-
LK4.TEX	-
LKSYM.TEX	-

Place disk 1 in drive A:, locate and run PCOMMAND. After some activity, you will find yourself at an MSDOS-like prompt:

```
A:\>
```

Place the TEX input disk into B:, then type

```
B:<return>
CD TEXINPUT <return>
```

Replace disk 1 in drive A: with the German LaTeX disk (5), then (assuming batch files have been created as described in step 7 above) type

```
LTG LKURZ
```

All being well, TeX will leap into life. As long as the program doesn't stop, you may safely ignore the flurry of warning and other messages you will see. An indication of progress is given by numbers in square brackets: these are the numbers of pages just written. At the end of the run, the following message will appear, before TeX returns you to the PCOMMAND prompt:

LaTeX warning: Label(s) may have changed.
Rerun to get cross-references right.

This does not mean things have gone badly: LaTeX builds tables of contents, figures and tables as the run progresses, which must be incorporated in a second run of TeX. In fact, because of the size of the document, you will have to run LaTeX twice more to resolve all page number references. Now type

```
CD \DVI <return>
DIR <return>
```

and the resulting directory listing should reveal a file named LKURZ.DVI. This DeVice Independent file forms the input to the screen previewer and printer drivers: it may be sent to any system where TeX is installed and printed there, possibly on higher-resolution devices. To run the previewer, place the appropriate disk (6) in drive A:, and (still in B:\DVI) type

```
SCREEN -fa:\prtfonts\ LKURZ <return>
```

Note that in PCOMMAND you may first need to perform a DIR A:\ to reset the drive, as described above. The -f parameter identifies the font directories for the driver: there seems to be a problem running the TeX device drivers from PCOMMAND batch files, otherwise this command, too, would be placed in a batch file. The screen will clear, and an image of the top left of the title page will appear at full size. The following key-strokes control the previewing process:

cursor keys	move around the page
Help	display an overview of the whole page (press it again to return to full-size)
Return	next page
shift-<left cursor>	move back a page
Esc	Quit the program

The command line for the printer device driver is equivalent, although there are more options. Replace the screen previewer disk in A: with the printer fonts disk, then the following command will cause the printout of the whole document:

```
NL10 -fa:\prtfonts\ LKURZ <return>
```

Before you do this, though, the following command-line options may be of interest:

-b<n>	start output at page <n>
-e<n>	end output after page <n>
-d	print every other page

A neat trick, particularly easy with continuous paper, is to print the odd pages first, then take the paper out, reverse it and print the even pages on the back. These two commands are needed:

```
NL10 -fa:\prtfonts\ -b1 -d LKURZ <return>
NL10 -fa:\prtfonts\ -b2 -d LKURZ <return>
```

Finally, print out the title page (page 0!) by giving both -b0 and -e0 as parameters to the same command. Be warned - the output is in high quality graphics mode, and takes time.

The results, as you should now be in a position to appreciate, are astounding. TeX on the ST is a considerable feat of programming: the author of the conversion, Stefan Lindner, deserves praise for his effort, and I would strongly urge anyone who finds they use TeX to any extent to send him the 60DM shareware registration fee - the TeX First-Aid Disk has details. As a first attempt at creating a TeX document of your own, I suggest you try the LaTex LETTER style described in section 4.4 of LKURZ - impress your friends and bank-managers with typeset correspondence!

ST Internals

Introduction

Ever since electronic computers were invented there has been a need for storage of both the computers' programs and their associated data files. So far in computing history, mass storage has been almost exclusively on magnetic media: tape or disc. In the late 1970s the first floppy discs were invented, 8 inch monsters that took 100 watts to spin the disc alone and only held about 100KB of data. Since then progress has produced many more compact and efficient floppy drives, the most popular current format being the 3½" disc in 720KB or 1.44MB densities. The Atari ST uses this size of disc: very early models had a single-sided mechanism which only held 360KB, but after early 1987 all models of the ST had a double-sided drive fitted as standard. As the capacity of memory chips increases, so does the threat to magnetic storage. The ability of the hard disc manufacturers, however, is considerable: each year sees larger and larger storage on smaller discs, with new technologies such as thin film heads and new coatings currently allowing storage of over 300MB on a cheap 3½" low power drive. Until non-volatile memories are available to challenge this, the magnetic disc will remain supreme.

Drive Physics

The magnetic disc drive, whether a floppy disc or a fixed disc, has a rapidly rotating disc of material covered with a magnetic coating which spins under magnetic heads. These heads work in exactly the same way as those on a domestic tape recorder by inducing differing levels of magnetic flux onto the disc (as co-axial tracks of data) and then reading back those flux changes and converting them into voltages (see Fig 1). The floppy disc spins at 300rpm and has two heads, one on the top and one underneath the disc. The heads are usually moved on a worm drive which allows 100 tracks per inch but at a slow speed, typically 3ms track to track, the data transfer rate being around 250KB/s. Hard discs (also known as fixed discs or Winchesters) spin at 3600rpm and can have many discs or platters, each of which has its own heads. As the disc is spinning so much faster, the data can be accessed that much faster than on a floppy. Also, because the drive is encased in a sterile dust-free dry nitrogen atmosphere, the heads can fly very close to the surface of the disc. The high accuracy of the head drive motor which is servo controlled allows many more tracks per inch and so a vastly increased storage capacity: the data transfer rate of ST hard discs can approach 8Mb/s.

The ST and Floppies

As mentioned above, the early ST's had single-sided drives, which are getting rare nowadays as they are very cumbersome to use and the quality of the mechanisms left a lot to be desired. Most users upgrade the drive to a double-sided one, the only problem with this being that Atari (in their usual wisdom) made special front panels, and replacements have to have a small hole made to accommodate the eject button. A good quality replacement drive should cost between £50 and £65: fitting only takes about 30 minutes. Some enterprising Germans have added high density floppies to ST's. These give 1.44MB storage but require a HD mechanism and an internal modification to the ST which asks the floppy controller to work well above its rated speed. The advantages only seem worthwhile as a hard disc back up or to access IBM software which is increasingly supplied on HD discs. There are problems, of course: special (and expensive) HD discs are required and the HD drive cannot reliably format discs for 720K operation. The surprising thing is that on the new TT Atari have not fitted 1.44MB floppies. This may be due to compatibility but seems strange when most modern IBM clones have such drives.

The Floppy Controller

The device used in the ST is the Western Digital WD1772, derived from the FD179X family, fabricated in NMOS and supplied in a 28-pin DIL package. This is a relatively old controller chip but still offers good performance. The ST does not use it to the full as it only handles 2 floppies. To help control the floppies, the sound chip (YM2149) is pressed into service: it gives the drive select and side select signals. The WD1772 provides the remaining signals as shown in Fig 2. Most floppies use the 'Shugart' interface which is a 34-way connector with rules for the signal

connections (shown in Table 1.0); within some constraints, any drive with a Shugart connector will work on an ST. The drives work through the DMA (Direct Memory Access) system on the ST, which allows the DMA controller to take over the system busses whilst data transfers are in progress and so relieve the CPU of the overhead. The CPU could handle the data rate on the floppy without too much trouble, but it is essential on hard discs to avoid missing any data. Until recently most IBM clones didn't use a proper hard disc controller and their data transfer rates were abysmal.

Typical Atari

In order to save a few cents Atari, in their infinite wisdom, decided not to use proper line drivers on the lines to the floppies. This can give problems if the drives have 1K pullups (which is the Shugart spec). Some machines have no problem but a lot do. The manifestation of this problem is usually when an external drive is fitted: one or both will then only work in single-sided mode, or weird symbols appear in the drive window. These problems are due to the YM2149 not being able to pull down the lines to a logic low and so the drive reads from the wrong surface. When there are two drives connected the pullup resistance becomes 500 ohms which can defeat even the strongest YM2149! The cure for this is fairly simple: just remove the pullup on one of the drives connected on the side select line (see Fig 3). Another little problem with Atari's implementation is that of not checking in hardware for a disc change. This little nasty can allow the directory of one disc to be overwritten with a new one.

Direct Memory Access

In order to speed up data transfers to and from disc drives, the Atari ST implements DMA. This fearsome sounding term is really quite straightforward. The system sets up some registers (hiding in the Memory Manager) with a start address in memory, a counter for the amount of data to be transfered and the type of transfer desired. The 68000 processor then hands over control to the DMA controller which takes over the buss and gives control back when the counter has emptied. The advantages of this is much faster transfer. The 68000 has to go through lots of machine code cycles for each word of information transferred; the DMA device simply moves it all at top speed (1 MB/s on the hard disc port). The sequence of events is:

1 - select floppy 0 or 1
2 - select side 0 or 1
3 - load DMA base and counter registers
4 - select DMA read or write
5 - select DMA sector count register and load it
6 - issue FDC write/read command
7 - perform DMA until sector count is zero
8 - check DMA status for errors

The DMA system is also used by the Blitter to move data around in memory.

Tossing it around

The first version of TOS (1985) did not handle floppies very well. The next version (1987) was much better, owing to improved software for the interleaving and skewing of the sectors. The latest version of TOS (1.4) and of course the ST-E TOS (1.6) have the
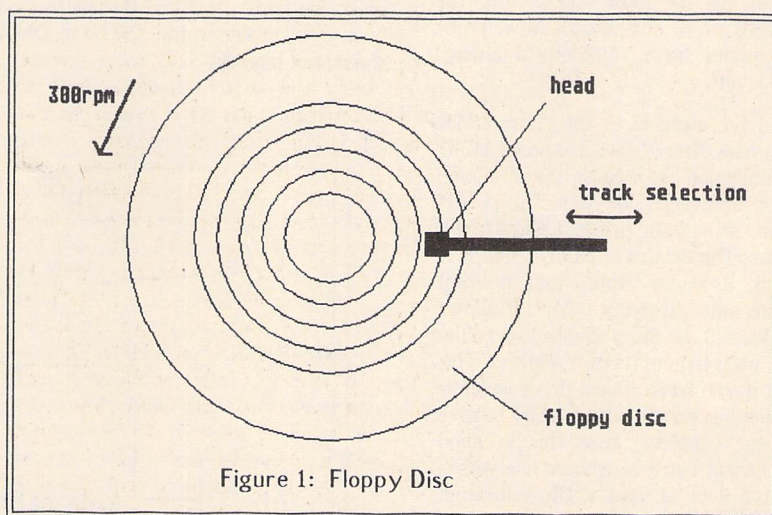
Figure 1: Floppy Disc
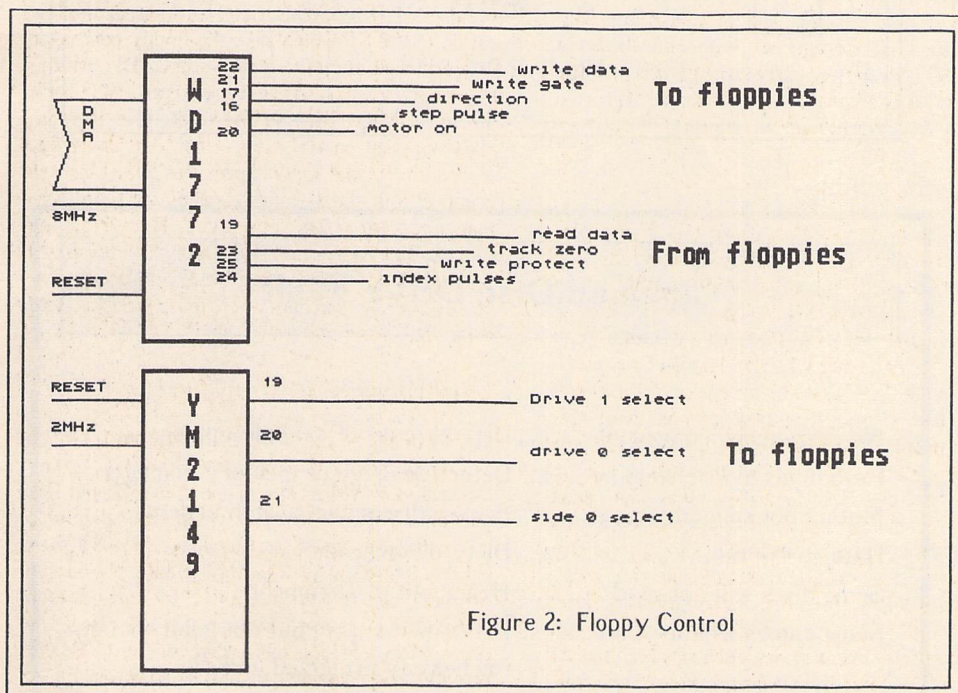
Figure 2: Floppy Control

8	index
10	drive select 0
12	drive select 1
16	motors on
18	direction
20	step
24	write gate
26	track zero
28	write protect
30	read data
32	side 0 select

Shugart

Table 1.0

capability of formatting discs which may be directly read by IBM machines without resorting to special formatters. This is very useful for file transfers between such machines.

Typical Problems

In order for the ST to reach the stage of booting from floppy, most of the machine must work. Often an owner complains of his/her floppy not working as the light on the keyboard doesn't come on. The fault is usually a system fault and nothing to do with the disc drive itself. Some common faults to do with the drive and associated circuitry are shown below.

The Hard Drives

Many moons ago, hard drives were out of reach of all but the most serious user (in 1986 a 32MB drive cost £650). Now, however, the prices have tumbled to almost affordable levels.

The hard drive attaches to the Atari DMA port which uses Atari's own protocol (ACSI) for communication with SCSI (Small Computer Systems Interface) devices. This port is also used for some laser printers, CD-ROMS, scanners, etc. The beauty of SCSI is that it is a standard, used by Apple and on Sun workstations amongst many others. It allows up to 8 devices to be daisy-chained on to the SCSI buss, each having its own address. This means that if you have a hard drive which is too small another can be added easily to give more storage capacity; bear this in mind when purchasing a drive - choose one with a SCSI port on it or at least a DMA through port.

Advantages

The hard drive's main advantage over the floppy is the speed. A fast modern drive can load programs at almost the speed of a RAM disc. Also, with the advent of TOS 1.4/1.6, the general hard disc handling has been improved. Using Neodesk 3 with a hard disc makes the system very usable, Neodesk 3 having many features that Apples and the like have not.

Snags

As time goes on, all those deleted files start to cause problems as new files get 'fragmented' when they are saved. This problem shows up in a gradual slow-down when loading and saving. It can be reduced by having lots of small partitions on the disc, but it can still be a nuisance. Restoring from a back-up is no cure as most fast back-up programs simply restore the disc as it was, fragmentation and all. I have yet to come across a reliable program to de-fragment a disc. It must read the files into memory and then shuffle them around: any corruption and the entire partition will be lost! If anyone has such a program please let the ST Club know.

ST-E

The ST-E caused horrendous confusion and problems with hard discs. Atari refused to help anyone without a proper Atari Megafile even when it was shown that it was really their fault. The problems seem to be due to bufferring the DMA lines, and a bad batch of DMA controllers. The Atari line is that only a very small number of machines were affected. In my experience *most* early machines are affected, but only a few users have hard drives. The moral must be - beware a second hand ST-E if you cannot see a hard disc working on it for at least 8 hours.

TT

Atari have actually incorporated the SCSI controller into these machines. This means that any SCSI drive unit can be plugged in - or so we hope. As Atari do not make their own units, problems like the ST-E DMA one should not happen.

DIY?

In order to make up a hard drive system for an ST, a controller, power supply, case, drive and fan are required. When these items are priced it can be seen that for small drives it's not really worth it. The advantage comes with larger capacity drives as it is on these that the manufacturers make most of their profits. Look through a magazine like 'Computer Shopper' for prices of bare SCSI drives.

Example pricing

SCSI controller	£70
PSU	£30
SCSI Drive	£250 upwards
Case	£30
Fan	£15
TOTAL	£395
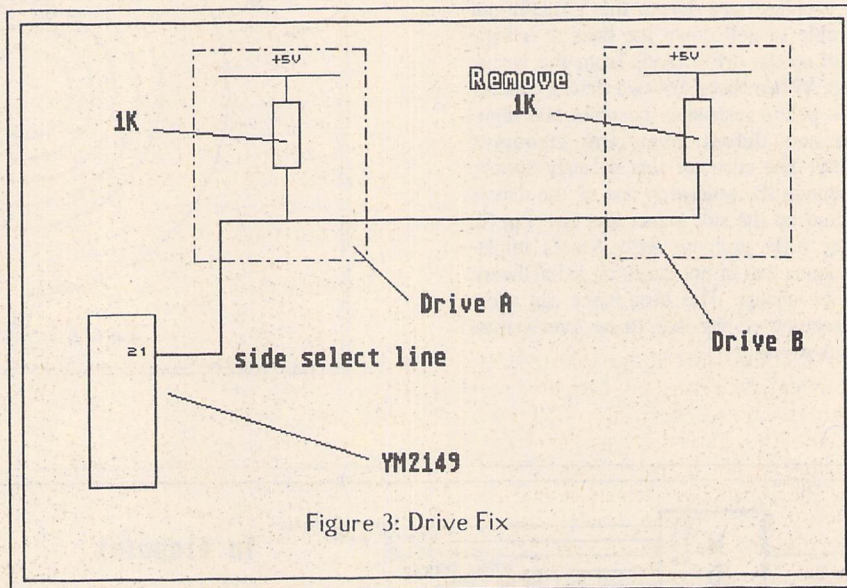
Figure 3: Drive Fix

Common Disc Drive Faults

No drive icons on desktop	Defective drive, no index pulses
Zero items in disc window	Defective drive or memory manager
Motors not spinning	Broken disc detect switch in drive
Data corruption	Dirty drive heads
Some discs will not read	Heads out of alignment
Some games will not load	Drive meets spec. but not good enough for heavily protected games
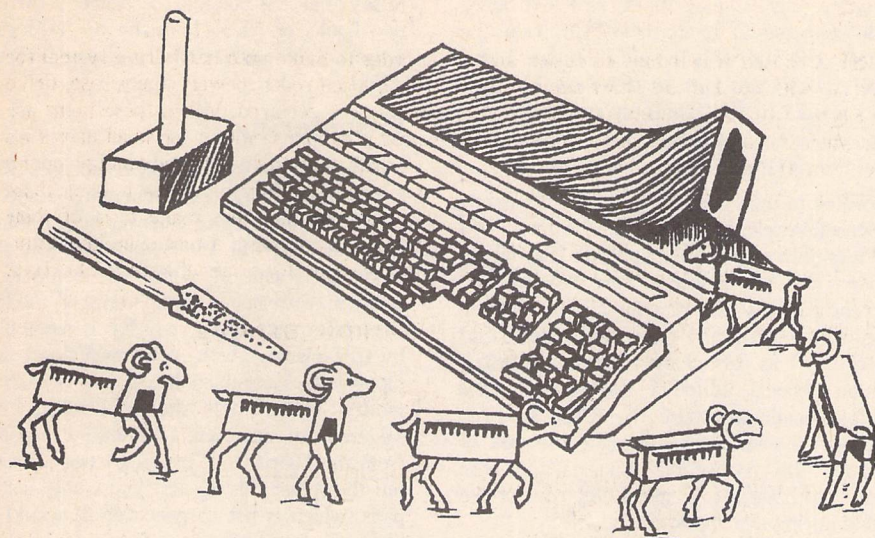
Derryck Croker takes a look at some of the hardware upgrades available to the ST user.

More Upgrades

TOS 1.4

Most people, once they've passed the beginners' stage, begin to hate that item selector. Especially annoying is the requirement to manually edit the top line to reflect the drive letter from where a directory listing is required. Many PD and commercial replacements exist for this dreaded selector. All use vital memory, take time to load, and aren't always compatible with all programs, for example even the respected UIS doesn't work with HiSoft's C interpreter. TOS 1.4 offers a button for each drive on line, so a new directory is just a mouse click away. And once the plunge has been taken and a hard drive is added to the system, more patches need to be added, most especially the 40 folder bug fix. If more than 40 folders have been accessed in a session then the memory cache set aside by TOS becomes full, and earlier entries become overwritten. Ever wished for a reliable method of auto-booting Gem programs? "Install Application" now allows you to set such a program to be self-loading, save DeskTop.Inf and reboot to make it take effect. If you can recognise a long-felt need in any of this, then you may need TOS 1.4.

Your ST, once stripped down to the main PCB, will show you what you need. Somewhere on the left, perhaps under the power supply, you will find either a row of six chip sockets or two sockets and solder pads for the remaining four. Fortunate owners will have the former type, which can be subdivided as chips in all sockets or just two with the remainder empty. Replacement chip sets are available as either two or six ROMs from various sources, but Paul Rossiter's are probably the most keenly priced and are correctly packaged in conductive foam. This six

chip set is a simple chip-for-chip plug-in job, ensuring that they match the legends printed on the PCB, L0-2 and H0-2. Hint-Tandy sell two tools which will be found to be of great help when removing and installing this type of chip. The first is an IC inserter/extractor 276-1581, and the second is an IC pin aligner 276-1594. These really do make for better results, avoiding the necessity of prying chips out with screwdrivers (thus damaging PCB tracks), or using the edge of the table to level up the chip's pins! And do please label the old ROMs on removal.

One more task if replacing a two chip set is to move three solder bridges adjacent to the sockets from the 1M position to the 256K. This allows the lower per chip memory capacity to be recognised and does not affect the operation or memory capacity of the ST! The less fortunate owner will have to desolder the holes and then install four 28-pin chip sockets before plugging the new ROMs in. See the end of this article for help with desoldering.

I found other benefits with the new ROM chips too. Not only are disks now formatted closer to the IBM standard, but file copies now need far fewer disk swaps than before. And a small benefit: the memory capacity of the ST is increased by 15,450 bytes. It is strange, is it not, that in the days of the good ol' 8-bit that 15K would have been sufficient for virtually all of the 130XE's Operating System, or even TWO Atari Basic cartridges!

Blitter

This 68-pin chip contains replacement routines in hardware for the BITBLT algorithm used in the line-A opcodes using DMA (Direct Memory Access). That's what it says

in the book. What it means to you and me is that programs that move areas of memory around now work much faster. Since that also involves screen operations it means that graphics and word processor packages offer much faster screen updating. There are software implementations such as Quick ST, but these aren't always successful; indeed, after loading one such and then an application, I was told that there was no memory left! My blitter chip is so far compatible with every program that I have thrown at it, and as intimated the machine is now much more pleasant to use.

Again these are available from various sources including Paul Rossiter, and installation is a matter of removing the solder from 68 pads and from links W3 and W4 (if your ST has them) and then soldering the PLCC (Plastic Leaded Chip Carrier) socket into place. Exactly where these pads are located will depend on your particular machine, but in any case it is my belief that only TOS 1.2 and above will allow use of a blitter. Therefore always check the configuration of your ST before ordering this or any other upgrade with your supplier.

Once installed you will find a new entry in the "Options" menu of the desktop. A tick next to the Blitter entry will show it is switched on, and saving the desktop will set whatever state is chosen as a default.

NeoDesk owners can find a similar facility in the Control Panel accessory.

A word of warning about these PLCC chips. They are difficult at best to remove without special tools, so be very, *very* careful to orientate both socket and chip correctly. You won't get a second chance! Refer carefully to your supplier's instructions first.

3 from 2.5

When I installed my 1 Meg upgrade I unwisely didn't fit sockets for the additional memory chips. When I felt that I needed more memory I fitted Frontier Software's XTra RAM board, and part of the installation required the disabling of this bank of RAM. There was no way that I could remove the chips without damaging them, and so I resigned myself to an unusable 512K of memory. Now if this feels familiar, then read on...

From ST Magazine comes "3 from 2.5". Translated from German by Peter West (Forum, STA 3), this is an article with accompanying circuit that is easily built onto VeroBoard that will allow this bank to be brought back to life, and without the need for any software drivers. Peter's translation is excellent and the article has sufficient levels of information to suit the requirements of most people without getting bogged down.

This project is not for the faint of heart though. The main requirement is to reconfigure the add-on RAM board from bank 1 to bank 0, and this is made tricky since the MMU clip picks up the control signals direct from the MMU. The guide that follows is specifically for the XTra RAM board, but armed with this and the article in question you should be able to adapt to other systems with a little lateral thinking.

For example, you may be able to extend the ribbon cable from the clip with an IDC plug and socket to allow interception. In all cases an eye must be kept open with a view to returning the ST to normal, just in case, and of course your guarantee will be voided. Neither Peter West nor ST Applications (the present writer included) can be held responsible for any damage. Neither are we able to answer questions arising from this project.

Homily over. Unplug the XTra RAM board and strip the ST to its main PCB. Take the MMU clip and with the aid of figure 1, cut the tracks from pins 18 (RAS 1), 21 (CAS 1L) and 22 (CAS 1H). These run to the ribbon connector pins 12, 11 and 1 respectively. Put the clip to one side.

Turning to the main board, all the necessary connections can be easily found with the aid of a multimeter and the diagram. However, I found that the resistors were labelled differently on my ST. Of course, two of these resistors will already have been located and tied to +ve as part of the RAM board installation process. Remove the clip-on leads before continuing. Also the RAS0 line ran through a resistor, which made the task of cutting this connection easier. It's a wise move to have a few spare 68R resistors to hand during this operation.

Once the connections to the new circuit have been made, connect leads from the lifted ends of the CAS0 L and CAS0 H resistors and solder to the MMU clip pin 11 (CAS0 L) and pin 1 (CAS0 H). Run the RAS0 connection to pin 12, at which point your RAM board is now configured as bank 0. The final step is to pick up the A9 signal for the new circuit from pin 14. These pin assignments are those of the ribbon connector. Do not solder to the MMU pins or they will fall out!

Finally, check your work very carefully before plugging in the RAM board, and do be careful when choosing a place to fit the new circuit. The place I chose (just in front of the video shifter box) interfered with the central keyboard support post extending up from the case bottom.

All in all, then, a worthwhile project which works well but needs some care in installation plus a certain amount of interpretation. And if 3 Meg isn't enough, the article goes on to say that it is possible to connect a further two banks of 512K to make up 4 Megs - provided, of course, that you can find the room!

Desoldering

Much of this article has concerned itself with unsoldering things. Even currently unoccupied holes need solder clearing before things can be soldered in. Ever wondered why this apparent waste of time and solder? In common with many other items of modern electronic equipment, your ST is assembled by first placing all the components and then dipping the assembled board into a bath of molten solder. All the connections are soldered at once with the solder repelled from the board itself by its coat of varnish, but the solder fills up all those empty solder pads, which is not so good for us would-be hardware hackers!

Removing this excess solder is a task that requires a desoldering pump, which is a spring-loaded piston inside a tube that has a heat proof tip at one end. The plunger is pressed down and is held in place by a catch which can be released with a button. Once released the plunger springs up, creating a vacuum which sucks up the molten solder which is expelled when repriming the pump.

The watchword here is speed. The solder quickly solidifies and so if the pump isn't placed correctly it will not work. I've found that the best method to use is to hold the primed pump upright on the offending pad and then tilt it away to allow access for the soldering iron. Once the solder has melted, remove the iron, return the pump to its upright position resting on the pad, and release the catch all in virtually one motion. Make sure that the bit is clean and freshly tinned, and sometimes a little extra solder on a pad makes for easier extraction. Never overheat a pad. If it doesn't clear in one go, move on to another and return to it when it has cooled down. Overheating the pads causes the risk that they will lift away and break.

Practice makes perfect, and so it's worth trying your new found skills on, for example, an old computer panel which can be obtained from surplus stores. Don't be tempted to practice on the family VCR. Not only will you not get it back together in time to record East Enders, but the cat will bat a vital component under the sofa!

TOS 1.4 and Blitter chips can be obtained from Paul Rossiter, whose advertisement will be found in this magazine.

The translated "3 from 2.5" article is available from:

Peter West

38 Woodfield Avenue

LONDON

W5 1PA

Please send 75p in stamps - Peter prefers small denominations - to cover photocopying and postage costs.
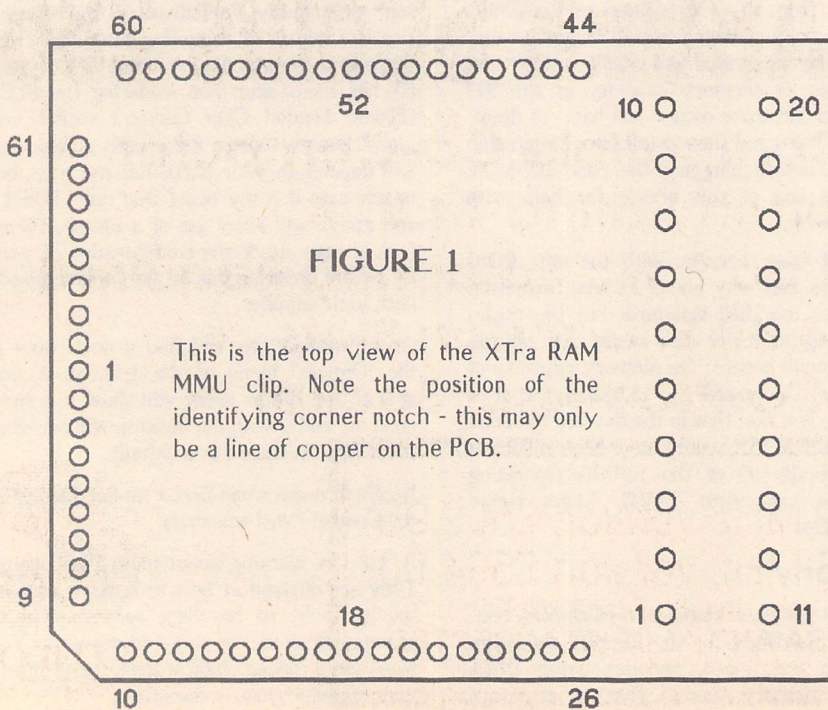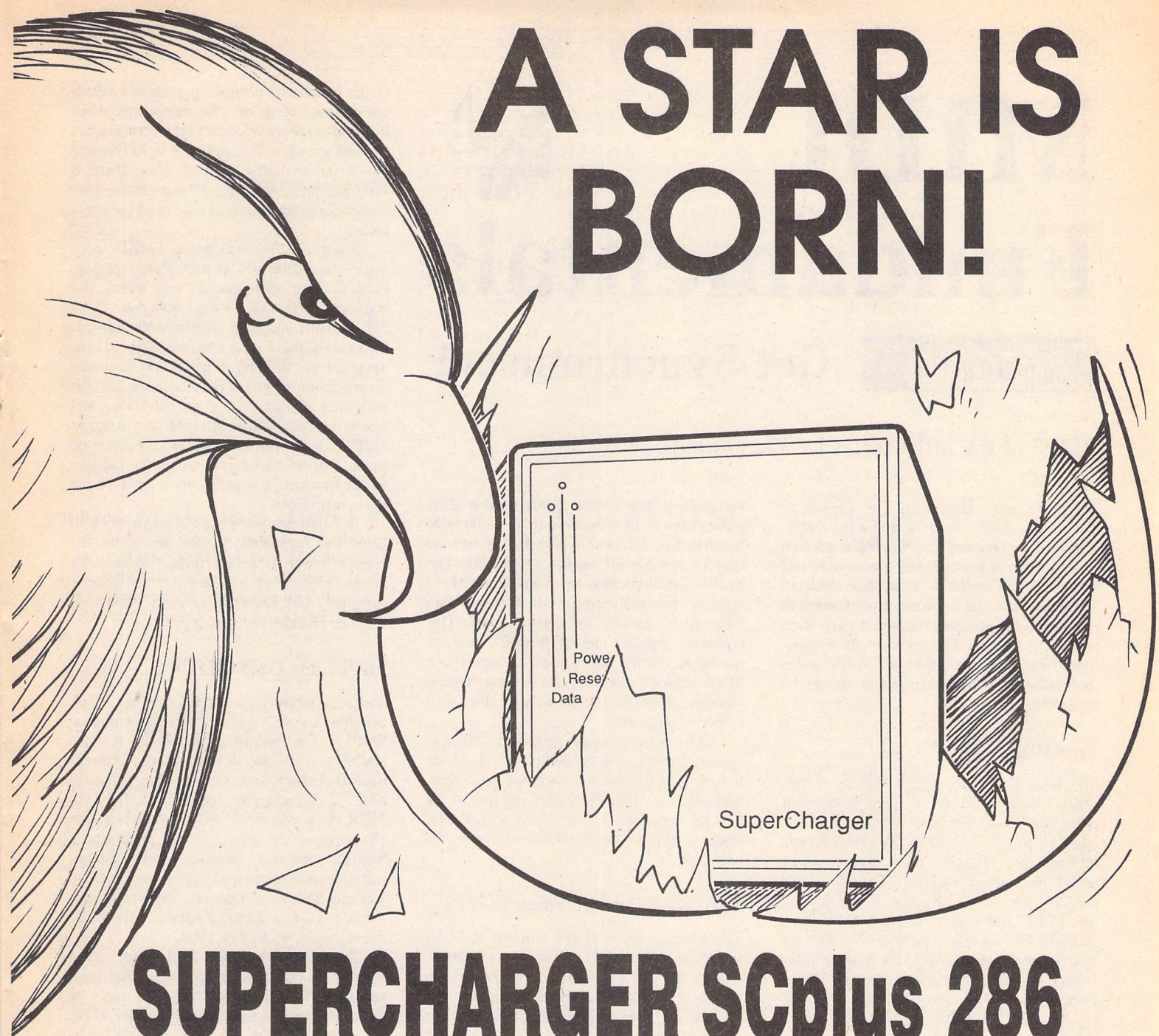
FIGURE 1

This is the top view of the XTra RAM MMU clip. Note the position of the identifying corner notch - this may only be a line of copper on the PCB.

MIDI Fundamentals

Get Synchronised!

Part 3 of the MIDI series by Vic Lennard

There are two main reasons for wanting to synchronise a tape machine and a computer. Firstly, there are never unlimited tracks on tape, and driving sounds via a computer and MIDI removes the need for all information to be dedicated to tape. Secondly, on recorders using narrow tape, bass frequencies are often adversely affected. Consequently, the recording of drum machine voices and synth sounds with substantial bass frequencies should be avoided.

Pre-MIDI

The easiest way to ensure that a system stays synchronised is to have a constant pulse sent out by one piece of equipment (the Master). Any connected devices (Slaves) will add one time unit onto their internal clocks each time a pulse is received. The slaves then stay in time with the Master. In the days of 'pre-MIDI', this was accomplished by using an audio click sent as a number of pulses per quarter note (ppqn). The slaves were often termed 'sequencers' because they played back a sequence of steps.

MIDI Clock

Once the MIDI protocol came to fruition in 1983, the name 'sequencer' became inappropriate. The devices generally became known as MIDI Data Recorders. Similarly, using a slow speed pulse was equally unacceptable. MIDI CLOCK (F8H) was defined as a continuous stream of timing pulses sent at the high speed of 24 times each quarter note (24 ppqn). As the inflow of MIDI Clocks are note-related, any tempo change will lead to pulses being a different distance apart. For instance, slowing down a piece of music will lead to notes being further apart, and so the rate of MIDI CLOCK transmission will also slow down. A START command (FAH) is sent when the play button is pressed and can be followed by a subsequent CONTINUE (FBH) or STOP (FCH) command.

Synchronising a sequencer and drum machine is no problem so long as one can transmit MIDI Clock and the other can recognise it. For a tape recorder, the MIDI pulses have to be encoded into an audio code because the bandwidth of MIDI is beyond that recordable on tape - 31.25 kHz. The method of encoding is called FSK (Frequency Shift Keying) which uses two frequencies, usually an octave apart. This normally requires an additional piece of hardware. As the Master device sending out MIDI Clock will also have any tempo changes programmed, these are effectively recorded onto tape.

There are two main problems with this system. Firstly, no alteration is possible to the tempo once the code is recorded onto tape. Secondly, the MIDI Clocks are relative to the START command which means that a song always has to be commenced from the beginning.

MIDI Song Position Pointer (SPP)

This keeps a count of the number of MIDI Clocks, in blocks of six, since the beginning of a song. So you can start the master in the middle of a song and all connected slaves will jump to the correct position as long as they can read SPP. After that, MIDI Clock locks the timing together as before. It has the format:

F2 LL MM - LL = LSB, MM = MSB.

With 14 Data bits, this gives a maximum of 1,024 4/4 bars.

Some manufacturers have managed to incorporate this within their FSK tape sync code. However, FSK also has a major failing. The frequencies used for the tape signal differ from device to device meaning that there is a lack of a standard.

Longitudinal Time Code (SMPTE)

The original use of a sync code was in the film industry for locking together two tape machines for editing purposes. As such, the Society of Motion Picture and Television Engineers (SMPTE) designed four formats which encoded actual time in hours, minutes, seconds and frames.

The only difference between the formats is the number of frames per second which varies depending on the application. For instance standard motion picture rate is 24 frames/sec while European TV is 25 frames/sec. From an audio point of view, there is little difference although the same frame rate chosen for record must also be used for playback.

From a MIDI standpoint, SMPTE provides a standard and as such there are perhaps a dozen different devices which will read/write SMPTE to tape and convert to MIDI clocks and song position pointers. Unfortunately, there is no universal way of converting from SMPTE to MIDI and so timing errors occur if you write the code to tape with one device and then playback, and hence convert, via a different one. Also, as SMPTE deals with absolute time, it takes no account of initial tempo and tempo changes which have to be keyed into a table within the synchroniser.

In MIDI sequencing we tend to work in beats and bars while in film and video the main criterion is actual time. Continuously having to convert between the two can be extremely tedious and practically impossible if tempo changes are taking place.

MIDI Time Code (MTC)

Various persons working within MIDI became aware of the need to embrace SMPTE. The essence behind MIDI is compatibility between devices from different manufacturers and yet synchronising to SMPTE requires the use of a SMPTE to MIDI clock converter with its inherent disadvantages, or the use of proprietary SMPTE hardware interfaces per software manufacturer - an expensive option for those working with more than one sequencing program. MTC was formally added to the MIDI Specification in October 1986.

An MTC generator reads and writes SMPTE to tape and creates the MIDI messages necessary to synchronise any piece of equipment (slave) which will recognise MTC. As it is effectively translating SMPTE to MIDI, any tempo information must be programmed within the slave.

There are two basic types of MTC message:

A QUARTER FRAME MESSAGE is used while the system is actually running and so is analogous to MIDI Clock. It has the format:

F1 DD - DD = 0nnndddd (binary)

where nnn is the message type and dddd is the value.

A FULL MESSAGE is used when the complete SMPTE time has to be transferred in one message and is 10 bytes long.

Other messages include: USER BITS (15 bytes) for those occasions when you need to send a special message through MTC - for instance, tape reel number or a date code: SET-UP MESSAGES (13 bytes) for MIDI cueing of punch in/out and cue points.

Next month - after the theory, the MIDI hardware for setting up a system.

UP DATE
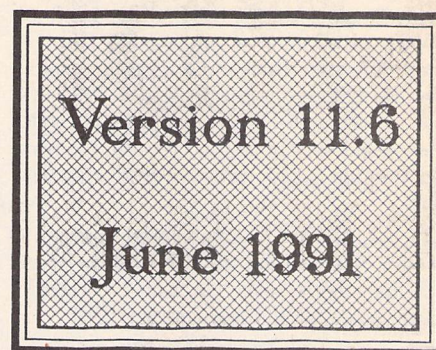
Demonstrations of Commercial Software

DEM.68: CodeHead Software Demos and Little Green Footballs Shareware. Demo's of: CodeKeys 1.2, G+Plus 1.0, HotWire 2.3, LookIt! & PopIt!, MaxiFile 2.0, MIDIMAX 1.2, MultiDesk 2.1. Most of these demo's have 10-minute time limits or limits on the number of facilities that may be used. Shareware items on this disks: ArcShell 2.1b, the ArcShell documentation, ARC.TTP, and LHARC.PRG; Desk Switch 1.1; PinHead 1.8; TopDown 2.7; CodeHead's "Eleven Commandments" - guidelines for writing software for compatibility; Desk Manager 3.3; Little Green File Selector 1.8C. (DS)

Educational

EDU.32: BODYSHOP - helps students learn Human Anatomy - the names and locations of all the major bones and organs of the body are taught using both common everyday terms and the more technical medical terms; **MATCH** - A game of snap, played against an opponent, or computer opponents with varying degrees of difficulty (C).

Fonts

Futur Gem Font:

The first two disks (FON.59 and FON.60) have the font files compressed by the Trimfont utility supplied with the most recent version of Fontkit Plus.

FON.59: FUTUR GEM font for High Res screen (90-dpi) and 360-dpi printer. Standard Futur in 7, 10, 12, 15, 20, 24, 30, and 32 point; plus a shadowed 26-point and 3D 27-point. (DS)

Futur @ 38-point

Futur

Shadow

FON.60: FUTUR GEM font for High Res screen (90-dpi) and 300-dpi printers (laser and DeskJet). Standard Futur in 8, 12, 14, 18, 24, 28, 36, and 38-point; plus a shadowed 31-point and 3D 32-point. (DS)

These font files are also available uncompressed:

FON.61: Futur GEM @ 90-dpi and 360-dpi at 7, 10, 12, 15, 20, 24, and 30-point. (DS)

FON.62: Futur GEM @ 90-dpi and 360-dpi at 32-point; plus 26-point Shadowed and 27-point 3D. (DS)

FON.63: Futur GEM @ 90-dpi and 300-dpi at 8, 12, 14, 18, 24, 28, and 36 (DS).

FON.64: Futur GEM @ 90-dpi and 300-dpi at 38-point, plus shadowed 31-point and 3D 32-point. (DS)

Games

GAM.167: LLAMATRON, a great 'commercial quality' Shareware release by Llamasoft. The games is, to quote the author: "a fast-action arcade-style game guaranteed to have your fire button finger dangling off at the tendons! '90s ultraviolence in its very essence! Hours of fun for you (and a camel-friend if you like) blowing away horde after horde of alien fiends in the comfort of your own personal environment!" (DS:C)

Graphics

GRA.135: FUTURETIME II: STRANGE WORLDS by Neil G. Donnan. A collection of Cyberstudio films of imaginative worlds. In each world there are novel situations, devices, and artefacts. No explanation of the purpose or function of these is offered: rather, it is hoped that they will be be regarded as stimulants to the viewer's imagination so that he or she may ascribe purposes and functions of his or her own devising. (DS:1Meg:C)

GRA.136: FRACTAL CHAOS: super-fast fractal generator. (C)

Information

INF.30: ST Programmer Volume 1.

INF.31: German to English dictionary - over 18,000 word pairs in a set of ascii files. May be incorporated into Translate (DMG.22) for rough semi-automatic translations of German text files. (DS)

INF.32: The English to German versions of the files on INF.31. (DS)

INF.33: The JARGON FILE - collection of computerese slang terms.

Midi

MID.50: Kandinsky Music Painter - creates Midi music from pictures - use a graphics editor to produce lines, circles & arcs that will be turned into a piece of music (M); MIDI MAGNET - a desk accessory that captures Midi output from other ST programs and saves it as a Midi file - this demo version has a file limit of 8K.

MID.51: Midi Music Maker v1.61 - Loads and plays various Midi data format files and can save data in the standard Midi format. Handles: Music Studio, Music Construction set, EZ Track, Standard Midi files, Sid Player Music, Master Composer, Advanced music System, Midi Music System, Orchestra 85/90 & Lyra 1&2 (C). MIDI FILE - various Midi format data files.

Doubled Up

MUD*53:.........MID.50 + MID.51
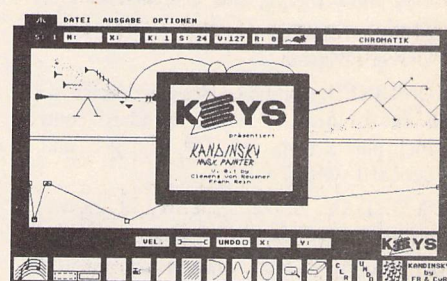
Utilities

UTI.113: DosAcc update: Screen inversion button for full compatibility with MaxiDisk, plus some minor adjustments so that the file displays are sorted more quickly. (DS)

UTI.156: SUPERBOOT version 7 - Update of this excellent boot-up utility now includes: playing of digitized sounds; Function key settings can be modified from within the SuperBoot startup screen - no longer any need to re-run the configuration program to change the F-key settings; an "Attention Bell" can be set to indicate that SuperBoot has loaded; and you can force Date and/or Time entry for a function key.

UTI.161: GEM CALC: Two versions of the Gemcalc spreadsheet (that first appeared on DMG.21) that will now run on a 520 ST. The main difference from the original version is that the 520 version is restricted to 100 rows and a maximum of 26 characters per cell. The second version on this disk uses the normal desktop colours rather than the pre_set ones.

UTI.162: GEM CALC: all three versions - two for 520's and the original (DMG.21) version for 1040's; plus the full GFA Basic source codes for all three versions. (DS)

Word processing

WPR.81: WORD SOLVER - find solutions to word-find style puzzles and anagrams - comes with a 25,800 word dictionary; COM WORDS - counts words in a file and then prints them in descending order of frequency; ASCII-fier and TWin pEAKS - see description in DMG.23 section.

Disk Mags

DMG.22 (March 1991)

ART ST: v2.32 - Paint program that works in all resolutions; options include: draw, fill, square, line, circle, pixel edit, cut, paste, magnify, and fill patterns can be edited. Loads and saves Degas and Neo files.

BACKUP ST v1.0: hard disk backup program with a wide variety of options, full documentation, and a GEM interface to make the use of the command line a lot easier.

BROWSE: Utility for moving around directories, and browsing their contents. ($C)

CCMOD: Modified versions of the Sozobon C driver program.

COMBINED: Combined desk accessory with all the features of Atari's standard control panel, plus a ram disk, file manager, and a keyboard symbol editor.

DATE2DAY: Displays the day of the week for any given date. ($C)

DC SHOWIT: File viewer replacement for the standard Show/Print/Cancel Atari affair. (Not TOS1.4+)

DC SLICK SHIFT: utility to emulate the mouse button actions from the keyboard. The author originally wrote this because his STacy's track ball was giving him hand cramps.

DIAMOND FIND v1.0 - A very good file finder utility - easy GEM interface and straightforward to use. ACC and PRG versions supplied.

DISPLAY: Revenge Document Display Program - very powerful and fast text file reader. ($HiSoft Basic)

DSKCHK2: Floppy disk checker - checks that the disk is intact, displays boot sector

information and whether or not the disk is executable. ($C)

DTERM: VT52 emulator, to replace the ST Term supplied by Atari; contains many more features than ST Term.

EDISK21: Re-set proof RAM disk.

GOGO ST v2.1: file selection utility - Gogo ST is intended as a fast way of executing files, instead of searching through folders for executable files. Ideal for use with hard drives.

IMG_DEG: loads an IMG file, displays it, then allows it to be saved as a Degas PI3 file.

IS GDOS: simple program to check wether or not GDOS is loaded. ($C)

LISTINGS: Programmers' Forum listings from issues 2, 3 and 5 of ST Applications; plus the files to accompany the first three 'Giving it the WERCS' articles.

RACING: files to accompany the 'Horse Racing Spreadsheets' article published in Issue 3 of ST Applications. It is a bit different from the usual boring computer rubbish: this could change someone's life! The spreadsheets files are for use with Kuma K-Spread 3 or 4.

STATS: Statistician - reports on disk and memory usage plus system information.

ST TYPE: Displays information about your ST: TOS, GEMDOS, AES versions, Nationality, memory size, and whether or not a Blitter chip is fitted. ($C)

TRANSLAT: A German to English translator, for use with resource files, binary files, text files, etc. Any words not recognised are put into a separate file, so that the dictionary can be updated.

UNLZH v1.72 - The LHARC version of ARCX. A very fast unarchiver. Written entirely in assembler. Possibly the fastest unarchiver on the ST.

DMG.23 (May 1991)

ACCFLDR: allows accessories to be loaded from a folder called ACCS on the boot drive.

ARCDRIVE: system patch which compresses files as they are saved to disk, and automatically uncompresses them when they are reloaded.

ARC SHELL: version 2.1 of this GEM shell for file archiving utilities, plus ARC and LZHArc.

ASCIIFY: converts First Word files into ASCII files. Includes options for hard carriage returns either at the end of each line (TXT files), or only at the end of each paragraph (ASC files).

AUTOSORT: sorts the order of execution of PRG files in your AUTO folder.

AUTOFIX: Allocates the first 512K of memory with a TSR program to allow some "AUTO" programs to be run from the desktop as TOS files. (Needs 1Meg RAM+).

BOOT: Allows you to install any one of 8 bootsectors.

CAL_47: a calendar program with a difference - it lets you attach 'events' to any
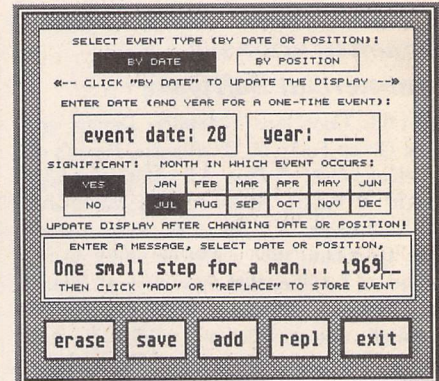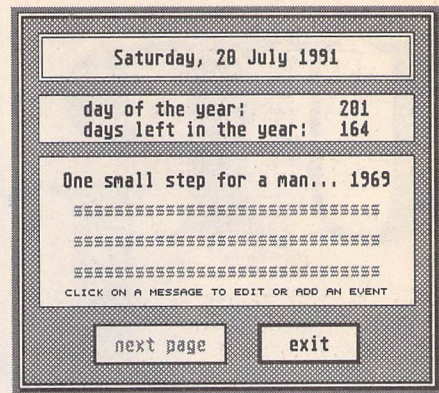
day of the year, either by date or according to a day's position in the month. When Cal loads, it reads the current date from your system clock and checks to see if any significant events are scheduled for the day. If so, Cal displays an alert that shows you the day's events.

CANNON_BJ: 1st Word Plus printer driver for the Cannon Bubblejet.

CMDMENTS: A Programmer's Eleven Commandments for Coëxistent Vector Stealing. Or: Tried and True Techniques Used by the CodeHeads for Successfully Intercepting Vectors in the Midst of Numerous ST Vector Thieves. By John Eidsvoog and Charles F. Johnson (CodeHead Software).

COL_PRT: Degas printer drivers for: Radio Shack CGP-220 colour inkjet printer; Epson JX-80 colour printer; NEC Colour Pinwriter P2/P3; Canon PJ1080A colour inkjet printer, Okimate 20 colour printer. Includes an accessory that allows these drivers to be used to make ALternate-Help screen dumps.

DCDISKINF: DC DISK INFO v1.0 by Double Click Software. Gives a quick 'snapshot' of any disk: visual representation of the file allocation on your disk, plus some statistics about the disk.

DCFLIGHT: DC Floppy Light from Double Click Software - installs a routine into the read/write vector (RWABS) of storage devices: floppy disks, hard drives, ramdisks, etc. Each time such a device (with the exception of the floppy drive) is accessed, the floppy drive A light will come on until the operation is finished.

DCMAXTRK: DC MAX TRACK from Double Click Software - checks how many

```
┌─────────────────────────────┐
│   DC Max Track v1.0         │
│                             │
│     by Keith Gerdes         │
│                             │
│  Drive A:    Drive B:       │
│  ┌──────────┬──────────┐    │
│  │          │          │    │
│  └──────────┴──────────┘    │
│       Maximum  84           │
│  ┌──────────┐ ┌──────────┐  │
│  │ Test It! │ │  Exit    │  │
│  └──────────┘ └──────────┘  │
│ NOTE! To abort,hold down 'Alternate' Key │
│ Copyright (c) 1991 Double Click Software  │
└─────────────────────────────┘
```
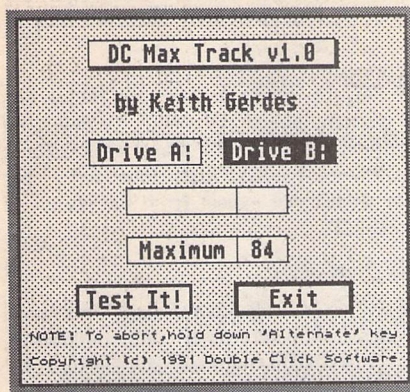
tracks a floppy disk drive can safely format.

DESKSWIT: Desk Switch v1.1: The Ultimate Read-Only Control Panel By Charles F. Johnson. Lets you instantly switch from one desktop setup to another. Desk Switch reads .INF files created with the GEM desktop's 'Save Desktop' function, and sets every parameter saved in the file.

DFORMAT: Diamond Format V1.0 - Formats 1 or 2 sides, 80 or 82 tracks, twisted or normal format, and 9,10 18 or 20 sectors per track (the latter for high density 1.44/1.6 meg drives), creates disks compatible with the Apple File Exchange utility, verify or no verify.

```
┌─────────────────────────────┐
│ ◆   Diamond Format V1.0   ◆ │
│         (C)1990 Robert D. Luneski │
│                             │
│ Sides:   [Double] Single  [Verify] │
│ Tracks:  [80]     82      [Zero]   │
│ Sectors: 9 [10] 18  20    [AFE]    │
│ Format type: [Twisted] Normal [MS-DOS] │
│ Floppy A:  Waiting        [About]  │
│ Floppy B:  Waiting        [Help]   │
│ Format Drive:  [A]  [B]   [Exit]   │
└─────────────────────────────┘
```

DISCPLAY: The Disc Player - replays ST-Replay .SPL compatible sound files of up to 910K on a 520ST. Replays samples at 5KHz, 7½KHz and 10KHz; the program will read the data off the disc and play it, using less than 30KBytes of memory!

DSKCH32A: Disk Chart Version 3.2 displays hard drive partition space with a bar graph and and report option.

EASYVIEW: EasyView - utility for for looking at text (ASCII) files with user definable handling of Tabs.

ENVIRON: Sets desktop environment (like PATH, HOME, and other things for shells) from the AUTO folder.

FASTGIF: converts Gif picture files into Degas PI1 format.

FMC: Forces a "Media Change" so that the ST will always read from a disk before writing to it. Overcomes the problem with some computers/disk drives that have have faulty write-protect lines, and do not detect when a disk is removed.

```
┌─────────────────────────────┐
│ ✋  FormDoIt! v. 1.0a        │
│    Colaware, by Dan Wilga    │
│    © 1991, Gribnif Software  │
│           [Ok]               │
└─────────────────────────────┘
```
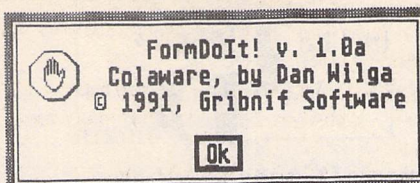
FORMDOIT: FormDoIt! version 1.0 by Dan Wilga. Extends the GEM dialog manager so that dialog boxes may have keyboard shortcuts and adds a number of extensions to the way editable fields are handled.

GDOS_SEL: select whether GDOS is to be loaded at boot up.

GIF_VIEW: GIFcolor & GIFscale: Two Very Fast GIF Viewers: GIFcolor - uses the 16 most popular colours in the image; plus GIFscale - maps the image to grey and tinted scales.

LISTINGS: source code listings from Programmers' Forums in Issues 6 and 7 of ST Applications; plus the source codes and programs that accompany part 4 of the HiSoft WERCS articles.

MMR: utility for midi printout, filter and channel controller functions.

MORECOPY: MoreCopy is a short utility to enable users of 1stWord, or most other utilities, to produce multiple copies of a single document without having to repeatedly go through the print routine ($C).

OCULT: password protect your system.

PBUFFER: printer Buffer/Spooler.

PINHEAD Version 1.8: a tiny program that will drastically reduce the amount of time it takes to boot your computer, especially if you have several AUTO programs and desk accessories installed.

POP_UP: a popup menu system for all Atari 'C' programmers to use. Popup menus can be called up on demand, or used as a replacement for the standard GEM top menu bar, or both. Features include: A help string may be displayed with each menu item; Sub-menus to any depth are supported; Related options may be grouped together within sub-menus; Powerful editor supplied with this package allows easy modification of menu definitions.

PRINTSET: a simple little accessory for setting up Epson compatible printers for A4 sized paper.

P_MOUSE: Proportional mouse accelerator Accessory that gives you 3 speeds and 4 multipliers so that you can configure it to suit.

RESETCOL: resets the desktop colours ($C).

SATTRIB: a short file attribute modifier which can be used to hide or protect files. Options include: Read only, Hidden, Archive, System, Normal, View current. Wildcards are allowed.

SILLY: selection of novelties. **DJANGO** - kills your ST; **FUJIDESK** - puts a spinning Fuji logo alongside the Desk menu; **MAGIC** - sets up a magic cursor that is followed by a trail of stars; **PHYSICAL** - bouncing cursor with sound effects.

ST2PC: program for making floppy disks formatted on an Atari ST readable on a PC. ($C)

ST_DATA: gives details on the type of ST and its configuration setup. Reports on: TOS Version, ROM Date, GEMDOS Version, AES Version, etc. ($C)

ST_TYPEW: ST Typewriter - 'working demo' of a utility that works a little like a typewriter, allowing you to print each character as you type.

SYSBEEP: replaces the system bell 'sound' with a sound sample.

TABKILL: Tab Kill - replaces tab characters in ASCII files with spaces, supports wild cards for batch converting. ($C)

TAP_MAKR: Tapita Maker: makes labels for music cassettes.

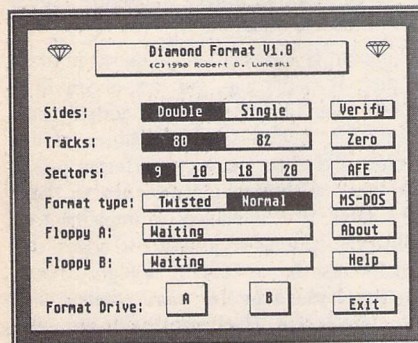**TB_FIX:** This program is designed to cure a few known bugs in the TEXTBLIT function. This part of TOS handles the output of GEM bit-mapped fonts on a display, the bugs mainly concern the way in which wide characters (more than 16 pixels) are handled.

TWEAKS: TWinpEAKS, this accessory provides a neat way to tweak your printer - sending commands and control codes to it. Up to eight printer functions or modes are instantly available at the click of a mouse. Sets of eight definitions can be saved as .TWK files, and loaded from disk at any time. ($C)

XDIR: Xdir, The Extended Directory Lister: a utility to display either the entire contents of selected floppy or hard disk drives, or the contents of selected folders. ($C)

Note

Disks DMG.22 and DMG.23 are double sided. In order to get onto the disk the maximum number of programs (over 1.4MBytes of them) all files have been archived. When un-compressed contents of DMG.23 will occupy 1,599,488 bytes! A suitable trouble-free un-ARCing program and full instructions are given on the disk.

Ordering

You can order these Disk Mags in the same way as all other PD disks - see our Order Form on page 57 of this magazine. ST Applications magazine subscribers can subscribe to the ST Club Disk Mags at a rate of £7.50 for a 6-disk subscription. Disk Mags are issued bi-monthly and are mailed under separate cover from the magazine.

KEY

(M) - Runs in High Resolution Mono.

(C) - Runs in Medium or Low Resolution Colour.

(DS) - Double-Sided Disk

(1Meg) - Needs one megabyte of RAM.

(Not TOS1.6) - Will not run under TOS 1.6 (STe) or TOS 1.4 (most recent STFMs).

($) - source code included.

($C) - C language.

($ASM) Assembler.

Doubled Up: With the exception of a few specially formatted disks, all single-sided disks in this catalogue are now available on double-sided disks. Doubled-Up disks have a disk code in the format: AAA*NN. All PD disks are the same price - there is no surcharge for double-sided disks.

Copyright: To the best of our knowledge everything on the disks in this catalogue may be freely distributed. If you know otherwise please let us know and the offending software will be immediately withdrawn.

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Ordering Details

Please note that we do not accept orders by credit card. Orders accompanied with a cheque or postal order are dispatched by 1st Class post on the day we receive them.

All PD disks are copied onto high quality disks from known manufacturers. The price you pay us for PD disks covers only the costs of acquisition, duplication, cataloguing and distribution.

Disk Prices

PD Disks: Standard and Doubled-Up disks.

	up to 6	7+
Non-Subscribers	£2.80	£2.50
Magazine Subscribers	£2.50	£2.25
Disk-Mag Subscribers	£2.35	£2.05

Licenseware disks cost £2.95 or £3.95 each.

All prices include VAT at 17.5%, packing and 1st Class post.

In The Public Domain

Reviews by Sandra Vogel

Fractal Chaos

Fractal graphics programmes have been around now for quite a while, and you might feel justified in thinking that there was nothing new they could offer. Well, think again, and take a look at this little beauty, which was produced in Australia. The programme's author has been producing fractal programmes for many years, initially on Atari 8 bits! Now, using the ST, and working in GFA Basic, the author has been able to explore the possibility of increased speed, and Fractal Chaos works at an incredible speed - certainly faster than any other generator I have seen. Moreover, you are not stuck with that familiar Mandelbrot set as a starting point for your examinations - there are a number of Julia sets provided too. If all this sounds a bit technical, don't worry. Fractal Chaos will suit beginner and expert alike.

The standard features of programmes of this type are all present, but this one contains some useful additions, such as the facility to recall the nine previous screens, and their iterations, a palette editor, saving to Degas, and a useful preview mode which provides you with a tiny, quickly generated version of the full picture you want to get - saves you the bother of waiting for several hours to generate a very pretty, er, black screen!

FormDoIt

This handy little programme can be set to run from your auto folder, or run as a stand alone if you prefer. Having loaded, you will be presented with an apparently unchanged ST - but the first time you encounter a dialog box you will see what FormDoIt has gone and done! This programme alters one of the parts of the ST's infamous operating system which we have all yelled at at one time or another - the dialog manager.

For example - ever wished you had more control when using a dialog box with editable fields? FormDoIt allows you to use any available characters for file names (not just 1-10, and A-Z). Ever wished you could have more than the one default button in a dialog box? FormDoIt has enabled the 'Undo' key to search for any of 'Cancel', 'Quit', 'Abort' or 'Exit'. Ever felt the need to dispense with those tacky pictures in the alert boxes? FormDoIt allows you to use your own Degas format graphics in alert boxes.

But perhaps the most impressive feature of FormDoIt is the way in which it assigns keyboard equivalents to dialog box options. This removes the need to keep reaching for the mouse to make selections - something many ST users find incredibly frustrating. FormDoIt automatically selects a letter from a dialog box option as a hotkey, and underlines the relevant letter on screen. A press of Alt and the letter, and you have made your

selection. Up to 20 of these per dialog box can be accommodated - enough for any box I can think of. All of the above makes for a much more friendly 'user interface' - but what would you expect from the author of Neodesk?!?

Jargon File

Jargon File is a collection of slang terms used by various subcultures of computer hacker. Not, at first sight, the most riviting topic for many of us. But with almost two double-sided discs full of information, much of it in the form of anecdotes, the disc makes for very interesting general reading as well as providing answers to many a question.

The data on the disc is organised in small alphabetically arranged files, which are read via a well implemented text reader. Three appendices cover the additional topics on which more information is deemed appropriate than can be given in the main body of the discs. The first of these discusses hacker folklore, on areas in which there has been a degree of mystery like the actual meaning of the work 'hack'! The second gives a portrait of J Random Hacker, a stereotypical hacker, which is a sort of caricature and very amusing. The final appendix takes the form of an annotated bibliography, outlining some recent works in the area.

The amount of information contained in these two discs is staggering, yet disc access time is good - even from floppy. The added facilities to get printouts, to conduct string searches, and to set marks at different points in the text so that you can return to them easily later are intelligently implemented. Finally, the writing style is a cut above the usual for disc-based text. It is highly readable, and lacking in the usual spelling and syntactical errors which can easily put readers off, no matter how wonderful the content.

The original Jargon File was started by a Stanford hacker in 1975. Since then it has passed through various guises and hands, to reach its present form. I, for one, would like to see it prosper.

Software for this month's column was supplied by:

Budgie Licenceware, 5 Minster Close, Rayleigh, Essex, SS6 8SF

LAPD, 80 Lee Lane, Langley, Heanor, Derbyshire, DE7 7HN

Riverdene PDL, 30a School Road, Tilehurst, Reading, RG3 5AN

The South West Software Library, PO Box 562, Wimbourne, Dorset, BH21 2YD

Software in this month's column is also available on the following ST Club disks:
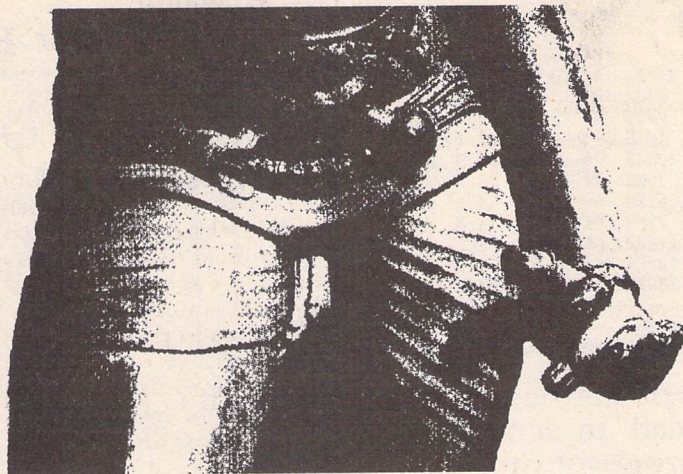
Fractal Chaos: GRA.136
FormDoIt: DMG.23
Jargon File: INF.33

Jeremiah's Journal

Splinterbone

*Millenium 2.2 is a game of space exploration and colonisation.
Jeremiah presents a comprehensive guide to
re-building civilisation as we know it.*

The game starts with the end of the world. A huge mass of ice hurtles in from Outer Space, collides with the Earth and punches a hole straight through the Pacific Ocean and into the planetary crust. The resultant catastrophe wipes life off the face of the globe within the space of a few hours.

As the Commander of Moon Base, you witnessed the event from the safe haven of Earth's satellite in a stunned and shock-filled silence. As the blue and grey disc that was once the home world slowly turns darker and darker, you find yourself imbued with a new sense of purpose and resolution. The Earth may be dead for now, but it can be rebuilt. Time and terraforming techniques can heal the damage done and bind up the mortal wounds suffered. Your task, as you see it, is to preserve the heritage of mankind while doing everything possible to bring about the resurrection of life on Earth.

Unfortunately, the resources of the Moon will not be sufficient on their own to accomplish the task. You will need to build spaceships and move out into the Solar System, so as to colonise new worlds and gain access to the mineral deposits they possess. By utilising these new materials, you will be able to develop further the assets of Moon Base, thus allowing increased expansion and, eventually, re-population of the Earth itself.

Millenium 2.2 is a nicely put together strategy game which is now available from several mail order outlets at a very reasonable price. Unfortunately, the game is cursed with one of the least useful instruction manuals I've ever seen. It amounts to just four A5 size pages, of which two are used to describe the scenario as outlined above, and one is used to give loading instructions on various computers, as well as advice on what to do if you encounter loading difficulties. This leaves just one page containing information with regard to the game layout and controls, which are covered extremely briefly. The result of this approach is to make it, initially at least, overly difficult to get to grips with the game. Indeed, I have known several players who have failed to get started at all, and finally put the game to one side virtually untouched.

This is a great shame as, once these early difficulties are overcome, the game soon develops into an involving and addictive, albeit not too complicated, game of space exploration and empire building in the face of enemy action and natural disasters. This playing guide is put together in order to correct the deficiencies of the game manual and, I hope, allow more players to enjoy Millenium 2.2 to the full.

Top Menu Bar

The principal method of control in the game is the manipulation of the row of eleven icons which make up the top menu bar.

From left to right, the function of each icon is as follows :-

MOON BASE : clicking on this icon will take you immediately to the Moon Base control screen from wherever you happen to be in the game. Clicking the right mouse button at any time will also accomplish the same thing.

COLONIES : clicking on this icon will bring up a list of those planets where you have successfully managed to establish colonies. Click on the appropriate name in the list to be taken immediately to the control screen for that colony.

CRAFT ROSTER : click on this icon to access a list of all the spacecraft which you have managed to build. The name of each craft will be shown in one of three colours - red if it is in transit from one planet to another, green if it is stationary upon a planet, and yellow if it is stationary in space (in orbit awaiting landing instructions, for instance). As you pass the pointer over each name, a short message giving these details for each craft is displayed. Click on a name, and you are taken to the cockpit control screen for the craft selected.

DATABASE : contains detailed information on all the planets in the game. Unfortunately, you have to work on building up this information yourself by sending Probes to the planets you are interested in and then using the research facilities of Moon Base to analyse the data gathered by the Probes. Once research is completed, the information can be accessed by clicking on this icon to bring up a list of all the planets. Click on the name of the planet concerned and the relevant information is displayed.

BULLETIN BOARD : as the game progresses, various messages will be displayed on screen referring to your craft and their activities as well as other developments. Clicking on this icon allows you to examine a window containing the last half dozen or so messages that you've received.

FILE ACCESS : this facility allows you to save game positions to disk, and to reload previously saved positions from disk. Only four saved games are allowed, however.

LOG : this is basically your score for the game so far. It is called the Cilivilisation And Technology Rating (C.T.R.) and it is given as a percentage mark based upon the number of craft in service, the number of colonies established and the total population at your command.

ZOOM OUT : clicking on this icon will allow you to zoom out from a colony control screen to a view of the planet from space. Further clicking will take you to a view of the entire planetary system in which the colony is based, and from there to a view of the whole solar system if required.

ADVANCE HOUR : this is a "real time" game (i.e. one minute spent in front of the computer is equal to one minute elapsing in the game). Obviously, this could lead to long hours when nothing happens at all. Clicking on this icon will move the clock forward one hour at a time, allowing you to quickly bridge those quiet periods.

ADVANCE DAY : the same as the previous selection, except that the calendar is advanced one day at a time.

TIME AND DATE : a digital display of the current time and date. The game starts on 30 Jan 2200 at 10.00 hours. I finished approximately 20 years later (thank God for that ADVANCE DAY option), but quicker completions should be possible.

MOON BASE

The structure of Moon Base takes the form of six specialist modules located around, and connected to, a central hub which also doubles as the Flight Bay module. The facilities of each module are accessed by clicking on the picture of the relevant module as depicted on the Base control screen. It should be noted that the buttons representing each module (located at the bottom of the screen) serve merely as indicators as to the state of activities in the modules (red equals no activity, green is full steam ahead, and yellow means that the module is capable of activity but isn't presently doing anything). Clicking on these buttons has no effect whatsoever.

RESEARCH : everything starts from here. Nothing can be produced or exploited until it has been thoroughly researched first. The Research module is split into five areas which are shown as files across the screen. Click on the name of a file to access its contents.

(i) Colonisation : a list of the 38 planets and planetary satellites which comprise the Solar System. To commence research into a possible colony, you only need to click on the relevant name in the list. However, research will not progress unless a Probe has been successfully landed on the prospective colony site first. Once a colony research project has been complete, you will know whether a colony can be established upon the site and the type of materials that you will be able to acquire there. If the site is habitable, you will also now have the necessary information to build a SIOS colony ship which, when despatched to the target planet, will allow you to establish a base there.

(ii) Transportation : a list of the various spacecraft which are available to you. To start researching a particular ship, once again you only need to click on its name in the list. You start with the research into Probes already completed and, initially, may conduct further research into Grazers (medium size raw material transporters), Waveriders (small capacity raw material or equipment carriers which are very fast), Carracks (large but slow raw materials transporters) and SIOS (colony base establishment modules). Later on in the game you will acquire the means to research Fleet Carriers (large equipment transporters) and Juggernauts (terraformer transporters).

(iii) Weaponry : there are only two types of weapon available to defend yourself against enemy attack. Fighters are the easiest to produce, but are less effective in combat. Orbital Lasers are much more devastating in that they can destroy up to 10 enemy fighters at a stroke. However, they are much more difficult to produce since some of the essential materials will only be found on other planets and you'll need to find them and then establish successful colonies in order to extract them.

(iv) Energy : once again a simple list of the Solagens available to you. You start having already researched the Solagen Mk I and the Mk II is awaiting your attention. As the research into each grade of Solagen is comple-

ted, the next grade higher becomes available for research until all 10 grades are complete.

(v) Supplementary : the list here comprises the odds and ends which do not fit into any other category. Initially, you will be able to research into Life Support nodules which, when added to your other Life Support facilities, will allow your population to grow. You will also be able to construct a Bunker. The benefit of this asset is that any items placed within it remain impervious to enemy attack and therefore cannot be destroyed. Later in the game, other items will be added to the list and you will be given the opportunity to research into Vaccine to combat Martian Flu and into Terraformers to accelerate the reconstitution of the Earth.

ENERGY : this is where you store and install completed Solagen energy cells. There are ten types of Solagen (numbered Mk I to Mk X respectively). The higher the Solagen classification, the greater the level of power produced but, of course, the more raw materials required to create the Solagen in the first place. The Energy control screen gives you a list of all Solagens, together with the number of each presently held in stock. It also shows

details regarding the Solagen presently installed, the power level being output, and the rate of demand for power. Solagens are installed by simply clicking on the name of the unit required in the list presented. Provided there is at least one in stock, that Solagen will be automatically installed. Swapping between different types of Solagen can be done at any time, and it is useful to switch to low output models when faced with impending enemy attack since, if the attack is successful, the installed power source is usually the first casualty.

LIFE SUPPORT : up to six subsidiary nodules can be built and installed here. Each nodule provides sufficient accommodation to cater for 100 people. It therefore follows that the population of Moon Base will increase only when there is sufficient spare space to accommodate them. Build your nodules fairly early on in the game as some of the bigger spacecraft which you will develop later require large crews to man them.

PRODUCTION : this is where you will develop all the equipment that you need in the game in order to facilitate your interplanetary expansion. On the left hand side of the

---

RESOURCES

A successfully established colony will be able to produce various raw materials which can be shipped back to the Moon to be used in the production of new spacecraft and other equipment. However, each colony produces different materials and so it can sometimes be a little difficult finding the right items to be used in a particular task. Below is a list of all possible colonies together with details of their four primary outputs.

Colony				
Moon	Titanium	Silica	Aluminium	Iron
Leda	Methane	Silica	Iron	Sulphur
Enceladus	Silica	Aluminium	Iron	Hydrogen
Triton	Silica	Chromium	Titanium	Water
Hyperion	Sulphur	Aluminium	Copper	Uranium
Titania	Silica	Methane	Hydrogen	Sulphur
Miranda	Silica	Silver	Iron	Copper
Callisto	Silica	Iron	Titanium	Aluminium
Mars	Iron	Silica	Water	Oxygen
Tethys	Silica	Uranium	Aluminium	Copper
Rhea	Silica	Platinum	Nitrogen	Hydrogen
Titan	Nitrogen	Uranium	Platinum	Silver
Phoebe	Silica	Iron	Titanium	Nitrogen
Saturn	Hydrogen	Silica	Iron	Nitrogen
Uranus	Silica	Copper	Methane	Iron
Ariel	Silica	Aluminium	Nitrogen	Sulphur
Umbriel	Silica	Sulphur	Oxygen	Hydrogen
Oberon	Silica	Uranium	Water	Iron
Neptune	Aluminium	Platinum	Copper	Methane
Pluto	Silica	Methane	Platinum	Hydrogen

In order to carry out mining activities, a colony must be equipped with a suitable power source (typically a Solagen Mk III or above) and a sufficiently large population (50 bodies usually does the trick).

screen, there is a picture of a small, flickering monitor screen. Click on this picture and a list of all the items which you are presently capable of producing will be displayed. Items will only be added to this list when research into them has been 100% completed. Click on the item in the list which you wish to make and that will start the production process. The first stage of the process is the transfer of the necessary materials out of stock. Provided all the components are available in the required quantities, production will commence. It can take several days for even the most rudimentary goods to be completed, so do other things while you wait. A message will be given to you via the Bulletin Board once the process is done.

RESOURCE : this is your mining operation. There are buttons on the left side of the screen which, when clicked, commence and halt the processing. Once materials are extracted from the planet, they are automatically placed in store ready for you to use. There must be a suitable power source and sufficient population to support the mining operation. If these requirements slip below the minimum at any time, the Resource module will cease activities immediately and automatically.

DEFENCE : the Defence control screen features a central radar screen upon which are tracked the incoming hostile forces. This display will also tell you the number of enemy you face. Just to the left of the radar, there is a button for launching fighter spacecraft with a digital display below it showing the number of fighters available to you. To the right of the radar, there is a similar button and display for activating the Orbital Lasers and detailing the number of lasers currently available.

If a fighter is launched, the display switches to the orbital area of the Moon where, peering from your fighter cockpit, you spot the enemy heading towards you. Only one adversary is depicted at a time. Your task is to shoot down the quick moving opponent using the guns mounted on the front of your craft. Once the enemy has been destroyed, you will be returned to the Defence control screen where you will be free to re-launch your craft and take on the next enemy.

If an Orbital Laser is activated instead, there is a short pause as the weapon is initialised, and then a report as to the number of craft destroyed in the following explosion. Each Orbital Laser can only be used once as it too is wrecked in the operation.

The difficulty with combatting attacks is that they take place in real time and take less than a couple of minutes to be completed. It therefore becomes difficult to repel hostiles using only fighters when the numbers attacking are fairly large. There simply isn't enough time to carry out the task. You really do need a stock of Orbital Lasers in order to stand a realistic chance of survival. If an attack is not successfully beaten off, the energy source is usually destroyed (requiring immediate replacement or the base will not function effectively), as well as some of the population and some of the materials in store. As the game progresses, the attacks become more frequent and more widely spaced (if you have colonies, they too will be attacked). The damage resulting can therefore increase proportionately if you do not construct an effective defence strategy.

FLIGHT BAYS : the Flight Bays control screen shows a picture of eight separate bays arranged in a circular formation and

numbered 1 to 8 in a clockwise direction. On the left is a list of the bays with a note next to each number to indicate the type of craft presently housed in the bay, or whether the bay is actually vacant. In order to access a particular bay, you only need to click on its representation in the picture. This will take you inside the bay where, on the right, you will see a small picture of the craft contained therein, together with, on the left, a panel of details concerning the status of the ship (such as capacity, current payload and crew numbers). Below these panels there is a small row of icons which allow you to name the ship, assign a crew, load/unload raw materials, load/unload equipment, launch ship and scrap ship. All these icons are activated simply by clicking on them.

Once built, the Bunker will also be positioned on the Flight Bays screen. It shows up as a small blue panel in the lower left corner. Just click on this panel to access the Bunker.

The layout of any colony bases established will correspond to the descriptions above except that there are only four modules in place (Research and Production are excluded from colony bases).

Product:	MILLENIUM 2.2
Game Design And Programming:	Ian Bird
Published By:	Electric Dreams Software
Price:	Shop around as it should be available very cheaply.
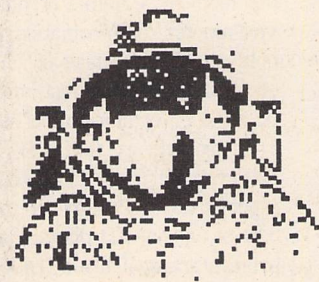
When you click on the name of a spacecraft in the Craft Roster list, you are automatically taken to the cockpit control screen. Here you will have access to a number of operating icons.

On the left hand side, there are icons which allow you to examine the contents of the cargo bay or, if you prefer, dump the contents of the cargo bay. In addition, on the Fleet Carrier, there is an icon which allows you to launch fighters.

On the right hand side there are buttons which allow you to select destination, set autopilot and land at destination. When you choose to select destination, you are given a

list of possible places which, at first glance, appears identical to all the other planet lists you will have seen in the game. However, there is one important difference. At the end of the list, an additional item has been included - the Asteroids. These are extremely important as this is the only place where you will find them mentioned. The Asteroids are also the only place which you can go to without having researched them with a Probe first (in fact, Probes are destroyed when they reach the Asteroids). The Asteroids will provide your first source of essential raw materials without which it will be impossible to make any progress in the game.

To select a destination, simply click on a name in the list. You will be given a short message telling you how long it will take your particular craft to arrive at that location. You are then asked to confirm your choice. Click to confirm and you are

Navigation

back in the cockpit. Click on the autopilot button to exit this control screen and leave the ship to make its way to wherever its going.

When it does eventually get there, return to the cockpit control screen and click on the icon to make the ship land. You will be given a short message saying how long the landing procedure will take (typically 45 minutes) and asked to confirm your choice. Do so and exit the screen again by pressing the autopilot button.

The ship will now go through its landing routine and you will then be able to access it again in the flight bays of the destination planet.

A full listing of Events in Millenium 2.2 will be available on next month's Disk Mag DMG.24.

DESKTOP DISCUSSIONS

Welcome to the start of this new regular column. Some of you may have read my Saved Desktop column in Floppyshop News, in which case many of the topics that will crop up here - hardware, applications software, PD, news analysis, and books - will be familiar.

Because of the change from bi-monthly to monthly, the format will be less fixed than with Saved Desktop. So, for example, not every column may feature a book review. Also, because of ST Applications readers' great interest in the serious side of computing and the excellent existing adventure column, there will be very little games coverage. Apart from that, just about anything connected with computing on the ST (and maybe beyond) is liable to be featured here in the months to come.

I welcome comment on the column so if you have any points, whether you disagree with me about something or you want a particular topic covered in a future column, then please write to me c/o ST Applications' usual editorial address.

Who?

For those of you who haven't read Saved Desktop, I had better introduce myself. My name is William Hern and I have been an ST owner for the past five and a half years. My first machine was one of the original 520 ST models with operating system loaded off disk, no television modulator, and no internal disk drive but at least the joystick ports were located in a sane and accessible place.

Buying the ST then was a calculated risk as at the time there were few pieces of software available with Logo and the appallingly bug-ridden Digital Research Basic the only common languages (a C compiler was only obtainable as part of the expensive Developers' Kit). Even such a basic commodity as blank disks were scarce and expensive - the first blank disks that I bought cost me a hefty £4.15 each, and they were single sided!

Indeed my first experience as an ST user was hardly encouraging. After putting plugs on the power cables, I turned the machine on, loaded up the operating system, and then the Basic interpreter. I then typed 'PRINT FRE(0)' to find out how much memory I had left to program in. To my horror, the machine gave the response of just over 5K! My new machine with half a megabyte of memory (which had seemed enormous) provided me with less memory to write in than my 16K Sinclair ZX81!

From there things could only improve and indeed they did. I quickly learnt how to free more memory for programming by turning off the screen buffer and removing desktop accessories. The upgrade to a ROM-based TOS the following summer provided even more memory. The software situation improved steadily and soon my fears of having bought a white elephant (the colour of the casing didn't help!) vanished.

Over the years I have upgraded bits and pieces of my ST configuration and my set-up now consists of a four megabyte STE, a grey-scale NEC Multisync GS monitor which allows me to use all three resolutions from one monitor, and an Epson printer for hard copy. My original 520 ST is not forgotten and continues to provide sterling service acting as a word processor for the rest of my family.

Some things, though, have changed little in the intervening five years. The version of TOS installed in my STE is little changed from the disk version sent to me in November '85. One interesting difference is that instead of bombs appearing on the screen after a systems crash, the disk version of TOS had Martians! And although it was a pain to have to load the operating system after every reset, the machine displayed a very elegant screen to prompt you to insert the operating system disk.

Next month this column begins in earnest and I will be looking at multi-tasking and assessing how practical it really is on the ST.

Rounding Off

I'm sure you're aware that CD-ROMs are one of the hot topics within the computer industry at the moment. Capable of holding vast amounts of information, they hold out the promise of on-line encyclopaedias and vast cinematic style entertainment software. The problem is that CD-ROM players are rather expensive, especially when compared to the cost of normal CD players, with prices starting at around £400.

With that financial barrier in mind, how would you like a *free* player? Yes, buy the Monotype Classic Typeface CD-ROM and you will receive a complimentary player. Unfortunately this CD costs £15,000 although Monotype do point out that it contains one thousand typefaces which would cost between £30,000 and £50,000 if bought separately.

I think I'll make do with the ST Club PD font collection for the time being....

William Hern

GFA PROBLEM PAGE

James Beswick's back with more solutions to your GFA blues...

How can I make TOS files with the GFA compiler?

When asked by the compiler for a name for the output file, instead of entering PRO-GRAM.PRG, enter PROGRAM.TOS. It's as simple as that! However, if you do choose to make TOS files instead of PRG files, remember this: TOS files run independently of GEM, so should you use any GEM commands in your program (i.e. alert boxes, menus, windows, etc.), then you'll crash your ST. However, the advantage of TOS files is that they can run in the AUTO folder without any problems if you own an STFM.

Why does the mouse just "die" after I've been reading input from the joystick, and how can I prevent this?

I've also noticed that the mouse pointer stead-fastly refuses to move once the STICK com-mand (or equivalent V2 routine) has been used. There seems to be a bug somewhere along the line, although I suspect the GFA routine is the problem.

To prevent this, just use this line at the start of your routine/program:

```
On Break Gosub Break
```

and then incorporate this routine at the end of your program:

```
Procedure Break
    Out 4,8        ! Enables mouse...
    Edit
Return
```

or just use OUT 4,8 while in Direct Mode.

How do I check to see if there are any extra drives attached?

An internal call is needed to do this: Bios(10). The line:

```
Drive$=Bin$(Bios(9))
```

returns a binary code which tells you which drives are attached. Each drive corresponds to one binary digit (bit) of the code.

```
GFEDCBA
0000001    Drive A: attached
0000011    Drive A: and B:
```

```
1010011    Drive A:, B:, E: and G:
1111111    Drives A: to G:
```

You could, therefore, make a short routine to check the attached drives:

```
Dr$=Bin$(Bios(9))
If Right$(Dr$,2)="11"
    Print "You have an external floppy..."
Else
    Print "You have just the one drive..."
Endif
If Dr$<>"0000011" or Dr$<>"0000001"
    Print "You have a hard drive..."
Else
    Print "You do not have a hard drive..."
Endif
```

What routine do I need to copy or move files?

In my opinion, the best way to copy chunks of data, however large or small, is by using BGET and BPUT. These commands read and write the data as a binary block and they are very fast. The routine I've devised to do this is as follows:

```
Fileselect "*.*","",F$
Open "I",#1,F$
Length=Lof(#1)
Dim A$(Length)
Bget #1,Arrptr(A$()),Length
Close #1

Fileselect "E:\*.*",F$,C$
Open "O",#1,C$
Bput #1,Arrptr(A$()),Length
Close #1
```

This will copy a file with a size as large as your ST's memory will allow. Of course, this routine can quite simply be adapted to move files instead of copying them...

How can I change the time or date stamp of a file without having to go into GEM techie bits?

GFA V3 owners are lucky enough to have the TOUCH command, where all you need to do is:

```
Open "I",#1,File$
Touch #1
Close #1
```

and the new time/date stamp will be set on the file. But I don't know how to do this with GFA V2, although I suspect GEMDOS function 87 has something to do with it! I'll see if I can put together a routine for V2 users for the next issue, but if any of you out there have already written this routine, send it in!

Is it possible to design your own non-GEM resources?

Yes, of course! Why use slow, unhelpful, GEM resources when you can design your own? There are many advantages in making your own. Firstly, you can use any resolution graphics - even animated sprites. You can use text in any size or font you wish, and you have complete control over it, so you could have a clock working in the corner of the screen while the resource is working. The major advantage, though, is that you can avoid all of the mile long program listings. I wrote the listing below for my old tutorial series in *ST Format*:

```
@Make_dialogue_box
@Maintain_box


Procedure Exit_box
    Cls
```

```
    Print At(1,1);"You selected option
               no.: ";Select
    End
Return

Procedure Make_dialogue_box
    @Frame(50,50,269,150)
    @Cen(62,"This is a demonstration")
    @Cen(72,"DIY resource box. It's so")
    @Cen(82,"much easier to build your")
    @Cen(92,"own! Select an option...")
    Box 70,100,153,122
    Box 165,100,247,122
    Box 116,130,202,140
    Box 115,129,203,141
    Box 114,128,204,142
    Text 77,114,"GFA Basic"
    Text 175,114,"ST Basic"
    @Cen(138,"Exit")
    Graphmode 3
    Plot 70,100
    Pbox 70,100,153,122
    Select=1
Return

' THIS ROUTINE DETECTS WHERE
' YOU'RE CLICKING THE MOUSE...
'
Procedure Maintain_box
    Do
        Mouse X,Y,B
        If X>70 And X<153 And Y>100 And
        Y<122 And B<>0 And Select=2
            Select=1
            @Highlight
        Endif
        If X>165 And X<247 And Y>100 And
        Y<122 And B<>0 And Select=1
            Select=2
            @Highlight
        Endif
        If X>114 And X<204 And Y>128
        And Y<142 And B<>0
            @Exit_box
        Endif
        If Inkey$=Chr$(13)
            @Exit_box
        Endif
    Loop
Return
'
' TIME SAVING ROUTINES...
'
Procedure Frame(X,Y,X2,Y2)
    Box X,Y,X2,Y2
    Box X+2,Y+2,X2-2,Y2-2
Return
Procedure Cen(Y,Text$)
    Length=Len(Text$)
    Length=Length*8
    Text 159-(Length/2),Y,Text$
Return
Procedure Highlight
    Pbox 70,100,153,122
    Pbox 165,100,247,122
    Plot 70,100
    Plot 165,100
Return
```

Please note: all comments were removed from the listing to save space.

This is a very simple DIY resource demon-stration, but if you experiment, you could make something quite original!

If you have any GFA queries, or if you any useful tips or routines, write to: James Beswick, GFA Problem Page, ST Applications, 49 Stoney Street, Nottingham NG1 1LX.

STICKS AND STONES

Atari are in for some harsh words this month, as Günter Minnerup nearly (but only nearly...) loses his temper over yet another cunning ploy by the Slough gang to stop professional users from encroaching on their games machine territory.

One golden rule of journalism, especially for an opinionated columnist such as this one, is never to write in red-hot anger. Always cool down and consider the implications (especially the libel laws) first: write in haste, repent at leisure, as they say. I admit I find that difficult this month. Having taken a few days to simmer down (even though the deadline for the column was drawing closer), I am still as angry as I was to begin with. So let me take a deep breath and explain as calmly as I can.

In the last instalment of this normally good-natured and judiciously balanced series of ruminations on the Atari scene, I made a reference to my search for some SLM 804 laser toner to illustrate a point about dealers. Well, a few weeks later I still hadn't found any, and after phoning just about every computer mail order business known in the UK, it gradually dawned upon me that the root of the problem might just lie at source. Yes, that company with the Fuji logo.

So I phoned Atari, to find out what the trouble was and what they were doing about it. A rather nice chap in customer relations cheerfully informed me that they had not had any stocks for three months or so, but that fresh supplies were now bobbing on the ocean waves somewhere between the Far East and the English Channel. It was breathtaking, I just could not believe it: there we have a company seeking to convince the rest of the world that it is a sensible idea to run a business on their computers and peripherals, which then cannot ensure a steady supply of essential consumables. Ever heard of stock control, Bob Gleadow? And what does a serious, well-run company concerned about its reputation do if, through some unforeseeable and unavoidable disaster - factories exploding, ships sinking, general strikes (hmmm, for three months?) - it really does run out of something essential? Not wait for the next banana boat from Asia, for sure, but instruct the world's favourite airline, or even Philippine Airways, to fly some over pronto, I guess. Expensive but good business nonetheless because it maintains a reputation for dependability. These little toner cartons aren't mainframes, after all.

When I had recovered my composure, I tried another avenue. I emphasised that a very urgent job was waiting to be printed out, and that I would therefore consider using someone else's toner to help me through the emergency. I said that I had a fairly good idea what type and make of engine Atari had used in the SLM804, but would they be so kind to confirm the information so that I could go hunting for compatible third-party toner cartridges? In Germany, such cartridges, marked clearly "for the Atari SLM804" and manufactured by the ultra-reputable stationery supply giant Pelikan, are freely available. The friendly voice could not find anybody from Technical Support and promised that I would be phoned back.

No, don't giggle in the back row over there: he did phone back, and fairly promptly to - but only to inform me that the technical people at Atari refused to talk to me, let alone divulge technical information about their laser printer, if it was to enable me to use another company's products. I was speechless, mumbled a few polite phrases and hung up.

For years now, often against the odds and the ridicule of Mac and PC owners, some of us have been vigorously defending the ST's capabilities as a serious machine. Over and over again, we have made excuses for Atari UK: they can't be blamed for the peculiar tastes of the British punters, if they can sell 520ST games packs to make a fast buck then maybe that will in the long term benefit the serious user, and so on. I am now reluctantly coming to the conclusion that our Atari really do not care about their reputation in the serious market. Having carelessly allowed themselves to get into a position where they have to leave their distributors and customers in the lurch for weeks and months, they are now effectively telling them to get stuffed if these customers are looking for alternative supplies of something Atari themselves cannot, by their own admission, deliver. Atari were effectively telling me (or rather, refusing to tell me): "Come on, silly boy, one of these days a ship will come, and until then we want you to stop printing."

Can you imagine Hewlett Packard doing that? Well, the question does not, of course, arise because everybody knows that their lasers are based on the Canon engine and an entire gaggle of manufacturers are jostling to supply toner for it. So can you imagine Atari Germany allowing themselves to run out of toner supplies for their plush DTP Centres, then telling them to suspend activities until Atari give the signal?

I am in danger of breaking the first law of journalism again. So before I do something silly like dumping my Mega ST and SLM804 on the doorsteps of Atari House, on the way to the nearest AppleCentre, let me wheel out my premeditated, calculated response which I reckon has a much better chance of getting through to Atari UK than any number of complaints. It also has the merit of actually being helpful to current and future fellow sufferers, and saving all of us some money in the bargain.

The engine inside an SLM 804 laser (although not the newer, SLM 605) is known as a TEC-LB 1301. These are pretty rare in the UK outside the Atari scene (other models using them are manufactured by Oasis, Memorex, and Kaypro, none of them big players in the British laser printer market), but third party toner cartridges for that engine, some of them explicitly labelled for SLM804 use, are certainly obtainable, at prices sometimes well below Atari's. I have tracked down a number of suppliers, who are sending me samples which I will, over the next few weeks, thoroughly test for their reliability on the Atari laser. If these trials produce satisfactory results, I shall, probably in next month's column, publicise dealer's phone numbers and prices, as well as warn these dealers to have enough stocks to meet a sudden rush from disgruntled Atari users.

Atari won't like that, I know. But they have had their chance, and anyway monopolies are never in the best interests of the consumer -especially not when they fail to deliver. Last month, I wrote of the conflict between the market and feudalism in the ST scene. Feudalism? Even medieval landlords understood it as their god-given duty to look after their peasant serfs. Since no such considerations seem to be entertained in Lord Gleadow's castle, let market forces speak.

Günter Minnerup
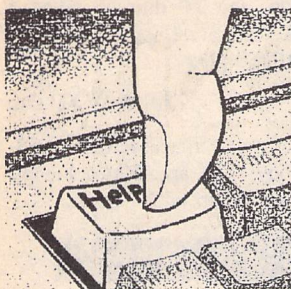
FORUM

The Forum pages are a regular feature of ST Applications, enabling readers to exchange ideas and help each other out with problems. Whilst we attempt to briefly answer questions here, if you have additional information or ideas please do submit them for publication. What you consider to be trivial information can often be of considerable use to other readers!

Please send your letters on disk if possible. Disks will be returned with a PD of the writer's choice. Longer submissions may appear as articles, in which case you will receive payment at our standard page-rate.

You can now post messages for inclusion in the Forum via the CIX bulletin board on 081-390-1244. All messages posted onto our **stapplications** conference on CIX are considered to be for publication. Private mail can be sent to us with **mail to paglo**, but do not expect an instant reply! Messages reprinted in the magazine Forum pages are identified by the CIX stapplications conference message number after the author's name.

CIX is a commercial system with a £15 joining fee and on-line charges of between £2 and £3.10 per hour. For more details see the introduction to CIX in issue 3 of ST Applications.

Key:

The following codes are used for each Forum entry:

J Pringle - Forum 29: Author who first raised the subject, and in which issue. In this case 29 refers to the Forum pages in Issue 29 of The ST Club Newsletter.

Ⓠ Question

Ⓐ Answer

Ⓘ General information or 'Input', advice, discussion, hints and tips, etc., with or without reference to previous Forum pieces.

● Editorial reply

Musicians Matter

Ⓘ ST Applications issue 5 included an article on the ICD AdSpeed upgrade and, again, compatibility with major music software is ignored. "Programs which depend on precise timing are liable to cause problems with AdSpeed... at 16Mhz" so the reviewer writes, but there is no mention of compatibility with C-LAB's Notator, Steinberg's Cubase or any other sequencer. What other programs are more timing-critical than these? Bluntly, will AdSpeed do anything for a Mega 1 running Notator?

I thought that ST World was the only magazine on the market for serious ST users, so it's a pleasant surprise to discover your magazine. However, please don't forget that there are a whole army of musicians using serious programs like Notator and Cubase which cost as much as the system itself - and yet the compatibility of new hardware and software products with such programs is never mentioned. DTP is not the only serious use to which the ST is put.

Your enthusiasm for the ST deserves a medal, if not a pension! I don't want to be forced, by the proverbial market forces, into abandoning Atari and buying a Mac in order to be guaranteed the longevity of 'arm-and-a-leg' music software and its continued development. It is the serious forum for 'things Atari' that will help ensure a brighter future (in sharp contrast to its chaotic past), and ST Applications is such a forum. End of gospel according to grumpy musician.

Martin Norfolk

● Point taken on the need to accommodate all users' requirements in reviews. But with limited in-house resources we need to make some compromises, otherwise we'd never get reviews into print. In the case of hardware add-ons like AdSpeed, there are so many potential conflicts with software that it is surely the task of the UK importer (Silica Systems) to keep abreast of incompatibility problems and inform potential customers. On the other hand, we do offer the Forum pages for users to offer their second opinions and bug reports on software that has been reviewed.

Fast Fire

Ⓘ In your FastFire project on page 20, STA 5, I would advise putting a diode (preferably a high voltage one) in reverse polarity across the coil of the relay. This is to prevent the Back EMF (high voltage of reverse polarity) from damaging the transistor.

Rob Wardle

Software Documentation

Bill Hadden - STA 5 Page 31

Ⓘ Whilst agreeing with Bill Hadden's comments regarding software documentation, I believe he omitted one relevant observation. Having been involved, over many years, with both the design and documentation of industrial electronic equipment, I am of the opinion that the worst person to write an instruction manual (or software instructions) is that person who has intimate knowledge of the software. In industry the usual technique is for the designer of a piece of equipment to be saddled with the production of a draft instruction manual which will eventually be 'knocked into shape' by a technical author before printing. This action sows the seeds that often results in an inferior crop.

It is often a fact that the designer is good at his work but poor at writing in a lucid style. He invariably knows the design intimately but fails to accept that that which is obvious to him might well be a mystery to someone else. The original Atari 520 genre instruction book was a good example of muddled thinking. The problem is exacerbated by the fact that many technical authors are not truly technical in the real sense of the word, but rather have an expertise in producing a technical document from information provided by a real technical expert. Here lies the first difficulty; the technical author only knows what he has been told, or presented with, by the acknowledged expert and would not be expected to know whether he has received all relevant details. On the basis of that information the instruction manual is produced in draft form and may or may not be be passed to the 'expert' for vetting before printing.

Let me emphasise that I am not deprecating the efforts of technical authors who should only be expected to produce readable manuals based on information made available. In most instances poor manuals should be placed not at the door of the technical author or expert, but at the higher echelons of the organisation for allowing it to happen. Bill Hadden refers to the peculiar English presented in many foreign manuals and I concur, but I often wonder how foreign language manuals produced by English persons are considered; no doubt with much hilarity. Bill Hadden's suggestion that foreign translations into English should also include the original foreign text is sensible, but I wonder how many English persons could make any sense of the non-English product. In most cases broken English will be better than no English. I have a very reasonable ability to read French and German but give me the foreign English every time. Bill Hadden stated his thoughts and I endorse them but we must remember that the English language is, probably, one of the most expressive languages in the world - and so it should be since we have purloined many words and phrases from other languages. We can't even agree on the spelling of some words e.g. disk or disc. The Americans use 'color', 'program' and 'randomise'(often not found in an 'English' dictionary).

Finally, whilst I admire Bill Hadden's offer to give assistance to software instruction writers, I fear that he might put himself in the position of many technical authors in that he will only be able to work with the information that he is presented with, warts an' all. Congratulations to him for a well presented article.

R L Tufft

Craft

I May I endorse Steve Jones's recommendation of Craft (ST Applications 5)? I have become completely addicted since I started using it six months ago. In fact, I now use it as a more or less permanent replacement for the GEM desktop - it's a lot easier finding files on a hard disk if you can type 'ls e:\lc\headers' to get a directory instead of having to click one's way through icons and windows.

Unfortunately, there is a problem which can occur when running standard GEM programs. Programs which install an alternative desktop (First Word, etc.) rely on the desktop to perform certain clean-up operations; if these are not carried out, subsequent GEM programs will normally crash. I have written a small program called 'setdesk' which does the necessary clean-up if it is run after an offending GEM program. (If you have problems with a GEM program which you use frequently you can write a script file which calls setdesk automatically.) If anyone wants a copy, I have sent it to the ST Club. (It also works with other shells such as the Mark Williams shell.) I wrote to Commedia suggesting they incorporate the clean-up code directly into the Craft shell, but I never received an answer.

Jeremy Hughes

● Jeremy's setdesk program will available on next month's Disk Mag (DMG.24); or send a disk and return postage for a copy.

DeskJet Matters

Keith Baines - Forum STA1
Andrew Barclay - Forum STA3
David Alwyn Thomas - Forum STA5
H H Patterson - Forum STA5
Will Mowat - Forum STA6
John G Frazier - Forum STA6

I There is one quick and cheap method to get your hands on a GDOS driver if you are a Hewlett Packard DeskJet owner. The UK distributor of the wonderful word processor Calligrapher will supply a DeskJet driver to anyone who asks for it, along with a demo of Calligrapher and a brochure. How much do they charge for this? NOTHING! That's right, you heard correctly, zero, sweet FA, not a sausage. The present version of the driver has a minor buglet which may cause some problems, but there is a new one on the way. Just give Working Title a ring on 0865-883592 or fax them on 0865-883233.

Anon

● Working Title can also supply a Cannon Bubblejet GDOS driver.

I Basically, all printers and computers communicate in the same manner, so why do some DeskJets need to be on-line before the computer is switched on? I haven't got a DeskJet, yet, but as I run a large Ram Disk and never switch off my STE, I would find such a necessity irksome.

H.H. Paterson's comments on the subject in STA 5 prompted some thoughts. Could the problem be the result of too many earth connections? Don't laugh! This is a well known problem with Hi-Fi set-ups. A couple of years ago, the problem also reared its ugly head in an audio visual set-up with which I was involved. When everything - two projectors, control box, cassette recorder, amplifier and speakers - were connected, a fuse kept blowing in a projector. The projectors, control box and recorder were checked and re-checked without success. It was over a year before someone suggested we disconnect the earth lead in the amplifier mains plug, and - bingo - no more blown fuses. Not terribly logical, I know, but one never knows with these modern machines.

David J Lindsay

A new can of worms?

Derryck Croker - Forum STA4
John Higham - Forum STA4
David Smith - Forum STA4
Les Bessant - Forum STA6
Jeremy Hughes - Forum STA6

I I remember reading somewhere that in the UK the correct spelling is floppy disc. IBM

use disk (short for diskette), but over here ICL use disc. Shouldn't the 3½" disc be called a 'stiffy disc'? - 5¼" discs are 'floppy', but aren't 3½" discs just a little tougher?

John Watkins

● According to major manufacturers such as KAO and Sony they are 'Micro Floppy Disks', and they are 90mm, not 3½" wide...

Could Do Better?

Tony Smythe - Forum STA6

I What is one to make of a company - GST Software Products Ltd. - who write on April 12th thanking you for returning a product registration card, telling you that your free support started on 15/10/90 and ended on 14/11/90, when, in fact, you have never bought a GST product. They then go on to offer further support for the 'very reasonable fee of £25 per year'. Oh, they tart the offer up a bit with the promise of newsletters, a bulletin board service and discounts on other products. But as I believe that good applications are those supported FREE for EVER, it looks a very shoddy deal.

I have one program now distributed by GST - Neodesk. Fortunately for me, however, as I have no intention of supporting any company operating in this manner, my copy came direct from Gribnif in the USA. The cost of upgrading to NeoDesk 3 was less than the GST 'discounted' price, and I get newsletters from Gribnif.

David J Lindsay

STOS

Q Is anyone else having difficulty getting the disc error messages in STOS to work correctly? There are specific error numbers which are supposed to be returned for each disc error, such as Write Protected, Disc Full, etc. But in all cases my STOS returns the error number 52, "general disc error". I have noticed that even the editor/interpreter is also only able to produce either "OK" or "Disc Error" in response to a disc operation. Has anyone overcome this, is there a patch/fix available for it, or is it fixed in versions of STOS later than version 2.5?

My letter to Mandarin resulted in an invitation to join the STOS CLUB (for a fee), but no hard information, or acknowledgement of the problem.

Graham Galbraith

● With the rampant discounting that is now accepted practice in the software 'industry', there is a school of thought that says that it is not possible for software publishers to cost support into the price of the product and still remain competitive. A few retailers take a similar approach: if they make £5 selling a £99 package at £60, can you realistically expect them to offer support as well? Günter Minnerup commented well on this aspect of the

ST market in his STicks and STones column in issue 6.

Whether it is ethical to charge extra for support is highly questionable. Ideally, with perfect software and documentation, there would be no need for support. If the product isn't perfect then surely it is the manufacturer's responsibility to make it good, or refund the purchase price? Or is the software industry a law unto itself?

Missing Drive c

CL Jones - Forum STA5

A The cartridge icon is not required in order to start Fast BASIC if the Fastart.prg program is used. The Readme.1st file on the demonstration diskette supplied with the cartridge contains the following explanation:

"Due to a bug in the old operating system, the cartridge fails to start up when some hard disc drivers are present (including Atari's Ahdi.prg). The solution is to use the Fastart.prg utility which can be found in the Toolbox directory of this disc. This program starts up the Fast Basic cartridge no matter what hard disc drivers are installed."

I created a directory for Fast Basic on the hard disc and copied Fastart.prg into it. Though I need to perform more mouse operations in order to start Fast Basic, it does run successfully.

Out of curiosity, I tried the solution suggested in Forum (STA5) but found that my system hung if I double-clicked on the cartridge icon.

David Hardy

Minority Interest Group

David Martin - STA 5

I I doubt if David Martin realises just how soon UK serious users will be marginalised. The recently announced prices for the Mega STE and TT ranges would indicate that that un-happy state will be reached by the end of 1991. So far as spreadsheets and databases are concerned, we are already on the outer fringe. Atari UK, as usual, appear oblivious to what is going on in the real world outside Atari House. Apart from the Mac LC mentioned by Mr. Martin, the Amiga with an A5000 accelerator or the PC world with Windows 3 beckon strongly.

To take the last as an example: complete 386 systems are available now for under £1500 (special offers as low as £900) and a 486 set-up can be had for less than £2000. Further, with Intel loosing their stranglehold on the manufacture of 386 and 486 chips, it is not too difficult to see at least £500 coming off the above prices by the end of this year. Even at the bottom end, the pricing of the Mega STE must be sending hundreds scurrying to the nearest Apple dealer for a Classic.

A machine that is over two years late, the TT,

cannot be priced in historical terms: it must be priced for the prevailing market. That said, the TT price is unsustainable. A cut of around 50%, now, would be about right, giving it a chance of catching a market share. By the autumn, most of the potential buyers will have gone else where. Given Atari UK's propensity for contemplating its own navel, I reckon we either learn German or hope that Atari Germany makes a successful take over bid.

David J Lindsay

● To be fair to Atari UK, they have recently embarked on a marketing campaign to reposition the ST as a general purpose entertainment and applications machine. The recent double page ads are just the start of this campaign, there are a number of new initiatives that will be launched between now and the end of the year. This may be five years late, but at least it is happening and Atari finally have their heart in the task at hand.

There is no doubt that the TT is overpriced in the UK, but until the ST is accepted as a mainstream applications machine Atari UK can have few hopes of selling many of them. Hence the price. The TT is very much a premium-priced product for established ST users; there is little point in entering into a head-on clash with top-end Mac and PC hardware when professional quality ST software is so thin on the ground. With UNIX the TT will run a vast array of professional business and technical software, and then a price cut would be in everyone's interest.

Q I have recently been considering selling my Mega 1 and upgrading to one of the new Mega STE series of computers. But a problem has arisen: nobody seems to know the correct specifications of the Mega STE 1. For example, ST Format says that the Mega STE 1 has 2MBytes of RAM, a monochrome monitor, but no hard drive for around £690; while on the other hand Computer Shopper says that it has 1MByte and a hi-res monitor. And the ST Club seems to be just as confused as I am. In the news pages you say that 'The basic Mega STE will come with a 16MHz 68000, 2 Mb of RAM expandable...' and on the next page it says 'The Mega STE's come complete with a high-res monitor at £599 ex VAT for the 1MB model...'. Can you please tell me which is the correct spec?

Rob Wardle

● Contrary to the logic of the old model numbering system, the Mega STE1 will have two megabytes of memory.

FSMGDOS

John Watkins - STA 4

I I think that you got slightly the wrong end of the stick with respect to my Forum point about FSMGDOS. I had envisaged that FSMGDOS would continue to use bit-mapped fonts at small point sizes, especially with the screen fonts as they use up very little memory

and disc space - i.e., point sizes of 6, 8, 10 and 12 would still be bit-mapped for detail (look at the mess Calamus makes of small point sizes, especially on dot-matrix printers). With a 2Mb STE and only two floppies I only have problems with the sizes of fonts on disc (especially at 360dpi). In use, FSMGDOS would have a table of the bit-mapped fonts, and then when a 'vst_point' call is made the relevant font would be generated if needed (and cycled round a font buffer). Given the speed of most printers the extra time taken to generate the fonts for printing won't be too intrusive, and if memory was tight the large size fonts could be deleted from memory as soon as they have been used.

Further on GDOS: when I tried to get the official Atari LQ GDOS driver from SDL (as Silica shop technical department), I was told that "Atari ... have not released an LQ standard GDOS driver". I have written back expressing my disbelief. Does this mean that purchasers of Atari's HyperPaint and HyperDraw are officially denied output on printers other than by using the Epson FX80 driver and the Atari Laser? Surely the whole point of a graphical interface like GEM is that it is 'device independent'? The success of Windows on PC's I think is partly due to the availability of device drivers enabling output at the highest quality available (be it to screen or printer).

John Watkins

● Atari do have an LQ (180-dpi) driver in the guise of their Star NB15 GDOS driver. But there is no recognised supply channel for additional drivers from Atari. As we have a GDOS license we can supply any of the Atari drivers (SMM804, FX80, NB15 and SLM804) to registered users of Fontkit at £2.80 each.

Signum Tips

I I see you are going to run a series of articles on Signum! My own tip is to help with the drawing of tables and grids.

Copy the top and bottom horizontal and left and right vertical lines from the graphic font included with Signum to four blank keys on the font you commonly use. (I use the shift/brackets, the shift/slash and the shift/asterisks on the numeric keypad.) With each of these keys create a macro to produce a line of three or four strokes joined together. It is a bit fiddly and care must be taken to ensure that the cursor ends at a point where the next line can join the previous one properly. Once this is done, it is a 'simple' matter to construct lines around your tables. Turn the text attribute off, position the cursor where you want the line to start and press the appropriate macro key as many times as necessary to obtain the line length required. I find it better to join several short lines than to create one long one, as it makes the macros more versatile.

Some people recommend cutting lines out from a section of the hardcopy screen to put around tables. I prefer the macro method, as

cutting out hardcopy sections involves a certain amount of trial and error every time that you do it - my first (second?, third?) attempt is always too short or too long. However, I have used the hardcopy routine to put borders around text - fiddly, but produces very good looking certificates.

John Ridge

I've just bought SDOGraph and Convert from GateSeven and they transform image handling. I can now print landscape in Signum and can import high-resolution images automatically without having to piece together many separate tiles. On occasion in the past, I've fitted together 35 individual tiles by hand to make a full-page, highly detailed graph; yesterday the computer did it on its own direct from a huge image scanned at 400 dpi onto the Signum page in a few seconds!

Dr J M Bowsher

ST Writer

After having sold the AtariWriter cartridge for my 130XE, I had to transfer a file produced by it over to the ST for further work.

You might know already that ST Writer is very closely based on this old program, so much so that it is possible to load AtariWriter documents directly. We are offered two means of carrying this out, either from Atari-Writer direct or from a disk file already present on one of the ST's drives. The first method requires the 850 interface, the handler for which should be loaded when AtariWriter is booted. The file is then "saved" to device R:, which is default port number one. With a null modem cable connecting this port to the ST and with ST Writer waiting, the file should transfer OK. I (of course) had sold the cartridge, and so an alternative had to be sought.

My first thought was to use a PD terminal program on the 8 bit (Amodem7), and send the file directly to ST Writer as if I were uploading a text file to a bulletin board. This worked fine, except that ST Writer seemed to think that transmission was finished when the 8 bit's buffer emptied and wouldn't accept the next installment - resulting in a truncated file.

The second attempt worked just fine by using Xmodem protocol to send the file from the 8 bit to a disk file on the ST using terminal programs on both machines. Set both programs to Atari 8 bit terminal emulation or you will lose formatting information. Once the file has been ported across it can be directly loaded complete into ST Writer.

Straight Ascii files can be produced very easily from this file. Print it to a disk file (this will remove all print formatting), reload it and perform a search and replace operation to change paragraph markers into a character that isn't used in the file, perhaps the ~ character. My paragraphs are blocked left, and so paragraph markers are two carriage returns.

Having preserved the paragraphs, search and replace all carriage returns for a single space. Replace the paragraphs by searching for the character used as a marker, in this case the ~, and replace with two carriage returns.

Page 6 Publishing (0785 213928) sell a lead and program called TariTalk at £19.95 that will allow files to be ported across without the aid of the 850 interface. I have not tried it, but I can see no reason why it should not be successful. Either way, using ST Writer saved me a great deal of retyping, some of it a lengthy hex data listing for a magazine.

Derryck Croker

DTP User Groups

I am at the present time publicising a new user group that I am setting up for all the users of DTP programmes on the ST. I had originally intended to run the group just for Calamus users, but where does that leave the Page-Stream or Timeworks user? So I hope I shall be able to offer a user group that covers all of these, even some word processors that masquerade as DTP programmes such as Calligrapher.

I would be grateful if you would find room in ST Applications for the details of the User Group. I hope to be putting out the first of the group's newsletters by this summer and on a regular basis from then on.

Dave Howell.
Flat 3,
68 Corporation Street West,
Walsall WS1 3QR

Does anyone know of a Calamus User Group? If not, would anyone be interested in forming one, or simply setting up an informal newsletter for swapping tips, pooling information, letting off steam about bugs etc?

Mike Gerrard
5 Parsonage St
Wistow
Huntingdon PE17 2QD

Undump

Is there an ST equivalent of the Unix program Undump? Some Unix programs take advantage of the abort() procedure call, which dumps an image of the calling process as a file called core. Frequently this is a nuisance and in program development it's often worth defining a shell script (rm *.o core ...) that removes this file along with other junk. Sometimes, however, this file can be useful. Some Unix programs that allow extensive pre-configuration, such as TeX and EMACS, can be made to call abort() so that a core file is dumped after the configuration files have be read and incorporated into the process. This core file can be resurrected by undump to give you an executable that starts up ready configured, thus

saving the sometimes lengthy pre-configuration time. I don't think there is an abort() function in TOS (or at least in my old version not an intentional one!) and so a direct equivalent of undump seems unlikley. However, other approaches are available, possibly implementing the function as a desk accessory.

Dick Perkins

Monitor Matters

Harry Ridley - STA1

Connecting an ST to a television through the SCART connector gives quite a good picture if the TV has European RGB signal levels, and if you can persuade it to accept the RGB instead of the video signal.

Some TVs automatically take the RGB signal, if it is available, but most need to have pin 8 of the SCART connector raised to a couple of volts in order to select the RGB signal. At least, on my really old ST, there was a pin (I am not sure which) out from the ST which was not connected on the SCART side that supplied the voltage so that all I had to do was to connect the loose wire in the SCART cable to pin 8.

If you have a TV with US or Japanese signal levels you get an almost unbearably intense picture. I remember seeing somewhere (probably in your newsletter or ST World) details on how to adapt the signal levels with the help of some resistors. Is there anyone who remembers the details?

Karl Forsberg

Editing Resources

Does anyone know how to access the resource file of Superbase P2? The alert boxes with wrong defaults are driving me up the wall. Why must nearly all program writers treat us like children, wimps, or imbeciles?

David J Lindsay

● As Superbase doesn't use standard GEM dialogs it will not be a trivial matter to edit the Resources. You could break your licence agreement with Precision Software and edit the text in the Superbase files with a disk editor.

DIY Scanner

Philip Bead - STA1

I have built the scanner on disk UTD*51. The parts are all available from Maplin's, and the overall cost was about £20. The actual construction is not difficult if one can use a soldering iron, but I would recommend the use of IC sockets. The scanning head fits to the printer head of a dot matrix printer. However, I have not yet managed to get the software supplied to drive my Star LC24-10 printer - any advice would be appreciated.

Robin Burr

Banners?

Q Does anyone know of a really good Banner program, either commercial or public domain? I've tried DM Banner which is certainly very good, but is there a program that perhaps uses outline fonts and imports graphics?

Also, do you know of anyone who supplies Banner paper, i.e. a roll of paper with sprocket holes and micro-perfs down the sides, but not across the paper?

Ian Sheppard

DC Format

Q I have been having a slight problem with DC Format lately. If I run the program (or programme if you insist!) from the internal drive A and format disks in drive B, on exiting the drive A window displays garbage for a moment, then the machine crashes. If I format the disks in the A: drive, there is no problem. Does anyone know why this might be happening?

Les Bessant

Engineering Software

Q I am a structural engineer and would be interested to know if there are any programs available in this field. I am hoping to write some stuff myself, but being a novice this will obviously take some time. If there is anything available, or if any one else interested, I would be grateful if you could let me know.

Paul Boardman

● There are no packages that I know of that are specific to Structural Engineering. Has anyone any suggestions?

FSelect

I I hardly dare include this because it is so trivial. I have been using Fselect.Prg for some time and only recently found that several files can be selected at once by a click-and-drag technique. The initial click must start well to the left alongside the first file to be selected. If your initial click is near the files, an individual file is selected. For months I tried to position the mouse pointer alongside and just between two filenames before I realized the futility of this.

Barrie Stott

Mouse Button Repair

I Paul Rossiter advises the swapping of mouse buttons when the left one inevitably gives up the ghost. I have just replaced both buttons with microswitches (Tandy cat. 275-016), which are epoxy resin'd into the spaces vacated by the old switches after soldering the NO contacts to the appropriate pads on the mouse's PCB. Check carefully for short circuits before the epoxy dries hard - I was just able to unstick mine! You will also need to cut the pegs down on the button actuating pads: do this carefully in stages, checking each time.

This is a worthwhile repair since it promises a longer term answer, but you will have to get used to a much lighter button action. Alternatively, replacement "popper" switches are available for about 30p each if you want to conserve the mouse in its original condition.

Derryck Croker

vst_load_fonts with Atari SLM804

I A program I am writing entered vst_load_fonts (in the VDI) but never came out. After a long time spent in rewriting the program, changing bindings to VDI, disassembling GDOS etc., I remembered that a couple of years ago I changed my fonts from the distributed 8086 variety to 68000 for use in Fleet Street Publisher. Re-establishing original fonts solved the problem! I suppose really that this is a problem with GDOS rather than the printer.

Barrie Stott

New Old Sound Chip

Q Does anyone know what happened to the sound chip that was originally meant to go into the ST? I remember it as having a specification of 16 channels, stereo, sample playing and synthesis akin to FM as used by Yamaha, etc. There were apparently demos that Atari had that were of various instruments and impossible to tell from the real thing.

It has been 'in the pipeline' since 1985. The last I heard was a year ago when Jack Tramiel said it was in the hands of a third party tester/evaluator and was nearly ready.

Iain Laskey

Micro Emacs

Q I have modified Micro Emacs to enable it to use a mouse. I have no problem at all when using a non-blinking cursor. However, when the mouse moves over a blinking cursor, strange things happen to its appearance (the cursor, not the mouse). Any suggestions as to how I can retain the solid black flashing rectangle would be welcome since at present I believe it is impossible. [Micro Emacs proper uses only VT52 facilities; the extension opens a virtual workstation, gets a handle for the screen but opens no windows (i.e. it uses VDI but not really any AES services).]

Barrie Stott

French ASCII

Q My college is a subscriber to Campus 2000 and we use the mailbox facility to communicate with colleges in other countries. This is less than satisfactory when communicating with France as there appears to be no simple method of including accented characters.

I suspect that in France they use a modified ASCII code so that these characters can be transmitted via modem in 7 bits. I would be most grateful if a 'comms expert' could provide a copy of the code used so that I could write conversion programs to change ST ASCII text files into a form suitable for transmission to France.

A Goodhew

Timew-orks Hyp-hens

I The hyphenation paradigms of Timeworks DTP occasionally split a word in the oddest place: howe-ver, whene-ver, PageS-tream, etc. Hitherto, I've had to keep a sharp eye open for such oddities and change them manually using CTRL-.

However, it is possible to alter and/or add to the paradigms. In the programme folder "PUBLISH" there is a file called "Publish.Hyp", an Ascii file that may be loaded into your word processor and amended. It contains over 900 words, each on a line unto itself, showing where any break should be made by the insertion of a hyphen. Long words may be given more than one possible break:

'in-doc-trin-ation'.

For safety's sake, make a copy of the original file, and then load it into your WP and add any new items that mis-behave in Timeworks:

hot-house
how-ever
hurt-ful
etc.

Make sure you re-save the file as Ascii with end-of-line carriage returns, and with the same name as the original.

I've tried this with just one or two examples that commonly give silly breaks, and it works.

David Smith
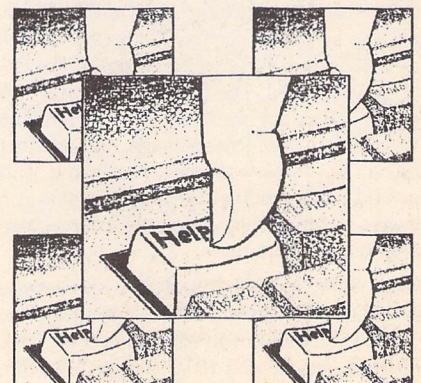
Programmers' Forum

Starting this month, ST Applications' regular programming column tackles the complex subject of GEM metafiles.

Introduction

The GEM metafile is potentially one of the most powerful aspects of the GEM system. Theoretically, it allows the free transport of vector art files between GEM applications. In practice though, it is not quite so easy. Over the next few editions of Programmers' Forum, we will investigate the file format and differences in its interpretation, and we shall take a look at some software to make metafile handling easier.

Before we dive off into file formats, perhaps a gentle introduction to metafiles is in order. There are two file formats associated with GEM graphics files: the image or .IMG file, and the metafile or .GEM file. IMG files are produced by scanners and some painting programs, which need to represent bit-image data reasonably efficiently. In basic terms the file consists of a header containing data which can be used to calculate the size and resolution of the image (dots per inch) and a compressed representation of the image.

GEM files are usually associated with applications which use GDOS. These include object-oriented drawing packages such as EasyDraw, and also programs such as K-Spread 4 which use metafiles to export their output (in the latter case, graphs). The file again consists of a header and a data block, but this time the data does not actually form an image, but is a list of instructions for *how to make* the image. This method has the advantage that the data can always be represented using the full precision of the output resolution.

Many DTP packages and word-processors have the facility to import one or both of these formats, thus allowing the inclusion of artwork in documents. If you have such a program, you will probably have seen the effects of

attempting to scale up an IMG file: jagged lines and distorted shapes. Scaling GEM files should produce few, if any, of these effects; although text can present a problem. If you need convincing of the difference between image and metafile data, take a look at Figure 1. The same picture was saved as both a .IMG file and a .GEM file. Both files were then re-scaled to a new size and displayed on the screen, which was then saved as a screen dump. The difference between the pictures is perhaps most marked in the filling of the circle. The metafile contained the instruction to produce a circle and then to fill it. Re-scaling simply altered the area to be filled, it did not affect the fill pattern. By contrast, the fill pattern in the IMG file has been badly degraded by the rescaling: the pattern of pixels produced by filling at the original resolution has itself been scaled, with unpleasant results.

The metafile instructions are interpreted by a GDOS device driver in a fashion appropriate for its output medium. The device drivers for the ST screen are built into the VDI code in the ROM. Devices such as printers must be supported by external software, like FX80.SYS.

Unfortunately, although the fundamental structure of the GEM file has been specified, different programs have interpreted the 'grey areas' in different ways. This can result in difficulties in moving data between programs, even though each may claim to support the GEM metafile format. As an example: EasyDraw v2.10 cannot read K-Spread v4.15 metafiles.

In this article we will look at the structure of the metafile. Next month there will be some simple routines for reading metafiles, splitting them up into their component parts so that we can fiddle with them, and writing them back out again. After that, space permitting, there

will be a chunk of code to produce a program for 'disassembling' metafiles.

The Metafile format

Firstly, two fundamental principles of metafile structure: these apply to both the header and the data blocks. The metafile is a file based on *words*: signed 16-bit quantities. It follows that all metafiles will be an even number of bytes in length. Furthermore, in all metafiles that I have investigated, the words are stored on the disk in the 'Intel' format; low byte followed by high byte. Therefore, if you use a hex dump program to view a metafile, you will have to change the byte order *and* take account of the sign bit in order to extract the information correctly.

Logically, the metafile contains two separate items: the header block and the data. The header block contains important information which tells a program how to interpret the data which follows. Table 1 gives the format of this block. To expand on some of the brief descriptions in the table; the first word of every metafile is set to $FFFF. By testing for this 'magic number', a program can quickly ascertain whether or not a file is a metafile. Programs should use the 'mh_length' field to find the start of the data area. This allows the header block to vary in size without causing problems.

Scaling information

The majority of the header is taken up with information about scaling. The commands in the metafile data area instruct the device driver to perform operations like 'draw a line from point x_1y_1 to x_2y_2'. In order to make sense of this, we need to know the scales of the two co-ordinate axes. For the screen, one is used to thinking in pixels: the monochrome screen has 640 pixels horizontally and 400 vertically. Similarly, one can devise a scale for printer pages: a laser printer writing at 300 dots per inch (dpi) onto A4 paper (approximately 8" x 11" allowing for margins) will be able to deal with 2400 'pixels' across the page, and 3300 vertically.

If we are to be able to use the full resolution of any output device, we must specify the contents of the metafile at as high a resolution as possible. It is the scaling of low resolution data up onto a high resolution device that produces coarse output which does not do justice to the output device. The reverse operation, high resolution data on a low resolution device, if done carefully, produces images limited only by the output device.

Accordingly, the metafile has a high resolution internal representation of the graphics, allowing GDOS and the output device driver to reduce the image resolution as necessary. Since each member of a co-ordinate pair in a metafile is a signed word, which can represent values from -32768 to +32767, we have a total of 65536 possible pixels in each direction. On our A4 sheet this would provide a horizontal resolution of 8192 dpi: more than enough for present output devices! Naturally, there is no need to use this full range, particularly if the

program used to generate the metafile does not permit the specification of graphics to such precision.

The header of the metafile contains the necessary data for such an internal co-ordinate system. The 'mh_system' flag indicates whether the metafile uses a standard device-independent co-ordinate system, Normalised Device Coordinates (NDC) or defines its own. NDC entries take values from 0 to 32767 for each dimension, and are specified by a flag value of 0. A flag set to 2 indicates that the metafile uses its own co-ordinate system (raster co-ordinates). Keen GDOS hackers will note that this flag seems to behave the same way as the work_in[10] input parameter to v_opnwk/ v_opnvwk. EasyDraw 2 appears to produce only raster co-ordinate metafiles.

In order for the output device driver to do the transformation from internal to output co-ordinates, it needs to know the lengths of the x and y axes in the metafile's units. By comparing these values with those appropriate to the output medium, a scaling factor can be derived and used to adjust the co-ordinate values of all objects in the metafile. This data is supplied in the four 'mh_coord_??' fields, which specify the co-ordinate values for two diagonally opposed corners of the metafile's 'page' (top left, bottom right). See the Box for details of how this applies to EasyDraw. The application processing the metafile may also need to know how these units relate to the real world. The 'mh_height' and 'mh_width' allow this to be done by specifying the size of the page in real units (size in 0.1mm blocks). Therefore one can calculate a dpi figure for the metafile: EasyDraw 2 metafiles seem to be written at 800dpi, 310 dots per cm.

The four 'mh_extent_??' fields specify the minimum rectangle which would enclose all the information in the file. This allows processing programs which cannot display the whole page at once to position their viewing window over the interesting portion of the page. Some metafiles have these fields set to 0, presumably indicating an undefined rectangle. Once again, the data is expressed as the internal co-ordinate values for the top left and bottom right corners of the rectangle.

The 'mh_bitimage' flag is supposed to be non-zero if there is bit image data in the metafile. I have not yet found a file with this flag set. Perhaps an owner of Supercharged EasyDraw could investigate this.

The Data Block

Immediately following the last word of the 'mh_reserved' header field is the data block, the description of the image. In order to discuss the format of this block, it is necessary to know some details of how programs utilise the VDI. Most of the following will probably be familiar to assembler programmers. Those who use C or other high-level languages will have been shielded from the full horror of the VDI interface by their GEM libraries (also known as GEM bindings).

Programs communicate with the VDI through several arrays of signed 16 bit words. There are two arrays for passing simple numerical data (characters, line colours, fill codes etc.) between the program and the VDI: one for input (intin) and one for output (intout). Likewise, there are two arrays for co-ordinate pair data: ptsin and ptsout. Each entry in the latter pair consists of an X and a Y value. Linking all four together is a fifth array, control, which determines how the others are used.

To call a VDI function a program writes the appropriate input data into intin and ptsin (as applicable), sets up control and then calls the VDI. When control is returned to the program, the function has been performed, and any output data has been written into intout and ptsout, from which it can be extracted and processed.

The control array has a prescribed format:

control[0]	Opcode	a unique code for each VDI function
control[1]	Nptsin	number of pairs in ptsin array
control[2]	Nptsout	number of pairs in ptsout array
control[3]	Nintin	number of words in intin array
control[4]	Nintout	number of words in intout array
control[5]	Subcode	some functions offer several different modes of operation, selecting amongst these is done by setting the subcode word to an appropriate value. More details on this next month.
control[6]	Handle	handle of the VDI workstation to use
control[7..n]	?	Extra data for some functions

Perhaps an example will make the procedure clear. Let's take as an example the VDI call v_gtext(handle,103,257,"Testing"), which prints some text on the screen. We set control[0] to 8 which is the code for v_gtext, control[1] to 1 because there is 1 co-ordinate pair. Control[3] is set to 7 (7 characters in the string). There is no subcode applicable for this function, so we can ignore control[5]. Finally the value of the variable 'handle' is written into control[6].

Having set up the control array, intin and ptsin must be initialised. Intin[0] = 'T', intin[1] = 'e' .... intin[6] = 'g'. The ptsin array is set up similarly: ptsin[0] = 103, ptsin[1] = 257. We can now call the VDI and the text will be printed. v_gtext does not return any values so we do not have to worry about the intout and ptsout arrays. In fact, for those VDI functions which are actually useful in metafiles, we will rarely need to worry about the output arrays.

Armed with this information, we can now decode the data section of the metafile. The block is made up of a set of records of the VDI calls made by the originating program to draw the image. Each record contains a stripped down set of the information we have already discussed: see Figure 2. Given this, it is easy to devise code to read in a metafile record:

```
opcode = read_word();
nptsin = read_word();
nintin = read_word();
subcode = read_word();
for (f=0; f<nptsin*2; f+=2)
    {
    ptsin[f] = read_word();
    ptsin[f+1] = read_word();
    }
for (f=0; f<nintin; f++)
    intin[f] = read_word();
```

where read_word() simply fetches the next word out of the file. This block is simply repeated until the file is exhausted. This event is signalled by an opcode word of 0xFFFF (-1): reading should stop immediately, there is no further data.

The Future

We have covered the basics of metafile structure. Some refinements to this outline will be presented next month, along with some C code for reading and writing metafiles. Listing 1 is a C header file which will be used by these routines. Already, some elements should be familiar to you: the C structure representing the metafile header, the VDI opcodes for the various functions and so on.

Tips

In a letter from *"the wilds of central Italy"*, John Durst writes concerning the modified form_do listing in February's Programmers' Forum:

"You don't always have to modify 'form_do' to fiddle with the cursor position: I enclose a skeleton listing for a much less ambitious but useful option, where the cursor is returned at the position of a faulty field, after a validation check."
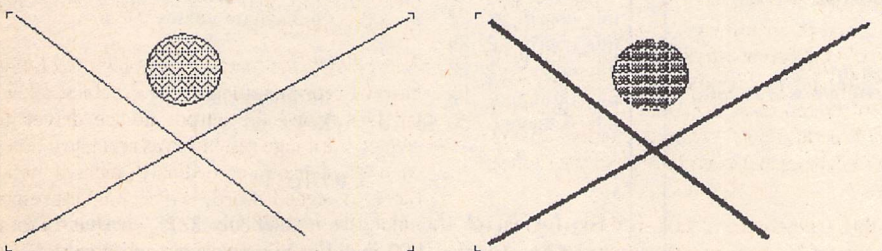
The code fragment is in Listing 2: thanks to

Figure 1: The results of scaling up the same figure, in either metafile (left) or bit image (right) format. Both images have been rendered coarse by the screen dump procedure, but the bit image file was degraded before.

John for this. Has anyone else got any similarly useful pieces of form_do associated code ?

Questions

John goes on to wonder if I happen to have an assembly language version of the form_do code. Unfortunately I do not have a full version, but I do have an assembly language conversion for the form_do loop, roughly equivalent to Listing 2 in the February issue. This is given in Listing 3. The GEM calls use a set of macro definitions: these may have to be modified to suit other systems. It should be trivial to recode the xform_keybd function and associated stuff in assembler, but I have not yet found the time. The program that this was taken from used the new form_do to perform all the normal dialogue box stuff, and to update the appearance of the box depending on a variable whose value was altered by an interrupt handler.

Les Kneeling of Ilford suggests that Programmers' Forum looks into producing a fast set of text display routines, the speed being gained by restricting the font to the system font, and possible text positions to byte aligned addresses. I'll give it some thought, but meanwhile, has anyone got anything similar already written ?

Submissions containing large chunks of text or source code (ASCII only please) should be sent on disk (have a thought for my poor ST's keyboard!) which will be returned if an SAE is included.
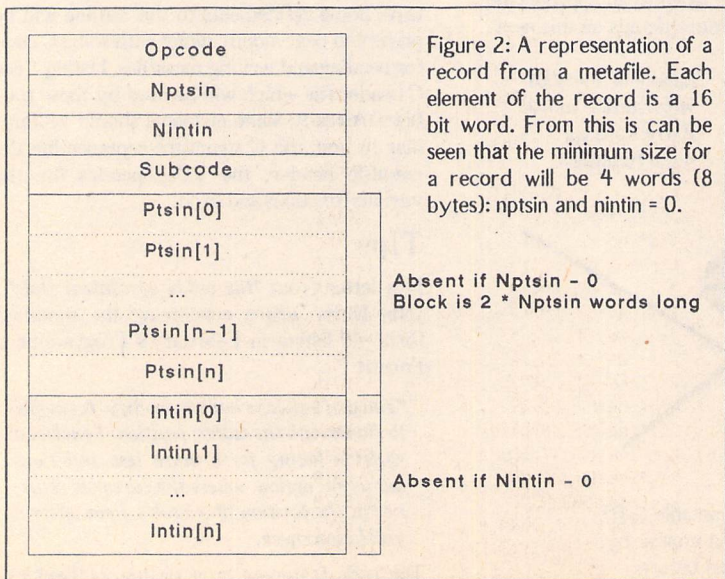
Jon Ellis

Programmers' Forum

29 Ashridge Drive

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AL2 3SR

EasyDraw v2.10 uses the various metafile header fields as follows. The page is divided into quarters, with the coordinate system origin in the centre of the page, as shown in the diagram above. Thus, if the page were 10 units wide, x coordinate values would lie between –5 and +5. Co-ordinate values increase from left to right and top to bottom.

The lengths of the axes vary with the size of the page selected, and with the orientation. The following data refers to portrait style pages, for landscape mode: the width/height and X/Y data are simply swapped round.

Given page size	Size in metafile	X range	Y range
8.5 x 11" Letter	20.32 x 25.40 cm	±3200	±4000
8.0 x 13" Legal	20.32 x 33.20 cm	±3200	±5200
11.0 x 17" Double	27.94 x 43.18 cm	±4400	±6800
14.8 x 21.0 cm A5	14.80 x 20.00 cm	±2294	±3100
21.0 x 29.7 cm A4	20.00 x 29.00 cm	±3100	±4495
29.7 x 42.0 cm A3	29.00 x 42.00 cm	±4495	±6510

PF

Figure 2: A representation of a record from a metafile. Each element of the record is a 16 bit word. From this is can be seen that the minimum size for a record will be 4 words (8 bytes): nptsin and nintin = 0.

Absent if Nptsin - 0
Block is 2 * Nptsin words long

Absent if Nintin - 0

Field	Offset from file start	Value	Description
mh_flag	0	-1	Metafile marker: always $FFFF
mh_length	2	24	Length of header block in words
mh_version	4	101	Metafile version number: 1.01
mh_system	6	2	Co-ordinate system flag
mh_extent_x1	8	xx	Metafile extents x1
mh_extent_y1	10	xx	y1
mh_extent_x2	12	xx	x2
mh_extent_y2	14	xx	y2
mh_width	16	2000	Page width in 0.1mm (eg 20cm)
mh_height	18	2900	Page height in 0.1mm (eg 29cm)
mh_coord_x1	20	xx	Maximum and minimum
mh_coord_y1	22	xx	co-ordinate values
mh_coord_x2	24	xx	
mh_coord_y2	26	xx	
mh_bitimage	28	0	Bit image flag
mh_reserved	30-48	0	Reserved space

Table 1

The format of the metafile header block in version 1.01 metafiles. Version 1.00 metafile headers seem to be only 14 words long, lacking the reserved space and bit image flag. A word is a signed 16-bit quantity. The field names are not official GEM nomenclature.

```
/***************************************************
**                Metafile Handler                **
**                =================                **
** (C) Jon Ellis, 1991 All commercial rights reserved. **
**                                                 **
** Listing 1. **                                   **
** Programmers' Forum June 1991 **                 **
**                                                 **
** Header file containing structures and definitions for **
** use with the GEM metafile handling modules.     **
**-------------------------------------------------**
** Filename: METADEFS.C Version: 1.00 Date: 10/04/91 **
** Compiler: Lattice C v5.06 Options: -cafk -j135i **
***************************************************/

/*
** Some gestures towards portability - you may
** need to revise these for your compiler
*/

typedef short WORD;          /* Signed 16 bits        */
typedef unsigned short UWORD; /* Unsigned 16 bits     */
typedef long LONG;           /* Signed 32 bits        */

#define TRUE         1
#define FALSE        0

/*
** The Metafile header block. Version 1.00
** files have no bit image flag and no
** reserved fields. Bracketed values are for
** v1.01
*/

typedef struct
    {
    WORD mh_flag;            /* Must be 0xFFFF         */
    WORD mh_length;          /* Number of words in header (24) */
    WORD mh_version;         /* Metafile version number (1.01) */
    WORD mh_system;          /* Coord system: (NDC=0, raster=2) */
    WORD mh_extent_x1;       /* Extent rectangle corners */
    WORD mh_extent_y1;
    WORD mh_extent_x2;
    WORD mh_extent_y2;
    WORD mh_width;           /* Page width in 0.1mm    */
    WORD mh_height;          /* Page height in 0.1mm   */
    WORD mh_coord_x1;        /* Page corner co-ordinates */
    WORD mh_coord_y1;
    WORD mh_coord_x2;
    WORD mh_coord_y2;
    WORD mh_bitimage;        /* True if bit image in file */
    WORD *mh_reserved;       /* Reserved space (9 words) */
    } META_HEADER;

/*
** Set of constants for use with the EasyDraw option block.
** Most are the same as the option's cognate VDI function.
*/

#define LETTER_PORTRAIT      0        /* EasyDraw paper types */
#define LEGAL_PORTRAIT       1
#define DOUBLE_PORTRAIT      2
#define LETTER_LANDSCAPE     3
#define LEGAL_LANDSCAPE      4
#define DOUBLE_LANDSCAPE     5
#define A5_PORTRAIT          6        /* "14.8 x 21 cm"       */
#define A4_PORTRAIT          7
#define A3_PORTRAIT          8
#define A5_LANDSCAPE         9
#define A4_LANDSCAPE         10
#define A3_LANDSCAPE         11

#define ON         1 /* Used for rulers, grid, snap */
#define OFF        0

#define NORMAL     0x00   /* Bitmap for text effects */
#define BOLD       0x01
#define LIGHT      0x02
#define ITALIC     0x04
#define UNDERLINE  0x08
#define OUTLINE    0x10
#define SHADOW     0x20
```

```
#define SIZE            0       /* Resizing mode         */
#define STRETCH         1

#define SQUARED         0       /* Line termination styles */
#define ARROWED         1
#define ROUNDED         2

#define SOLID           1       /* Line styles           */
#define LONG_DASH       2
#define DOTTED          3
#define DASH_DOT        4
#define SHORT_DASH      5
#define DASH_DOT_DOT    6

#define FILL_NONE       0       /* Fill modes            */
#define FILL_SOLID      1
#define FILL_PATTERN    2
#define FILL_HATCH      3
#define FILL_USERDEF    4

/*
** The EasyDraw v2.10 menu option block.
*/

typedef struct
    {
    WORD ed_version;        /* EasyDraw version number: 2.10 */
    WORD ed_objects;        /* Number of objects in file */
    WORD ed_strings;        /* Number of strings in file */
    WORD ed_paper;          /* Paper type: see above */
    WORD ed_rulers;         /* Rulers on ? */
    WORD ed_grid;           /* Grid on ? */
    WORD ed_text_style;     /* Text effects bitmap */
    WORD ed_text_font;      /* Text font index */
    WORD ed_text_size;      /* Text size in points */
    WORD ed_text_colour;    /* Text colour 0-15 */
    WORD ed_resize;         /* Resize mode ? */
    WORD ed_snap;           /* Snap on ? */
    WORD ed_snap_grid;      /* Grid resolution for snap */
    WORD ed_line_end1;      /* Shape of one line end */
    WORD ed_line_end2;      /* Shape of other line end */
    WORD ed_line_style;     /* Type of line used */
    WORD ed_line_width;     /* Width of line in pixels */
    WORD ed_line_colour;    /* Line colour 0-15 */
    WORD ed_fill_mode;      /* Type of fill to use */
    WORD ed_fill_style;     /* Fill style code 1-24 */
    WORD ed_fill_colour;    /* Fill colour 0-15 */
    WORD ed_pattern[16];    /* User defined fill pattern bitmap */
    } E_OPTIONS;

/*
** Definitions for EasyDraw measuring system.
*/

#define CM          310      /* Units per cm */
#define MM          31       /* Units per mm */
#define INCH        800      /* Units per inch */
#define I32         25       /* Units per 1/32 inch */

/*
** Basic VDI definitions
*/

#define VDI_ESCAPE      0x0005
#define V_PLINE         0x0006
#define V_FILLAREA      0x0009
#define GDP             0x000B
#define VST_ROTATION    0x000D
#define VS_COLOR        0x000E
#define VSL_TYPE        0x000F
#define VSL_WIDTH       0x0010
#define VSL_COLOR       0x0011
#define VSM_TYPE        0x0012
#define VSM_HEIGHT      0x0013
#define VSM_COLOR       0x0014
#define VST_FONT        0x0015
#define VST_COLOR       0x0016
#define VSF_INTERIOR    0x0017
#define VSF_STYLE       0x0018
#define VSF_COLOR       0x0019
#define VSWR_MODE       0x0020
#define VST_ALIGNMENT   0x0027
#define VSF_PERIMETER   0x0068
```

```
#define VST_EFFECTS        0x006A
#define VST_POINT          0x006B
#define VSL_ENDS           0x006C
#define VSF_UPDAT          0x0070
#define END_FILE           0xFFFF

/*
** VDI Escape subcodes.
*/

#define ESCAPE             0x0063   /* Subcode 99 functions */

#define START_GROUP        0x000A
#define END_GROUP          0x000B
#define NO_LINE            0x0031
#define SHADOW_ON          0x0032
#define SHADOW_OFF         0x0033
#define START_GDP          0x0050
#define END_GDP            0x0051

/*----EasyDraw specific escapes----*/

#define UNKNOWN1           0x0096        /* Function ? */
#define FULL_GROUP         0x0097
#define START_TEXT         0x0098
#define END_TEXT           0x0099
#define TEXT_FLAGS         0x009A
#define CLOSURE            0x009B
#define COMPOSITE          0x009C
#define TRANSPARENT        0x009D
#define OPTIONS            0x009E
#define UNKNOWN2           0x009F        /* Function ? */

/*
** GDP subcodes.
*/

#define V_BAR              0x0001
#define V_ELLIPSE          0x0005
#define V_ELLARC           0x0006
#define V_ELLPIE           0x0007
#define V_RBOX             0x0008
#define V_RFBOX            0x0009
#define V_JUSTIFIED        0x000A
```

** Listing 2 **

```
** Programmers' Forum June 1991
**
** Code fragment from John Durst demonstrating
** an easy way to handle field validation and correction
** in dialogue box handling.
**
```

* Program section dealing with text & date entry in dialogue box

* The box displays editable fields covering a single line memo
* entry and a 6 digit date. To be valid, so that the program
* can deal with it, an entry *must* have something in the text
* field and in the date field.

* This piece of routine checks both entries and goes back to the
* box, if either is empty with the cursor in the appropriate field.

* Set up data entry dialogue box

```
entry_box   move.l    #entr_txt,a0
            move.w    #23,d0
.loop1      clr.b     (a0)+           Clear out any existing text
            dbra      d0,.loop1       from entry text field

            move.l    #date_txt,a0    Clear out date field
            move.w    #6,d0
.loop2      clr.b     a0)+
            dbra      d0,.loop2
```

* The start object depends on whether a field is empty

```
            move.w    #3,d7           Set default start object = text
```

* Now go to the actual dialogue box subroutine.
* This is the point an invalid entry returns to:
* the subroutine is entered with the number of the
* editable field in register d7.

```
set_form    bsr       entry_dial
```

* Process the entries, first find out what ended the dialogue

```
            move.l    #xit_button,a0
            cmp.w     #4,(a0)         ?Was it CANCEL
            beq       show_list
```

* If it was CANCEL, return to the main list without change
* otherwise check the condition of the two editable fields.

```
            move.w    #2,d7           Start object = date
            tst.b     date_txt        ?Any date
            beq       empty

            move.w    #3,d7           Start object = text
            tst.b     entr_txt        ?Any text
            beq       empty
```

* There's something in both fields, so get memo entry
* into data block.

```
sto_data    ...
            ...
            ...
```

* otherwise

```
empty       bsr       ting
            bra       set_form
```

* Give a warning and go back to the dialogue
* with the cursor in the empty field.

** Listing 3 **

```
** Programmers' Forum June 1991
**
** Assembler version of xform_do main loop.
** This example has a regular timer-based
** update of a dialogue box built into it.
**
** Assembler system: MCC ASSEM v12
** Written on 3rd December 1990
**
**
** Local symbols...
**
KEY         equ       0
CLICK       equ       1
TIMER       equ       5

**
** Private offsets for xform_do stack
** local variables.
**

noexit      equ       -2
event       equ       -4
mx          equ       -6
my          equ       -8
button      equ       -10
shift       equ       -12
key         equ       -14
click       equ       -16

**
** The new form_do function which operates for
** the main dialogue box. This allows nice things
** like dynamic updating of the amount of buffer used
** etc. Call this with the mouse off.
**   Inputs:  ** MCTRL ON       **
**            d0.w      = Index of object to begin editing with
**            a4        -> Tree to be edited
**            a5        -> Variables area
**   Outputs: d0.1      = Index of exit object, poss with high bit set.
**   Destroys:d0-d1/a0-a1
**
```

STE Programming

When Atari introduced the STE, they boasted about its improved graphical capabilities such as hardware scrolling and the 4096-colour palette, and the improved sound capability - stereo DMA sound. Technical details on how to actually use these features were, as ever, very thin on the ground. In these articles Mathew Lodge aims to give details of all the new hardware registers present in the STE, and some explanation on how to use them.

Table 1 (over) gives the positions and layout of the display hardware registers. Some of these are in the same positions as their counterparts on the ordinary ST (such as the video address counter and palette registers), but are extended in some way.

Before explaining how to use the registers, a few notes on how video hardware works. The video processor of the ST fetches a number of words at a time from video memory in order to display them as pixels on the monitor. The number of words fetched depends on the screen resolution. In low resolution, four words are fetched and combined with the palette register to give sixteen pixels with sixteen independent colours. In medium resolution two words are fetched to give sixteen pixels with four independent colours, and similarly in high resolution, one word is fetched to give sixteen monochrome pixels.

The video base address is the first word that is fetched by the video processor. The video processor displays a screen one line at a time, and generates the "horizontal blanking" interrupt at the end of each line. During horizontal blanking, the electron gun of the monitor (which fires electrons at the coated glass screen, so making the pixels glow) is turned off, and the "target" of the gun moves back to the left hand side of the screen, ready to start the next line.

Normally, this interrupt is turned off, because servicing it would take an appreciable amount of processor time (because it happens so frequently, and so would slow down your ST). When all the lines have been displayed on the screen, the vertical blank interrupt is generated. It is so called because when it happens, the electron gun of the monitor is turned off and the "target" returns to the top left hand corner of the screen, ready to start all over again.

While it is displaying pixels, the video processor must keep track of where it is fetching words from, and this register is known as the video address counter. The first entry of Table 1 notes the first change in the STE: the video address counter is now writable as well as readable. This means that you can change the address of the word to be displayed by the video processor at any time.

This could be used to implement some sort of split screen facility, by changing this during one of the horizontal blanking interrupts to point to another area of memory.

The next register is an addition to the other two present on the ST, and it completes the video base address register, making it a full 24 bits in size. What this means is that the video base address can be placed on any word boundary -- and that's important for horizontal and vertical scrolling.

Vertical scrolling using just the video base address register is almost trivial -- to scroll down (that is, the image on the screen appears to move upwards) you simply add the width of the screen (in bytes) to the video base address. This is best done during vertical blanking to avoid flickering or jitter.

The next register contains an offset to be added to the video address counter at the end of each line. Normally, this is set to zero, so that video display lines appear to be contiguous in memory. The principal use of this register is to allow horizontal scrolling, which leads neatly on to the horizontal bit-wise scroll register, HSCROLL.

This register works by delaying the output of pixels to the monitor. If you set it to zero, there is no delay, and all sixteen pixels are output from the first data fetch. If you set it to one, the first pixel is missed, and the screen image appears to have moved one pixel to the left (i.e. the screen has scrolled right by one pixel.) Setting it to two makes the image move two pixels to the left, and so on.

When you want to scroll the display more than fifteen pixels to the right, simply increment the video base address and zero the horizontal scroll register. All clever stuff, but what about moving the screen to the left?

This can be done by applying the scroll right technique in reverse. To scroll one pixel to the left, decrement the video base address, and set HSCROLL to 15. To scroll two pixels to the left, set HSCROLL to 14, and so on. If you want a jerky screen display, you can do this at any time, but for smooth scrolling do all the updating during vertical blanking.

You can now do fine horizontal scrolling, but if you've tried what I just suggested, you'll find that the display appears to wrap around. That is, if you scroll right by one pixel, the first pixel that you've scrolled off the screen from the left hand edge of the second line appears at the far right hand edge of the first line. This is where the line offset register (LINEWID) makes itself useful.

The Atari documentation says of the LINEWID register:

"If you are actively scrolling (HSCROLL<>0), this register should contain the additional width of the display line *minus one data fetch* (in low resolution one data fetch would be four words, one word for monochrome, etc.)"

What they are trying to say is this:

If you fine scroll by n bits, then n bits are effectively missed off the left hand edge of the screen. But to get a complete line of pixels, n bits must be added to the right hand side of the screen. This constitutes one extra data fetch for the display processor beyond the usual requirement.

For example, if you had two low resolution pictures side by side in memory, and you wanted to scroll across them, you would set LINEWID to 80 (remember it's an *offset*) when HSCROLL=0 (no extra data fetch). When HSCROLL<>0, LINEWID would be set to 76 (four fewer owing to the extra data fetch done automatically by the display processor).

Finally, there is the new 4096 colour palette. An extra bit has been added to each red, green and blue component of each colour. To avoid compatibility problems with ST software, this new least significant bit has been placed in the "bit 4" position. If you find this difficult to cope with, then copy down this conversion chart:

Intensity:	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
													15		
STE (Hex):	0	8	1	9	2	A	3	B	4	C	5	D	6	E	7

Table 1 – Video Hardware

Addr	Access	Size	Use
FF8204	R/W	6	Video address counter (high)
FF8206	R/W	8	Video address counter (middle)
FF8208	R/W	8	Video address counter (low)
			The change here is that these registers are now read and write, allowing the programmer to update the video refresh address to any word boundary *at any time.*
FF820C	R/W	8	Video base address (low) (VBASELO) This register didn't exist on the ST, but on the STE it allows the positioning of the screen base address on any *word* boundary.
FF820E	??	8	Line offset (LINEWID) - the number of extra words added to the address counter at the end of each line, *minus one data fetch.* This allows for virtual screens that are wider than the actual screen display. Clearing this register means the STE acts like an ordinary ST.
FF8240 to FF825E			Colour palette

There are now four bits for each of the red, green and blue components. To give backward compatibility with the ST, the least significant bit is placed above the most significant bit. Thus the register layout is as follows:

```
xxxx 0321 0321 0321; x=don't care
     RED GRN BLUE
```

| FF8264 | ?? | 4 | Horizontal bit-wise scroll register (HSCROLL). Allows the start of each line to be delayed by 0-15 bits, thus giving instant horizontal scrolling. |

```
xform_do   movem.l    d1-d5,-(sp)      Stack non-GEM registers.
           link       a3,#-16          Create some space for locals
           move.w     d0,d3            New object to start editing.
           clr.w      d4               No current edit object.
           st         noexit(a3)       OK to continue.
1$         tst.w      d3               Begin editing a new object ?
           beq.s      2$               No, can skip this.
           cmp.w      d4,d3            Still on same object ?
           beq.s      2$               Yes, skip.
           Objc_edit  a4,d4,#0,d5,#EDEND Turn off old object.
           move.w     d3,d4            Accept new current edit object.
           clr.w      d3               Clear new object flag.
           Objc_edit  a4,d4,#0,d5,#EDINIT Initialise new object.
           move.w     Intout+2(a6),d5   d5 holds cursor position.
2$         Evnt_multi #(MU_KEYBD!MU_BUTTON!MU_TIMER),#2,#1,#1,
                      #0,#0,#0,#0,#0,#0,#0,#0,#0,#0,#0,#250,#0
           move.w     d0,event(a3)     Save the return data
                                       from the event.
           move.w     Intout+2(a6),mx(a3)
           move.w     Intout+4(a6),my(a3)
           move.w     Intout+6(a6),button(a3)
           move.w     Intout+8(a6),shift(a3)
           move.w     Intout+10(a6),key(a3)
           move.w     Intout+12(a6),click(a3)

           btst.b     #KEY,d0          Key pressed ?
           beq.s      3$               No, check next event.
           Form_keybd a4,key(a3),d4    Offer the key to the system.
           move.w     d0,noexit(a3)    Save the finished flag.
           move.w     Intout+2(a6),d3  Copy new object flag.
           move.w     Intout+4(a6),d0  Get possibly altered key.

           beq.s      3$               If already handled, skip.
           Objc_edit  a4,d4,d0,d5,#EDCHAR Write the character in.
           move.w     Intout+2(a6),d5  Update the edit index.
3$         btst.b     #CLICK,event+1(a3) A button clicked ?
           beq        5$               No, can skip this.
           Objc_find  a4,#0,#9,mx(a3),my(a3)  Find the
                                       object clicked.
           cmp.w      #-1,d0           Any object ?
           bne.s      4$               Yes, handle it now.
           bsr        bell             Tell the user they
                                       missed the form !
           bra.s      5$               Skip on
4$         Form_button a4,d0,click(a3) Give the click to the system.
           move.w     d0,noexit(a3)    Save the exit flag.
           move.w     Intout+2(a6),d3  Set the next object flag.
5$         btst.b     #TIMER,event+1(a3) A timer event ?
           beq.s      6$               No, skip on.
           cmp.w      #1,panel_on(a5)  Showing the control panel
?
           bne.s      6$               No, nothing to do.
           move.l     d5,-(sp)         Save our variable across the
           moveq      #1,d5            screen update call. Update
           bsr        info             top line only.
           move.l     (sp)+,d5
6$         tst.w      noexit(a3)       Finished yet ?
           bne        1$               No, can continue.
           Objc_edit  a4,d4,#0,d5,#EDEND Turn object editing off
           move.w     d3,d0            Copy the next object.
           ext.l      d0               Ensure top bit set.
           unlk       a3               Pop off locals.
           movem.l    sp)+,d1-d5
           rts
```

CAD Column

Programmers are invited to contribute this month. Joe Connor reckons if you can code you can draw, but just to make it easy he takes the first tentative steps...

I also want to try a set of fast ROMs but unfortunately they are both expensive and hard to come by. If anyone has successfully installed a set with Adspeed please contact me at the usual address.

Perhaps the recent success of re-released pop singles inspired Michtron to relaunch Master CAD. Originally released in 1988 for £150, it is now available for £29.95. Master CAD constructs 3D drawings using the usual extrusion and rotation methods. Individual components can be loaded and merged to build up complex drawings. Simple 2D drawings can also be generated and dimensioned. The program runs in both high and medium resolution and requires a minimum 1Mb of memory. Contact: Michtron, telephone: 0726 68020.

News

A new module for Megapaint II, called Objectmaker, will soon enable bit image files such as .IMG and Degas to be converted to Calamus .CVG or .GEM vector format. Hand produced drawings could then be scanned into memory, converted to vector format, and exported to CAD software.

After conversion, drawings could be re-scaled, modified, re-printed and archived on disk. Objectmaker is not yet available in the UK but can be purchased direct from Tommy Software in Berlin for DM299. Contact: Telephone +49 30 6214063, Fax +49 30 6214064. If you need this service now contact Expressworks on 0252 726255. They can obtain 'very good results' using a 'secret' (convoluted) method. They also have available the latest CRP A4 and A3 digitizers complete with overlays for DynaCADD and Campus/Technobox CAD.

ICD Adspeed user update

I decided to move the Adspeed board to a Mega ST4 and entrusted the 68000 chip desoldering to Atari Workshop. Everything functions perfectly at 8MHz but unfortunately the computer hangs immediately 16MHz mode is activated. Switching off the Blitter solved the problem but if you are trying to squeeze the last ounce of speed out of your ST it seems a retrograde step to switch the Blitter off!

Crafty Drafting

Both GFA Draftplus and BeckerCAD are able to process command files through integral interpreters. This powerful feature is under-used and under-rated. Tedious, repetitive or complex tasks can be programmed instead of drafted. Programming can, to some extent, help overcome the limited range of tools available, compared to more expensive CAD programs such as DynaCADD and Campus (which, currently, cannot be programmed!). Even simple routines can generate whole families of symbols FREE. Proficient programmers can probably generate symbols quicker than CAD operators could draft them! So if you can draft, learn to code, and if you can code and fancy a go at drafting, this is the ideal way to start.

Any routines developed and sent to me will be pooled and made available to all contributers. Send disks to: Joe Connor, 65 Mill Road, Colchester, CO4 5LJ.

BeckerCAD includes a complete programming environment using a set of PostScript style commands. No external programs are necessary but the programmer is restricted to the built-in language. Access is via the Interpreter option in the Work drop down menu.

GFA Basic was used to generate waveforms in Draftplus. Each waveform was defined by changing the equation in the highlighted line and the program run to generate a new command (.MAC) file.
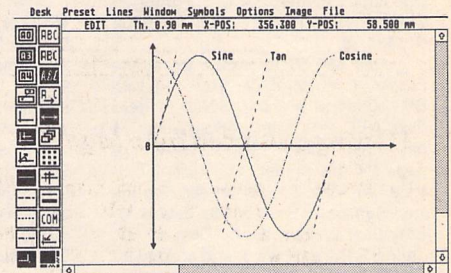
Draftplus takes a different approach. One-line command strings may be entered directly into a command line. More complex command files can be written using a text editor or generated using *any* programming language. The resultant files are loaded and processed through the command line.
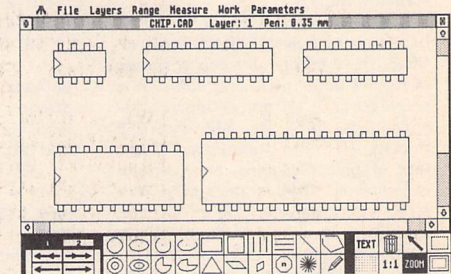
In this example whole families of chip outlines are generated simply by changing the overall width and number of pins for each configuration. Using a similar method, programs could be written to generate other standard components.

Classified Adverts

FOR SALE

Easy Text Plus V.1.3J, 9 Pin Printer Driver (Epson Compatible), original with users guide and extra fonts disk £10.00. HiSoft Twist Application Switcher, original with Users Guide. £10.00. Atari Software – Borodino, Bridge Tutor, Backgammon, GoMoku and Hyperdraw. £10.00 each. Phone 0256 896879. (8)

Hyperdraw plus manual, boxed £15. Degas Elite with manual, boxed £12. Andrew Jones: Tel:- 071 267 9791. (8)

Migraph Hand Scanner + Touch-up £120. CAD3D2 + Cybermate + Cybersculpt £40. Timeworks DTP + Users' Guide £30. GFA GEM Utility Package £8. GFA Companion £5. Fastcom £10. K-Graph 2 £4. £1 postage on each: John Mallinson 071 589 1952. (7)

Desperately seeking arcade–freak playmate: barely used and unused games; Black Lamp Barbarian, Silicon Dream (with hints), Laser Squad, Legend of the Sword, The Pawn, The Grail, Tanglewood, Masters of the Universe, Rampage, Prison, A D+D Hillstor, Mike Read's Pop Quiz, Dragons Lair 11. I need the shelf space and will accept any reasonable offer. Telephone Oxford (0865) 247585 or write Dennis Douglas, 6 Aston Street, Oxford OX4 1EP. (8)

K-Spread 3, v3.75. Current as of Jan 24th. Unregistered, not what I thought it was. David 0505 22650. (8)

Citizen 120D Nine Pin Printer and Lead. Very Good Condition. £80. Tel:- 081 422 9099. (8)

MIG 29 £18.00, Galdragon's Domain £5, HyperDraw £10. Forget Me Clock £15. Phone:- Iain on 0702 610424. (8)

Atari 520 ST upgraded to 1Mbyte floppy, 1 Mbyte RAM, TOS 1.4 with SM124 Mono monitor, 50Mbyte hard disc, NEC P6+ high performance 24 pin printer. Citizen HQP45 Wide carriage 24 pin printer, Multiface ST, 3 Mice, Joystick, Leads, printer ribbons etc. Software: Protext V5, Lattice C, Easydraw 2, Easy tools, Devpac ST, Knife ST, Fontkit Plus 3, and around 50 discs full of public domain software. £1100 o.n.o. Tel: 081 806 6189. (evenings). (7)

Citizen LSe-10 9 Pin Dot Matrix Printer, complete with original box, manual and two spare ribbons. £80. Phone: 0757 705376. (9)

Brother HR15 printer, daisy wheel, serial, £100. Data transfer switch, 25 pin, £15. Dataphone Designer modem with software, £60. Contact Bill Putnam evenings on 0305 267269 (Dorset area). (7)

DAATAscan Pro A4 Scanner based on Mitsubishi. Hand held and Sheet Feed facility allowing scanning of full A4 page, including software to scan 100, 200, 300 and 400dpi resolutions. Save in Degas, IMG and TIFF formats. TIFF files portable to PC and Mac graphic packages. New, boxed, unregistered. Original price £599.95 – All sensible offers considered. Original software, Kuma K-Spread 4, GDOS support for fonts and graphics. Unused and unregistered including ring-bound manual. Contact Salim on Leicester (0533) 544096 after 6.30pm weekdays or all day weekends. No timewasters please! Buyer to collect. (8)

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HiSoft C Interpreter £25. VIP Professional £20. Microsoft Write £20. Falcon £10 . Phone Tim: 0322-275755. (7)

Silver Reed EXP500 Daisy Wheel Printer, as new condition with ribbons and extra daisy wheel. £80.00. Newbrain a 32K Computer with software and books. £50.00. Tel: 0237 813611 (day) or 0737 350784 (evenings) (Epsom area). (7)

Atari 520 STFM, SM124 Mono Monitor, Citizen MSP-10E Printer. Loads of software, all with manuals and in perfect condition. Total Value Over £1000. Quick sell at bargain price of £415.00, ono Tel:- 081-907-1255 and ask for Aynit. (Possibly deliver). (9)

TOS 1.2 Two Rom set £10, ST PSU £20, NEC D/D disk drive mechanism (suitable for internal fitting) £30. Quickshot 11 Autofire Stick £5. Obliterator, Flight Bomber and Carrier Command £5 each. Postage extra. Derryck Croker 0923 673719 (Watford) (7)

Star LC24.10 Printer, very good condition. Home Use Only. Spare Ribbons & PD Printer Utilities. Will deliver within 20 miles of Heathrow Airport. £175. ono. Call Adam on (0895) 445796. (Eves) (7)

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Citizen 120–D 9 pin NLQ printer. 240x216 dpi graphics, boxed, 2 spare ribbons, single sheet feeder, tractor feed. Manual card parallel cable included £80. 0484-534501. (7)

Golden Image Hand Scanner for ST or STE with Touch-up software. As new. £130.00 ono. Tel: 0227 768056. (9)

Mini Office Spreadsheet £10.00, Share Master £50.00, Verminator £10.00. If interested contact John on 071-260-2885 (7)

ST "Professional Pack" boxed, sealed and unopened, complete with all manuals. £65. Comprises Hyperpaint, HiSoft First Basic, STAC, Prince and Kuma ST-Word, ST-Base, ST-Calc and ST-Graph. Evenings Tel 081-366-2151. (7)

Don't buy a PC Emulator for your ST when you can have the real thing for less! Opus PC11, 1Mb ram, 3.5" Disk Drive, 20 Mb Hard Disk, Hercules Monitor, MS DOS and Software. Whole Lot for £200. Call John (0252-716711). Buyer collects. (7)

Citizen C–120D 9 Pin D/M Printer, two spare ribbons, owner's manual, printer stand, seen working. Buyer collects. £55.00. Ring 0432 (Hereford) 356520. (Can chuck in ST Lead!) (7)

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Epson LQ800 24 pin printer. Friction/tractor feed, parallel and serial interface. 180 cps draft, 60 cps LQ. All manuals, original box and single sheet guide, plus 2000 sheets quality paper. Also, good selection PD fonts, drivers, etc for above. £185. Phone Keith: 0244 880091. (7)

Devpac ST Wercs, Twist, Hi-Soft Basic. Still in original boxes unused and not yet registered. First Word Plus, Superbase, ST Basic, Microsoft Write – all unused. Total original cost £250 +. Offers for the whole lot. Tel 0226-765106. (8)

Olympus OM40 with standard 50mm Zuiko Lens, Sirius 28–70mm Macro Zoom. T20 Flash, Vivitar 2500 Zoom Thyristor Bounce Flash, Tripod, Winder, 2 Motor Drive, Soft Carry Bag, Various Filters. All in perfect working order. No Manual! Well used, gives excellent results. £250 or swap for Atari ST Hand Drive of 20 Meg or more. Phone 0275 375496 Evenings/Weekends. (8).

1040 STF (no modulator, monitor required!) £250 including Microsoft Write WP software and five games, in perfect working order. Phone Clive Parker on 0275-375496 after 6pm. Quick sale wanted, as I am upgrading to Mega 4 or TT. (7)

Postscript on a shoestring – FSP 1.1 + Postscript driver £50. Also, K-Graph 3 (ver 3.3) £18. Script £24. Turbojet (HP Inkjet GDOS driver £15, Megapaint 11 (ver 2.3) £45. Tel: 0792 371286. (7)

Atari 520 STFM with 1 Meg Internal Drive, mouse and mat, joystick, manuals, magazines, dust cover, lots of software in lockable disk box including games, databases, wp's etc. All in immaculate condition. £280. Ring (0342) 327072 (East Grinstead,

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The Blag (ST) – huge detective adventure on two extended format S/S disks. Features digitised graphics, printed manual and free pen: £7.99 plus 50p P&P. Apply G. Atkinson, 60 The Green, Rowlands Castle, Hants, PO9 6AB. (10)

2 x 1Mb internal replacement disk drives for ST, £40.00 each. 1 Mb internal replacement drive for ST (Citizen) £30.00. Contact: Colin on 0270-780257. (7)

FZ1 Shareware. 100's of sounds from USA & UK. SAE for List. 50p/Disk if you supply, or £1.50 (DD), £2.50 (HD) + P & P if I supply. Contact Brian at "Kave Studios" on 0909 486971. (9)

WANTED

Programs/articles/books wanted, on the game of Draughts. Phone Nick on Dunstable (0582) 602941, weekdays after 6.00pm. (7)

Frequency Modulator for early Model ST. Phil Adams. 11 Huddersfield Road, Delph, Oldham. 0457-870024 (8)

Does anyone have any Mean 18 course files, other than the six available from Accolade? If I can gather enough together, perhaps a disk full could be added to the ST Club library? Phone Steve on 0923 265539. (7)

Infocom adventures – Bureaucracy, Hitch Hikers' Guide, Beyond Zork, Nord and Bert. Must be original versions (i.e. not the new budget copies) with all original material. Phone Steve on 0923 265539 (Watford/Hemel area). (8)

GENISCAN SCANNER – Has anyone found/written some software which works on the STE and will capture images larger than screen size? Needed desperately. Phone Tim on 0602 224773l. (7)

GENERAL

Treknet – A new club for all fans of Star Trek. Great club magazine, produced on ST's, for information contact:- Captain Angie Jarrett, 46 Regis Crescent, Milton Regis, Sittingbourne, Kent. ME10 2ES. Telephone: (0795) 471970. (7)

Postscript Printing Service for Timeworks DTP and FSP3. Excellent quality laser output for only 90 pence per page. Also laser output of various graphic formats including IMG, GEM and Pl3. Send your disk plus cheque, or £2 for further details, font charts and examples of the quality obtainable to:- E, Nelson, 3 Woodview, High Street, High Littleton, Bristol, BS18 5HT. (7)

Crystal Tower BBS 01–886–2813 24hrs 300–2400 Baud (Towernet System) Atari ST, PC, Languages, Comms etc + much more. All callers welcome. (R)

Guide Dogs for the Blind Appeal – Please send used postage stamps to help this worthy cause to: 19 Dunloy Gardens, Newton Abbey, Co. Antrim, BT37 9HZ. (R)

STARGATE BBS: 0476-74616 V21 V22 V22BIS V23 Atari ST section; also PC, Amiga and Comms areas. Comms help and advice for ST and PC via ST Editor. Give it a call and leave a message. If you need comms software get Uniterm from the ST Club. (R)

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Authorware

Every issue of ST Applications will feature advertisements and notices about products that are published by their authors. With the depressed state of the market for non-games ST software, many products that deserve to be published are not being taken up by publishing houses. Special-interest software, in particular, is very difficult to place with a suitable publisher. Self-publishing of software is only viable when there is a cost-effective advertising medium, or an active and responsive market for Shareware.

To get the ball rolling, there will be no charge for Authorware advertisements in the next few issues of ST Applications. In future issues all Authorware products will be given a free 20-word listing, and display advertisements will be available at a preferential rate. The only requirements are that the product should be of a suitable quality, ST Applications are given a review copy of the software, and the publisher/author should not be VAT registered.

Authorware is envisaged as a complimentary system to Shareware; Authorware entries and advertisements are an effective way of keeping users up to date on the features in the "registered users only" versions of Shareware packages.

If you would like to see your software featured in the ST Applications Authorware column please send us a review copy of the software and a rough outline of the advertising copy you would like to be printed.

STEN

ST ENthusiasts disk magazine - for your copy send a disk + SAE to:

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The ST adventure magazine on disk! Reviews, solutions, hints, special features and much, much more. Runs in colour only. Produced bi-monthly. SynTax costs £3.50 an issue, £20 for a year's subscription in the U.K./Europe. Outside Europe, by airmail it costs £5.25/£30. Cheques made payable to S. Medley should be sent to 9 Warwick Road, Sidcup, Kent DA14 6LJ.

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It is available at £5 (including postage) from David Waller, The Standon School, Molrams Lane, Great Baddow, Chelmsford, Essex, CM2 7AQ. Cheques should be made out to 'Sandon School'.

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Back Issues

For four years prior to the launch of ST Applications, The ST Club produced "The ST Club Newsletter"; this experience has formed the building blocks for this magazine. Whilst the layout and content of ST Applications has altered, enabling us to tackle more ambitious, long-term projects and have up-to-the-minute news and reviews, you may find the back issues of the newsletter of some interest. The following is a list of the back issues available, with a brief outline of the content of each Newsletter.

Newsletter Issue 28

Reviews: Calamus, A Book on C, STOS, HP Desk Jet Plus, Fontkit Plus Tutorial I, Football Crazy, Canvas, Goliath 2, Hi-Soft Forth. Articles: NEC P2200 Ribbons, First Steps in Prolog - I, Monitors - adding an audio amplifier, GEM Retrace, News from Japan.

Newsletter Issue 29

Reviews: Le Rédacteur v3, Citizen Swift Printer, Calamus Outline Art, Hyperpaint. Articles: First steps in Prolog - II, Some thoughts upon learning C, Fontkit Plus Tutorial II, Canadian News.

Newsletter Issue 30

Reviews: Atari Tower, K Spread 3 & K Graph 3, PC Ditto 2, PC Board Design, Lattice C version 5. Articles: First steps in Prolog - III, Calamus Comment, Hardware - DMA Port and Hard Disks, Fontkit Plus Tutorial III.

Newsletter Issue 31

Reviews: Supercharger version 1.4, Xenomorph, Scanner Appeal, Zubair Z-RAM Board, Resolution 101, Chronoquest II. Articles: First Steps in Prolog - IV, Cupertino Cowboys, DIY Half Meg Upgrade, Fontkit Plus Tutorial IV.

ST Applications Issue 1

Reviews: NeoDesk3, Universal Item Selector III, Deluxe Paint ST, Easy Draw 3, Tristan, PD Adventure Games: Invasion and Darkness is Forever; Jeremiah's Journal: Adventure Probe Convention, Operation Stealth, Tamoret; Book Reviews: C: A Dabhand Guide, The Oxford Dictionary of Computing; Articles: Computer Entertainment Show '90, MIDI Hands on Show, MIDI in the UK, Fontkit Plus Tutorial V, That's Write, Hard Disk Backup, Searching Directory Trees, MIDI Software in C, Reading CP/M disks; Gadgets by Small; Regulars: PD Update 11.1, Forum, CAD Column, STicks and STones.

ST Applications Issue 2

Reviews: NeoDesk CLI, Le Rédacteur v3.03, Megapaint II, Protext v5, Jet Setters (Inkjet printer), Dr. T.'s Tiger Cub, Headstart; Articles: Whistle Stop Tour, Fleet Street Publisher 3 or Timeworks?, TeX Notes, Fontkit Plus Tutorial VI, ST Parallel Port Buffer, MIDI Software in C; Regulars: PD Update 11.2, CAD Column, GFA Problem Page, Programmers' Forum, Adventure Column, Forum, STicks and STones.

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ST Applications Issue 6

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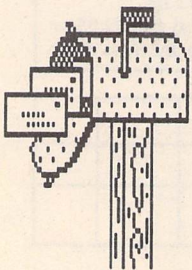
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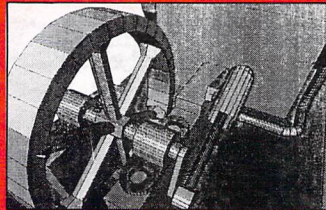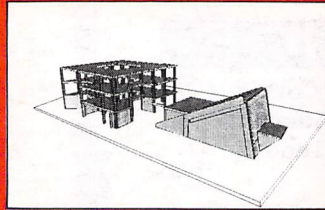**Gastiners' Great Give away Give away Give away Give away Give away Give away**