Price: £2.50

ST APPLICATIONS

The Magazine for Users of Atari ST, STE, Falcon and TT Computers — *Issue No. 37, January 1994*

THIS MONTH

Reviews

- Devpac 3
- Warp 9 v3.8

Articles

- Timeworks Tips
- Titan Designs
- Using GFA Basic Pt 4
- Colours Everywhere
- Monitor Life Preserver
- DeskJet A5 Loader
- Camera Shutter Timer

Regulars

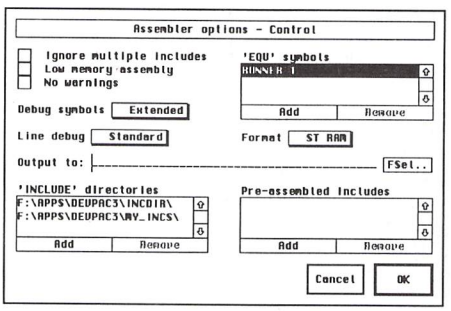
- News
- CAD Column
- Desktop Discussions
- Programmers' Forum
- Beginners' Forum
- Going On-Line
- Forum
- Grafix Arts
- Falcon News & Forum
- Classified Ads

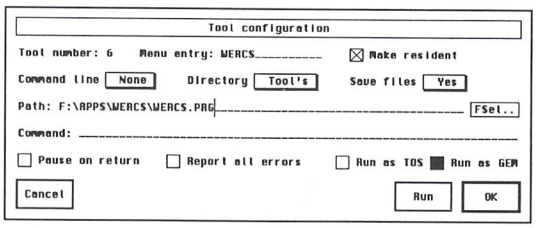
Timeworks Tips

The ST Club office gets the occasional query about how certain effects are achieved in the magazine layout with Publisher 2. David Smith explains how he manages to incorporate large titles and headings and also how he tries to maintain a certain level of vertical justification in these pages.

Devpac 3

Graeme Rutt looks at the latest version of HiSoft's Devpac and is hugely impressed by the overall strength of its comprehensive features.





DIY

APPLICATIONS FALCON

- Falcon News
- Falcon Forum

Plus:

Piper recounts his hands-on experience of the new version of the screen accelerator first reviewed in March this year. V3,8 comes in three different guises and it is the Falcon-flavoured incarnation that gets Piper's full attention.

Projects for a Winter's Night...

Two Do-It-Yourself articles for those of you who find it hard to while away long winter evenings: one enables you to load A5 paper from the DeskJet sheet-feeder without it going skew-wiff, while the other uses a combination of hardware and software to check the accuracy of your camera shutter.

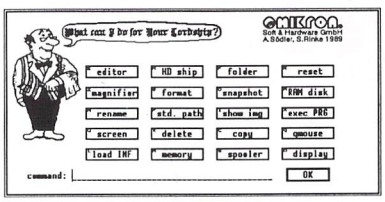
Printed in the U.K.

Post Office: Non-deliverable copies should be returned to The ST Club, 7 Musters Road, West Bridgford, Nottingham, NG2 7PP

Mortimer

Your very own computerised butler!

- Editor: view and edit texts and IMG pictures.
- HD-Ship: park your hard disk.
- Disk Functions: New folder, Rename, Copy, Delete files, and Format disks.
- Magnifier: integrated screen magnifier.
- Snapshot: grabs all or part of the screen and stores it on disk as a picture file.
- Screen: built in screen saver and 50/60Hz frequency toggler.
- RAM disk: flexible RAM disk that expands to the size required.
- Programs: TOS programs can be run from within Mortimer.
- Calculator: convenient pocket calculator with lots of functions.
- Spooler: allows you to work with the computer while your printer is working.
- Mouse: dynamic mouse accelerator with lots of configuration options.
- Ascii: shows ASCII table of all characters.
- Memory: gives an overview of the current memory allocation.
- Display: displays time and date.
- Keyboard macros: you can assign any text(s), sentences and function keys to keys or key combinations. For instance, [Alternate]-[S] might produce "Dear Sir,".
- Virus guard: Mortimer will protect your disks from boot sector viruses, and will detect link viruses when they try and spread to your files.
- Mortimer is memory resident and available at all times from within all programs. When installed, Mortimer reserves just 64K of RAM - all Mortimer functions are linked to a sophisticated memory manager.
- Mortimer version 1 is compatible with all TOS versions up to 1.62. The MegaSTE, TT and Falcon version - Mortimer DeLuxe - will be available December.
- Supplied with a very comprehensive 82-page printed manual.



Price: £14.95

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Protect your Atari investment

We are the UK distributors for the Gemulator ST emulator for IBM compatible PCs. Write or phone for our free information book.

FaST Club
7 Musters Road
West Bridgford
Nottingham
NG2 7PP
Tel (0602) 455250
Fax: (0602) 455305

Run ST software on your PC!

PixArt

A feature packed true colour pixel painting program that supports all ST, TT and Falcon screen resolutions.

Features:

PixArt has very creative block manipulation facilities that will be of great use to DTP users. Block functions include rotation, mirroring, slanting, distortion, projection onto grids; it's astonishing what is possible, and the speed at which it is all done is breathtaking.

Draw any way you choose: brushes and nibs, pencils and crayons, all can be used easily and give clear results.

Graffiti artists come into their own with the spraycan tool. Radius and intensity are easily changed, as are the colour and fill pattern.

You can zoom in or out of the picture and still use all drawing tools.

The PixArt magnifying glass allows you to view all of a large picture in a window, and even here you can still use the drawing tools.

Supports resolutions from 320x200 to 32000x 32000 pixels, monochrome to True Colour.

Picture file formats supported include: IFF, TIF, Degas, ESM, PCX, PIX, IMG, NEO, TGA, BIG (DRAW), PIC, and LBM.

Direct scanner support via GDPS driver system, and graphic tablet support via the Crazy Bits driver system. These drivers are provided with many kinds of scanner/tablet, or they can be ordered independently if necessary.

Comes with printer drivers for 9-pin and 24-pin dot-matrix, Atari SLM, HP LaserJet, and DeskJet 500C/550C (colour).

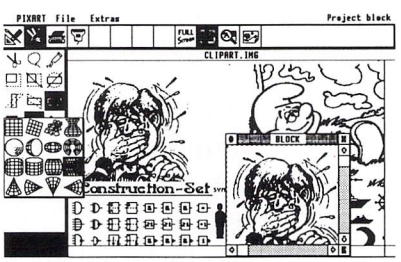
PixArt works with all known graphic cards, including True Colour cards that allow you to work with photo-quality pictures.

Compatible with TOS versions 1.2 through to MultiTOS. Fully Falcon compatible. 1MB RAM required. Large pictures need more memory. PixArt also uses TT-RAM.

Price: £34.95, Available: Now

PixArt IC: For compatibility with colour dot-matrix printers PixArt is available bundled with Imagecopy 2. Price: £49.95.

PixArt T: Bundled with Textstyle, which allows PixArt to incorporate text generated from Calamus fonts. Price: £44.95



PixArt is ideal for creating invitations, greetings cards, awards and certificates, report covers, labels, tickets, tokens, menus, posters, brochures, price tickets, letter-headings, logos, door signs, and more. The possibilities are only limited by your imagination!

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CREDITS

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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.

ATARI NEWS

Atari Opens The Cage!

The Atari Jaguar was finally unleashed upon the unsuspecting populations of New York and San Francisco on 15th November 1993. First signs were positive with Atari shares hitting $12 each, compared with less than $1 prior to the announcement that IBM were to manufacture the beast. The number of machines available prior to Christmas is expected to be small. I've heard all sorts of weird and wonderful figures. At one point a long-established publication renowned for their accuracy were talking in terms of 150,000-200,000 for The States and up to 30,000 units for Europe. Several days later, Atari's official press agency in The States were talking about 40,000 units for the USA and 10,000 for Europe. For once, I'm more inclined to believe Atari!

Despite uncertainty over the exact numbers involved, I can tell you where to get them, subject to availability of course! HMV, Virgin and independent retailers supplied by SDL and Thornley Distribution are the only stores which will have the Jaguar in stock prior to Christmas. The price has been set at £199 and will include the futuristic looking joypad and the game Cybermorph. Three other titles are said to be available immediately, with another eight expected by the end of the year. Being more realistic, I'd be surprised if more than half a dozen games are out before the New Year.

Atari's Bob Gleadow was in New York for the Jaguar's debut to the US market. He said, "Atari are committed to 41 titles but that list will expand. If we come out with 100 titles, that will be a lot, but it's a realistic target." The industry's support for the machine was further demonstrated with the announcement that Gremlin Graphics, Microprose and 21st Century Software have also signed up to produce Jaguar software. Gremlin's David Martin said, "We looked at the technical specs of the machine and suddenly the decision was an easy one. You simply have to support it." Paul Hibberd of Microprose said, "For the first time, we will be able to take our top quality software onto the console stage without having to worry about hardware restrictions." Industry veteran Andrew Hewson, now MD of 21st Century Entertainment, said, "The Jaguar is miles ahead of any other cartridge-based console." All three companies have already begun work on their Jaguar projects which include Gremlin's Zool 2.

Atari President Sam Tramiel mentioned the possibility of a computer being built around Jaguar technology. As I've said before, the Jaguar is a state of the art console, but would make a lousy computer, were you simply to connect a keyboard and a disk drive to it. However, the use of Jaguar technology built into a 'real' computer would lead to a machine which could easily outperform many of today's low end workstations. The cost is obviously prohibitive with today's technology, but it should be feasible in four of five years' time. It's probably going to take near enough as long as that to develop it anyway.

Another project on the drawing board is the Jaguar II, destined to hit the market in 1996. It will be much faster than current technology permits and is almost certain to be CD based, since CD software will have become pretty much commonplace by then. Talking of CD, Atari's CD-ROM drive for the Jaguar is to make its debut at the Las Vegas CES in January. Although it is being offered as an optional extra, it is expected that a bundling deal will be announced as CD software starts to appear. The CD-ROM drive designed for the Jaguar is described as a 'dumb drive' since it uses the Jaguar's memory, rather than having its own. Doesn't this remind you of the SLM804? It means that the drive will be a lot cheaper than 'traditional' CD-ROM units but won't be of any use to you if you change machines. Originally the expected price was put at around $300, but I have seen one publication quote it as low as $100. I seriously expect the real price to be set somewhere between these two guestimates. As usual, this is likely to translate dollar for pound by the time it crosses the Atlantic!

Lynx Alive And Kicking?

Despite lack of support from the high street chain stores, the Atari Lynx is refusing to bow out. Last month saw no fewer than six new full price titles released, with a seventh in the pipeline. The new titles were:

- Double Dragon
- Dino Olympics
- Power Factor
- Lemmings
- Gordo 106
- Jimmy Connors' Tennis.

Desert Strike is expected before the end of this month. Atari remain firmly convinced that the Lynx will experience a revival once the Jaguar becomes available in decent numbers.

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 **STA37**, then your subscription has expired with this issue; if the information line reads "Complimentary Copy" 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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Advertising

There is a limited amount of space for commercial advertising in each issue of *ST Applications*. Contact Nicky Wilson on 0602-455250 for further details and to request a media-pack. Subscribers can place free classified advertisements - see page 57 for details.

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Subscription and Order form will be found on page 57.

Overseas Distribution

Distribution overseas is dealt with via our agents:

Worldwide Magazines, Unit 19, Chelmsley Wood Ind. Est., Waterloo Avenue, Chelmsley Wood, Birmingham B37 8QD. Tel: 021 788 3112; Fax: 021 788 1272.

Canadian office: Tel: 519 539 0200; Fax: 519 539 9725.

Contact us for details of your nearest *ST Applications* stockist.

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.39, will be dispatched a week or so after issue 38 is sent out.

Best Buys

Best Electronics attended their third UK computer show of 1993 in November. As usual, they brought across a myriad of peripherals and spare parts for everything Atari. They have recently returned from their annual buying trip to Taiwan and are in the process of tying up deals on Atari spares. They are also bidding for over 1000 palettes of 8-bit software, 8-bit Ataris and complete ST's, following on from a clearance of one of Atari's warehouses. Some of the newest additions to their catalogue include the 68882 maths co-processor for the Falcon, a low-priced trackball, RLL hard drive controller cards, a new monitor switch box and a plug-in RAM upgrade board for the Falcon. If you need spare parts for your Atari and can't get them locally, the chances are that Best Electronics will have what you need. Contact Best Electronics, 2021 The Alameda, Suite 290, San José, California 95126, USA; Tel: 408 243 6950 (Mon-Fri 1pm-5pm, approx 8 hours behind the UK); Fax: 408 243 8274.

Games Industry Adopts Self-Regulation

The European Leisure Software Publishers Association (ELSPA) is to adopt a voluntary code of practice in relation to computer games. It comes about as the result of ELSPA's recent association with the Video Standards Council and will result in computer games produced by ELSPA members carrying an age classification. The software will be classified as being suitable for up to 10 year olds, 10-14 year olds, 15-17 year olds and over 18's. The new scheme will come into force on 1st May 1994. ELSPA felt that classification was necessary because of the growing realism now possible in computer games and the emergence of CD-ROM, where entire films can be stored on a single CD. It is quite possible that some of the software currently available is in breach of the Video Recordings Act of 1984, and membership of the Video Standards Council, along with self regulation, should help prevent members from 'innocently' falling foul of the law. It has also been done to help stave off calls for legislative control of the industry. Self regulation in the video film industry, in the form of the Video Standards Council, has been successful and avoided the need for further legislation. Maybe the same approach will work for the computer games industry.

All Formats Roundup

The All Formats Computer Fairs have notched up over 100 events in the past four years. They continue to go from strength to strength with the first seven events of 1994 already having been announced. All fairs run from 10am to 4pm and admission costs £4 for adults and £2 for children. The line-up is as follows:

15th January ..... *Haydock Park Racecourse (J23, M6)*

16th January ..... *Brunel Centre, Temple Meads, Bristol (M32)*

22nd January ..... *Northumbria Centre, Washington, (12, A194M)*

23rd January ..... *National Motorcycle Museum, Birmingham, (J6, M42)*

29th January ..... *Brentwood Centre, off A12 (J28, M25)*

9th April ..... *University Union, Park Place, Cardiff*

17th April ..... *Ulster Hall, Bedford Street, Belfast*

News In Brief

Atari Users of Norway

Atari stalwart Steine Arne Jensen has recently formed a user group for Norwegian Atari Users. They support the ST, TT and Falcon and have a collection of over 2,000 disks of PD and Shareware. A newsletter will be produced on a bi-monthly basis and telephone support is available to members from 9.00 to 14.30 daily. For further details contact Steine Arne Jensen, Atari Users of Norway, 3630 Rødberg, Norway; Tel: 32741473; Fax: 32741700.

Gajits Changes Name

Gajits Music Software, the name behind such releases as Breakthru, Sequencer One and Sequencer One Plus, have changed their name to Software Technology Limited. The company have been trading under the new name for some time overseas and the move is designed to avoid confusion. Software Technology Ltd are at 40 Princess Street, Manchester M1 6DE; Tel: 061 236 2515.

ST Action R.I.P.

As expected, ST Action has been dropped by the Europress Group. After just one month as a mini-mag given away free with Atari ST User, the publication has been axed completely. However, the name will live on as it is to be used for the 22 page games section within ST User. ST Action's circulation had been dropping for some time, being too low to qualify for an ABC (Audit Bureau of Circulation) rating for about a year.

Prestigious Star?

Star Micronics recently announced an extended warranty scheme for its entire range of printers. It is known as Prestige Cover and will cost between £80 and £150 depending on printer type. Star currently offer an on-site warranty at no charge during the statutory twelve-month guarantee period. The new scheme allows you to extend it to three years in total. What makes this offer different from most extended guarantees is that you can opt to take it at any time prior to the expiry of your normal one year guarantee. Existing owners of Star printers can also take advantage of the scheme if their printer is still within its warranty period.

Contact:
Star Micronics UK Ltd,
Star House,
Peregrine Business Park,
Gomm Road,
High Wycombe,
Bucks. HP13 7DL;
Tel:(0494) 471111;
Fax:(0494) 473333.

Imagecopy 2 Upgrade

Imagecpy 2 has been upgraded to v 2.03. The new version fixes the direct print problem with the Falcon and also contains a 'CMY + K separation option which gives CMYK output from DeskJet 500C printers, i.e. the same quality as 550C printers.

Anyone wishing to upgrade from version 2 should return the original disk to the ST Club (see new address below) along with a cheque or postal order for £2.50.

ST Club on the Move

The ST Club office is now at:

7 Musters Road
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Nottingham NG2 7PP

Telephone: 0602 455250; Fax: 0602 455305.

Subscriber Specials

Warp 9

Save £7.00

Super-fast screen accelerator plus multi-function configuration accessory. Plus, free, the brilliant Extend-O-Save modular screen saver pack. Subscriber Special: £22.95

UIS III

Save £10.00

Buy this regularly applauded feature-rich Item Selector replacement for just £4.95 RRP: £14.95 Fabulous array of features - see our advert on page 56.

3.5" Drive Cleaning Kit - £1.25
6mm blue Mouse Mats - £1.25

Subscriber Benefits include:

* Exclusive opportunities to make huge savings on software, accessories and hardware
* PD and Shareware disks at 20% discount, from just £1 per disk
* 12 copies of ST Applications, the best Atari magazine anywhere
* Guaranteed delivery to your door every month
* PLUS, you save £6.00 on the cover price of ST Applications

ST Club Catalogue

Copies of issue 14 of the ST Club Catalogue will be mailed to subscribers over the last three weeks of December. We now carry four ranges of PD and Shareware disks and the new prices will take effect from January 1st 1994.

New PD and Shareware Disks

Premier Disks (AB.123 - £1.25 ea.)

These disks contain the best and most popular titles that we have. For maximum value for money many of the files on these disks are compressed. Uncompressing the files is simple - we use the same methods as some magazine cover-disks and our Disk Mags.

Premier Disks have disk codes made up with two letters followed by three digits (AB.123). Because copies of these disks are kept in stock your order will sent out on the same day that we get your order, and these disks cost just £1.25 each. (£1 each to ST Applications subscribers.)

Standard Disks (ABC.123 - £2.75 ea.)

The full range of disks from our catalogues and updates up to v13 are now designated Standard Disks. The disk codes for these disks are made up with three letters followed by two or three digits (ABC.123). Because these disks are now copied to order you need to allow up to five working days for us to send out your order, and these disks now cost £2.75 each (£2.00 to ST Applications subscribers).

Licenseware Disks (LCW.123 - £2.75 ea.)

These disks are semi-commercial products (see 'What is PD Software' box in our catalogue) and we pay royalties to the authors of the programs on these disks. Licenseware disks have the disk code prefixes GBU, GBD, BPR, and LCW. These disks cost £2.75 each and are they are kept in stock so that we can offer a same-day despatch on orders for them.

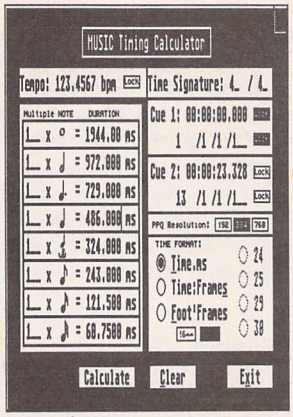
ST Computer Disks (STC - £2.75 ea.)

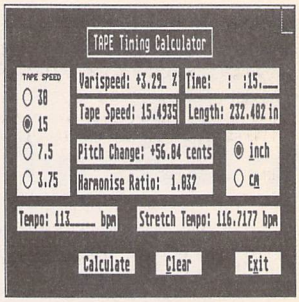
These disks are compiled by the German Atari magazine ST Computer. They have the disk code prefixes STC and are copied to order for a 5-day delivery on your order. Disks cost £2.75 each (£2 each to ST Applications subscribers.)

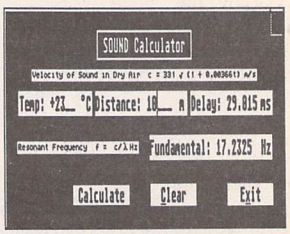
Catalogues

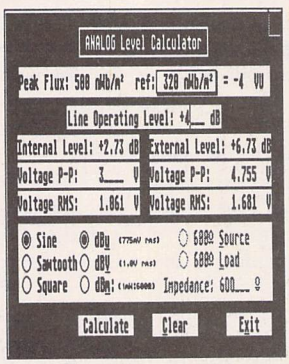
Version 14 of our catalogue describes all of the disks in our Premier range and the more popular disks in the Licenseware range. The disks in our Standard, Licenseware and ST Computer ranges are described in two disk based catalogues - see order form for details.

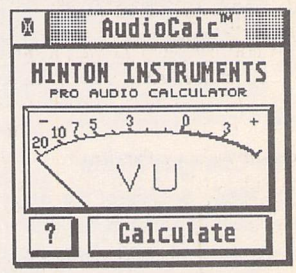
Audio Calculator For ST

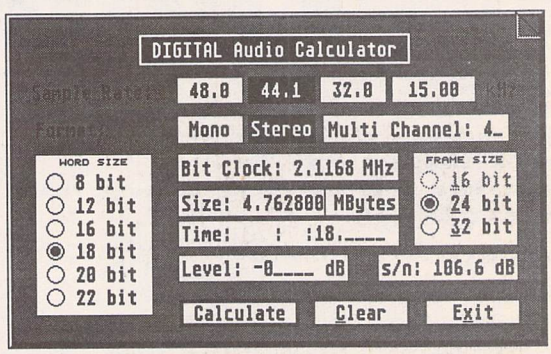












AudioCalc is a professional audio calculator for the ST, TT and Falcon. It requires a minimum resolution of 640x400 and has been developed to provide the most useful day-to-day utilities required in an audio engineering environment. It is intended to be used alongside a sequencer, audio editing or multi-media application. AudioCalc comprises five calculators, each catering for different needs within the professional audio engineering market.

The Sound Calculator computes propagation delay, distance and fundamental frequency of sound in free air v temperature. The Tape Calculator deals with varispeed, play time, tape length, pitch change and harmonise ratios. The Music Calculator handles tempo, multiple notes, time signature, bar length, time and offset v time and timecode or feet/frames. The Analog Calculator performs decibel conversions for peak to peak and rms levels v waveform, operating level and impedence and tape flux reference calculations. Finally, the Digital Calculator computes storage size and snr v sample rate, format, word size and time.

AudioCalc is GEM based and runs as an ACC, so it can be used within your own sequencing or sampling application. All five calculators are integrated into a single program. AudioCalc is an integral part of the forthcoming A440 Audio Engineering Toolkit for the Falcon but has been made available as a standalone product for all Atari owners due to a distinct lack of similarly specified products. AudioCalc costs £39.95 (UK), £45.00 (Europe) and £50 for the rest of the world. All prices include VAT & P&P.

Contact:

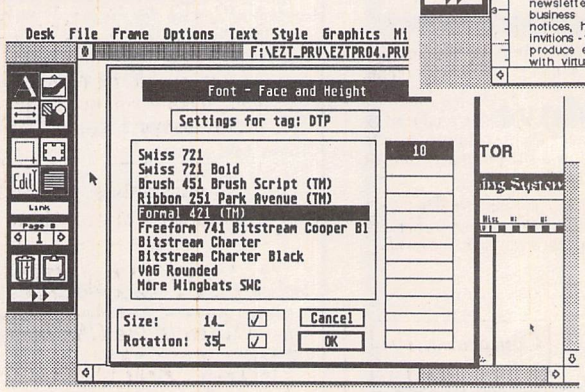
Hinton Instruments,
Oldford,
Frome,
Somerset BA11 2NN;
Tel: (0373) 451927;
Fax: (0373) 830679.

Easy Text Pro Vector

A new version of ***Easy Text Professional*** has been released which takes advantage of SpeedoGDOS. It is called Easy Text Professional Vector and costs £39.95. It is very similar to Easy Text Professional and even uses the Easy Text Pro User Guide. SpeedoGDOS allows you to use text at any point size and rotate it through any angle. The new version also allows the page to be viewed at five levels of magnification. Easy Text Professional Vector runs on any ST or Falcon and requires one double sided disk drive and at least two Megabytes of memory and a hard drive. If you don't have a hard drive, you'll need at least 2.5 Megabytes of memory and a ramdisk instead.

Existing users of Easy Text Professional can upgrade by returning their master disks along with the upgrade fee of £10. Existing users of Easy Text Plus can upgrade by returning their master disks along with an upgrade fee of £25. Please note that Easy Text Professional Vector requires SpeedoGDOS, which must be purchased separately.

Contact:
zzSoft, 114 Sparth Road, Clayton Le Moors, Lancs. BB5 5QD;
Tel:/Fax: 0254 386192.



SpeedoGDOS outline fonts in operation in the new version of Easy Text Professional - "ETP Vector".

Pre-Xmas Release for Jaguar

Piper

As you read this, the Jaguar will be out on the streets. Well, some streets. Oxford Street would be a good place to try, particularly the Virgin Mega Store, since Virgin is one of the software producers who will be scribbling away furiously to get some games out for the new format, along with other major houses such as US Gold, Ubi Soft, MicroProse, Gremlin, Accolade... the list goes on. And if the Virgin store has run out, you could always go down-market and nip into Harrods. Harrods!?? Yep. Apparently, they'll be showing some pre-Christmas stock as well, a rather neat bit of marketing. And there are even rumours of trying to pump a few through to the independent computer stores, though how they'll manage to do that with just 10-20,000 units available for the whole of Europe is a Gordian Knot I prefer to leave firmly tangled.

Stocks will be limited at first since the machine was not originally going to appear in Europe until next year, with all the initial push going into a launch on the East and West coast states in the US, but with so much interest and the possibility of 'grey' imports, it was decided to bring everything forward so we can at least get a taster. By Easter, stock should be at reasonable levels.

As for software, there will only be about four titles at release (software houses have a bit of catching up to do to get out the 41 titles they'd expected to release next spring), and it's expected that at first these will all be on cartridge rather than CD. The obvious reason for this is that the CD add-on isn't expected in Europe until March, though it will be launched at CES in Las Vegas in January. There's also the rather less obvious reason that Atari is claiming a 10:1 compression ratio, allowing 320Mb of software on its cartridges, just half of what can be thrown on a CD. At present it claims that few CD titles even get as high as 100Mb, so the advantages of huge amounts of data won't be there until the software has advanced significantly. When it does arrive, the CD add-on is expected to be around £100, a lot lower than originally anticipated. Shortly after that, cartridges will be available that will allow you to watch Video CDs using standard compression routines, either MPEG (like the CD-i) or MPEG2 (which allows rather higher standards of picture and greater lengths of film). Cartridge prices, meanwhile, should be around the £39.99 mark, though £49 and £59 ranges are anticipated.

This time Atari seem to be taking things seriously. And not just them. Other people seem to be joining in. Not only is there a growing list of software houses signing up, but the markets seem to think that Atari shares are about to metamorphose into gold bullion, with prices going from $0.75 to $12 (although the recent market denting brought it down to only $10.75).

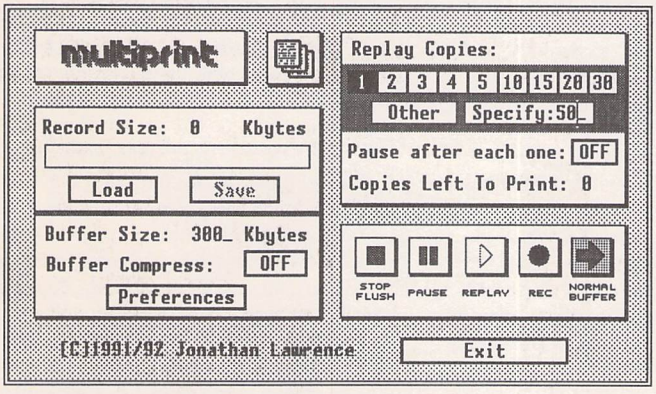
The marketing has already got under way in the US, with an impressive sounding TV ad which apparently takes a swipe at the current console market with "Nintendo is history and Sega is pre-history". The ad is split into two parts, the first warning that all children should be shuffled out of the room as there's going to be an announcement about something wildly new in the console department, and the second half actually showing the machine, until the whole screen is eaten by a cartoon Jaguar, which then gives a small belch whilst looking incredibly pleased with itself. I hope this will be imported to Europe.

So why is all this of any importance to people who read ST Applications, serious, dedicated people who want to get some work out of their investment, not play games all day?

Part of the launch consisted of official words on the future expansion of the Jaguar, not just with news of the growth of the console in speed and power, with a scheduled Jaguar II already being planned for 1996, but also the way in which the technology can be adapted to produce a home computer with the same graphical and sonic possibilities. We could be getting a new computer out of this.

We also get the advantage that, if it works, the Atari name will be as well known as Sega and Nintendo, so other members of the Atari 'family' will benefit from association. The sort of figures Atari are throwing around are of selling around a million units in the next year, with no real competition coming in until 1995. At last, some good news.

Multiprint



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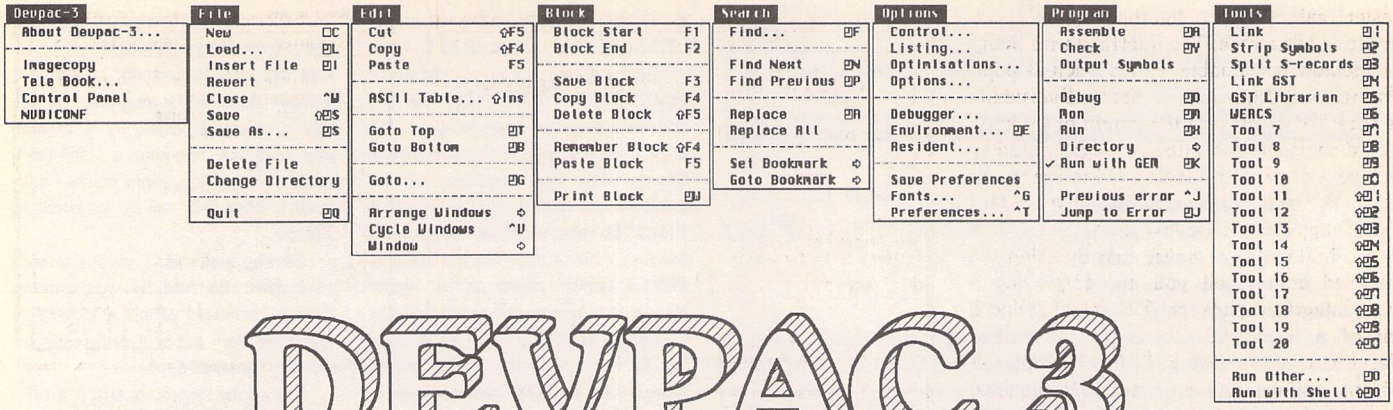


DEVPAC 3

Graeme Rutt

Introduction

When I was a child I programmed in BASIC, when I turned adult I programmed in assembler. I mean nothing deeper here than to state facts, and this is the chronology of my programming life. That's not to say that there is not a tenuous metaphor in that first sentence. The versions of BASIC I used were certainly on the childish side – ZX81 and Dragon – and the first ST BASIC was even worse. They were enough to put anyone off of high level languages for life.

Though I knew nothing about anything I did have one urge within me: I wanted to write the fastest games in the world. Although that never quite happened, at least I made a good choice of programs, the first incarnation of Devpac – when was that, seven years back? That was a long time ago. Now I'm a proper programmer – I know about GEM, so that proves it. Proper programmers need proper tools and, like me, Devpac has come a long way. Version 3 became available some months back. I bought a copy and have been using it productively ever since. Here, for what it's worth, is a proper programmer's view of Hisoft's premier – in my eyes – package.

The Package

Devpac comes on a double-sided disk, engulfed in Hisoft's standard sized disk-wallet, with the handy 680xx reference book and a 350-page manual. As with most professional software there is no copy-protection and the disk comes with an intelligent installation program to make things easier.

Intelligent? Well, it works out your system capabilities and then decides which parts of the Devpac package to install on your floppy or harddisk. You can ignore the installation entirely, if you will, by just copying everything to whatever folder you want to run Devpac on.

The Programs

Overview

There are three main programs to Devpac; the editor/shell, the assembler and the debugger. Unlike version 2, the assembler and debugger only come as TOS Takes Parameters programs. This allows programmers either to use the shell provided or to use a preferred shell/batch command system. It also means that the editor/shell provided has to load both.

This is a change from version 2 which included the assembler in the editor/shell but also provided a .TTP assembler for those who required it. V3 is better for all involved. Hisoft don't have to produce two program files, people who use their own preferred shell can be sure that they have the same assembler as everyone else and people with memory problems needn't have the assembler resident all of the time.

If this modular approach to Devpac's design worries you – maybe because you are working from floppies or a slow hard disk – then it needn't. All of the programs can be made memory resident if required, which, if you have enough memory, will alleviate speed problems. I like this design, even though I use the supplied editor/shell and had no difficulties in using the scheme employed in version 2.

Editor/Shell

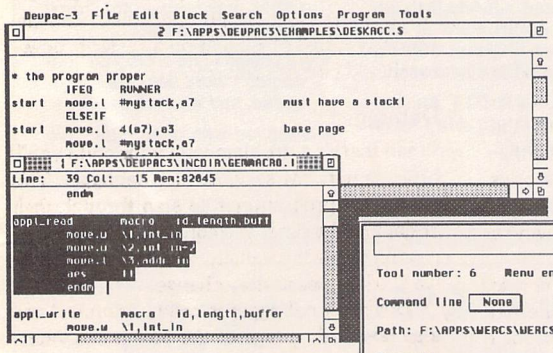
One of the most important new features in version 3 is the new editor. Actually, it won't seem new to those of you used to either Lattice C or Hisoft Basic – it's the same editor – but to those of us who've had to put up with the awful single window editor in Devpac 2 it's a real boon.

So, what do you get? Well, firstly, multi-window editing. Up to ten files can be in memory simultaneously and blocks of text can be transferred between them. Devpac still doesn't use the Atari clipboard, which is a shame, but all other usual cut/copy/paste features are there. Switching between windows is simple, just hit 'alt+window number'.

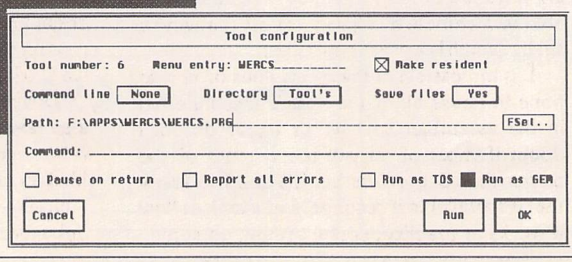
The editor itself is very quick – even on an 8Mhz machine – and does what it should; it edits text without causing the programmer many problems. The editing of text in a window is very similar to that of its predecessor, and most keyboard shortcuts have been retained.

It is now possible to set 'bookmarks' in your text, nine positions to be set over the ten windows. Setting and moving to bookmarks is achieved by either a keyboard combination or by accessing the 'Search' menu. Unfortunately, bookmarks cannot be saved into source code, thus limiting the effectiveness of the bookmarks to the length of a single session.

There are many other improved features in the editor, such as a choice of font sizes, a



◁ Editing text is easy with ten windows: here a block of text has been selected with the mouse, ready to be cut, pasted, or deleted for ever.



▷ Here's my tools entry for WERCS; note the many ways that a tool program may be run.

faster search/replace algorithm and a much improved interface. The interface uses many of the now fashionable 'extras' such as pop-up menus and hierachical menus. Everything is accessed easily with the mouse or by keyboard shortcuts and although slightly clumsy in places it looks and feels good to use. All in all, it is much better than the now ancient editor supplied with Devpac 2.

It's important to realise that by using the supplied editor/shell you are employing a truly integrated package. This might sound a bit of a 'buzz-word' but it really does describe the system to a 'T'. For example, all of the options that an assembler requires, normally included in the source code text as 'OPT' directives, can be controlled from the graphical interface of the shell.

But it goes much further than this. As well as covering all of the options in the assembler, it is possible to control the workings of the debugger, check on memory usage, create and include pre-assembled macro files and generally do anything from the shell that you could from a command line. This is great news for those of us who prefer graphic interfaces.

There are also other important features which the integrated approach gives the programmer. For instance not only can the assembler and debugger be made memory resident but also any program you choose to put in the 'Tools' menu; the programmer has great control as to how the program is run. You can choose the type of program, TOS, TTP or GEM, give it a set command line and also prompt for one. My only regret is that there is no facility in the command line prompt to use the file-selector to choose either a path or a file name.

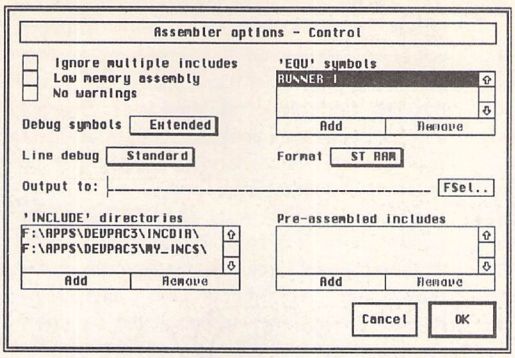
With the multi-window design the jump-to-error feature is much improved. If there is an error at assembly time the editor will jump to the first error that is in a loaded source file. Hitting Alt-J again will take you to the next, even if it lies in a different loaded source file. This is program integration at work and is a very powerful feature.

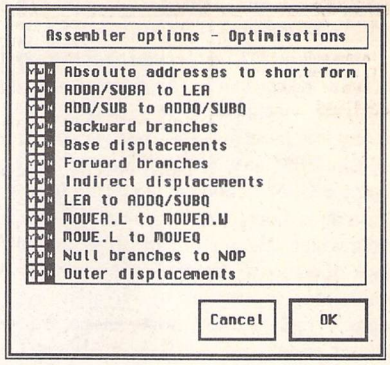
If you haven't guessed yet, the Hisoft editor/shell gets a big thumbs up from me. Editing text is quick and easy, selecting options is a joy and the integration is a big plus to the busy programmer. Reservations? Few, although I would like to see an amodal interface with all dialog boxes in windows.

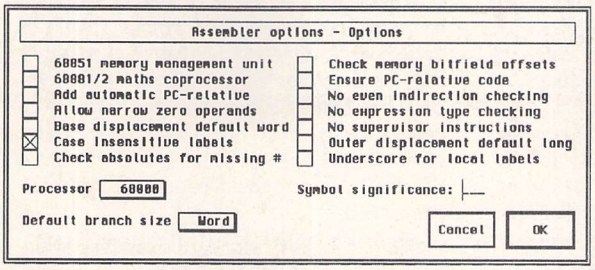
Assembler

However good the editor/shell is, an assembler flies or dies on the power of its assembly process - the way that a source file is turned into executable or linkable code. In Devpac this comes in the form of a program called 'gen.ttp' which is run from either the supplied shell or any other CLI you choose to use. It is very quick, fully featured and has a high specification. The assembler, unlike the editor, always was good - even in Devpac 1 - but now it's even better.

The wealth of options open to the programmer is quite staggering and may be roughly split into two camps; those that change the way the entire file is assembled and those which change the way different lines of code are assembled. The former options are controlled by switches in the shell or by 'OPT' directives in the source and the latter by macros, conditional assembly and several other directives.







Above left: The main assembly control page; from here most assembly time options are controlled.

Left: Some more assembly options; this page is mainly concerned with the way that assembly takes place, checking for errors, etc.

Above right: Yet more assembly options; this time giving a great depth of control over program optimisation - they work well in practice, giving faster, more compact code.

Taking the initial options first, code may be created in a number of ways; for a specific processor in the 68xxx family, in a specific format (executable, linkable, to memory), using a floating point chip or even in a format suitable to be blown into an EPROM. Assembling to memory is exceptionally useful for debugging purposes, creating an already loaded program in memory to be accessed by a single key-click from the shell. And the three linkable formats (Lattice, DRI and GST) cover just about everything a programmer will ever need.

In the latter group we find macros, conditional assembly - including chunks of data (either more source code or binary files) - and repeat loops for repeating lines of code.

Macros are used to implement often used routines in a human readable, shorter form and conditional assembly controls which lines of code are to be assembled. They are mentioned together because one often complements the other. It would be possible, for instance, to write a macro which could add together 2, 3 or 4 numbers. Conditional assembly would be used to create 1, 2 or 3 'add' commands depending on how many parameters were passed to the macro.

Conditional assembly is also used alone. A very common use - and one included in one of Devpac's example sources - is to allow the programmer to assemble source files as either desk accessories or programs. Accessories are notoriously hard to debug 'live' and being able to assemble as a program by changing a single switch is a great time saver.

It is impossible in these few lines of text to hope to cover all of the possibilities inherent in the assembler so I won't try to do so. I doubt if most of us will use a tenth of the power that Gen offers but it's good to know that it's available if required. Let's look at how it works in practice, concentrating on something very important - speed.

Gen is a very quick assembler, although there is little to compare it with in the Atari world; it's certainly fast enough to cause the programmer no difficulties. There are also some additional features which can speed up the assembly process even further. Hisoft quote an implausibly high figure for assembly time, which is probably quite accurate if assembling a million or so NOP operands. However, even in a real life situation it is still surprisingly quick.

As an example I've used a medium sized source file - 1700 lines - which also includes Devpac's entire GEM macros library. With Devpac 2 this takes 9.4 seconds to assemble, taking 9.1 on subsequent passes after the include files have been stashed in available memory. With Devpac 3 these times are 8.6 and 8.5 seconds, respectively.

If this isn't enough then it's possible to pre-assemble include files to speed it up even more. I found that pre-assembling the 'gem-macro' file brought the speed down to 8.1 seconds. Real motorheads can get assembly time down to 7.7 seconds by loading the two GEM library files (aeslib and vdilib) into the editor. Not bad at all, and on a faster processor they'd be even better.

Debugger

When there's a problem with your code you'll often require the services of a debugger. This allows the programmer to step through their code line by line, if required, whilst interrogating register values, memory and hardware addresses as they change.

Devpac's debugger is called 'mon.ttp' and also takes advantage of the now much vaunted integration. If a program has been assembled as an executable with a single keystroke - alt-D - you will automatically be sent to the debugger and the program counter will be set

to the first line of your program. Another good reason to use the editor/shell!

Mon is a TOS program: there is no GEM interface and this is for a good reason; the intricate workings of a debugger, with its many low level system traps, would be difficult in GEM and debugging a GEM program from a GEM debugger would be impossible. Mon does, however, have a very usable interface which doesn't suffer too much from the lack of a mouse. Up to 5 'windows' are used, containing a number of different types of data - registers, memory, disassembly and source code.

Windows can be widened, split/merged and zoomed up to full screen size - this is all done in a fairly limited way. For instance, widening a window makes it a set, standard size. Windows may also be locked to any valid expression, a disassembly, source or memory window will always point to the address of the expression that it is locked to. This is used in the default set-up to lock the main disassembly window to the program counter. Windows may also be stacked on top of one another. Very useful if you need to keep track of several areas of memory at once.

As implied above, Mon contains a full expression evaluator, this can be used to find the value of an expression. You wish to know the value of a data register, plus four, divided by sixteen added to the contents of an address register? As they now (sadly) say in Burger King: you got it. Expressions may be used in any place that you would use a number; changing the address of a window, locking a window, setting a breakpoint or even just finding out the value for your own purposes.

This feature is made even better by the use of the ten memory registers which Mon gives the programmer. Let's assume that the programmer is using a technical data structure for an array of longwords. A0 is a pointer to the current record, the first longword in that record points to a string and the second points to the address of a routine. By locking the windows correctly, to {a0}, {m3} and {m3+4}, it is possible to watch, dynamically, the contents of your data structure as you single-step through your program proper.

Expressions may be freely used in breakpoints as well. These useful little blighters come in a variety of flavours. Simple, stop, count and permanent are pretty usual fare but the other type, conditional, is very special indeed. Each time this breakpoint is passed an expression is evaluated and if it's found to be true then execution is stopped.

Mon is packed with good features; it's possible to switch from the debugger screen to the program screen at any time, programs may be run in a number of ways whilst allowing the programmer to watch the debugger screen, programs may be run until an expression becomes true, memory may be searched for numbers, instructions or strings, chunks of data may be copied and any area of memory may be disassembled to either disk or printer. This last feature allows the programmer to generate local labels; you could, for instance, disassemble anyone's program out as a source file which could be changed and re-assembled.

Mon also comes as a TSR variant 'Amon' which will stay out of the way in memory until 'alt-shift-help' is keyed in or an error occurs. At this point you can use the debugger as normal, memory may be searched, registers may be interrogated and instructions may be single-stepped through. Obviously, there is no way of loading a new executable into Amon!

This is a complete debugging package which, personally, I couldn't live without. It allows programmers complete control over their program debugging needs and can hardly be faulted. There is maybe not quite enough control over the display but that's not too much of a problem.

Other Stuff

As well as the editor/shell, Gen and Mon, Devpac comes with an array of other programs and files. Probably the most significant of these is the linker, CLink. A linker takes object modules - an assembly option - and turns them into an executable program. Linkers are often used when working with two or more different languages, and being only an assembler programmer, apart from a short test or two for the purposes of this review, I've never used a linker.

CLink seems to have a wide range of options and features. Unfortunately, little of the integration that is so much a part of the main programs is available to the linker. In fact, from the editor/shell, the programmer is limited to defining the paths in which CLink should look for object files and passing a standard batch file to run. After that I'm afraid you have to use the oh-so-handy command line interface that constitutes CLink's front end.

As well as CLink, Devpac comes with a second linker, this time supporting GST format files. This is slower and less fully-featured than CLink but does allow the programmer to use Devpac along with other languages which only support this format. A definite advantage of using this linker is the librarian program - also CLI based - which helps the programmer to keep track of object files.

The Devpac disk also contains an S-record splitter - if a program needs burning into an EPROM it is often necessary to split the code into odd and even bytes and this is what SRSplit does. There is a program which strips symbols (labels) from executables, a TSR program to fix an OS bug, 'NOTRACE' another TSR which can stop crashes if using Amon and even a ramdisk. There's little in the way of executable's which is missing from the Devpac package - with the exception of 'WERCS', a resource construction set, which Lattice users will find bundled in with Lattice.

Now, on to the non-executable files - this is, unfortunately, a different story. There are three example programs and six 'include' files, three of which supply GEM macros and three of which are merely equates for GEMDOS, BIOS and XBIOS. This is very much on the lean side, I'd have liked to have seen a disk packed with examples and I'll have all the macros I can lay my hands on.

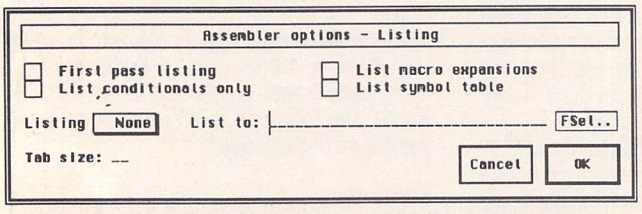
What there is is very good; the examples include a desk accessory shell - useful if only to show correct use of conditional assembly and macro calls - and a simple GEM program, which shows the rudiments of GEM window programming. The GEM macro files are really first rate, they cover all of the calls available to the programmer on the ST/TT platforms (see below for Falcon) and work very well in practice. So far I've only found one bug and Hisoft are currently sorting it out for future releases.

Documentation

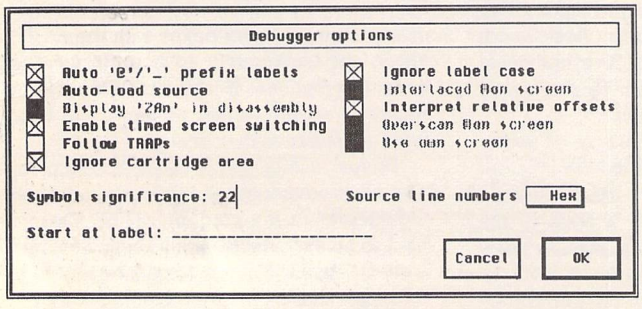
The documentation which covers all of the executable aspects of the package is very good. It explains the programs in depth, includes good descriptions of all the options, is written fluently and has plenty of reference sections showing keyboard shortcuts, etc. Maybe the reference sections should all be in one easy to find appendix, but this is hardly a difficulty.

There are a few machine specific sections, dealing with subjects as diverse as the TOS memory map, floating point chips and VT52 screen codes. The brevity of these pages is, though, nothing compared to the descriptions of the include files.

Following a useful few pages on optimising



◁ Assembler options again. This screen deals with the listing of the code that's produced - often useful for checking that macros and conditional assembly is working correctly.



◁ Debugger options: there's plenty here. Note the greyed out options - Mon can finally deal with non-standard screens!

your own OS bindings and program startup/termination there follows a list of most, pre-Falcon, OS calls. And it really is little more than a list, with very sparse descriptions for GEMDOS, BIOS and XBIOS and no descriptions at all for the GEM macros.

This is pathetic, and my misgivings maybe go a little deeper than this. I strongly believe that any programming package should come with details of all the machine resources that it opens up to the programmer. Hisoft BASIC comes with a manual which explains all the system calls, Lattice C comes with an extremely complete 'Atari Libraries' section, so why is there nothing similar for us Devpac programmers? I put that question to Hisoft and their answer, if not wholly satisfactory, was possibly logical. They believe that most programmers wouldn't be using Devpac alone, most would be using it as an adjunct to C. And in that case? Well, they'd have a full libraries book anyway. I'll leave you to make up your minds on the validity of that and go on to a much more pleasing aspect of Devpac.

Devpac 3.10 – the upgrade

In the last few days a copy of Devpac 3.10 landed on the mat. This is an important upgrade – it is .09 more, after all – and it now makes Devpac fully compatible with SpeedoGDOS, MTOS and the Falcon. This compatibility comes in two flavours, firstly the programs themselves are now compatible and secondly the macro and equate files have been updated to encompass all of the new OS calls.

I don't yet own a Falcon – or either SpeedoGDOS or MTOS – so I can't pass any comment on the effectiveness of any of these features, but they certainly exist. There are two new program files 'MON030' and 'GEN030' and the include files list all the calls that I could find in the new 'Atari Compendium'.

Again, my only criticism of the upgrade is the documentation – nothing but a single reference card. It details the few changes to the programs, mentions that the include calls have been changed and then reads like an advert for Hisoft's new book 'Modern System Software'.

Maybe I'm being a little unfair here, the upgrade does only cost a maximum of seven pounds but I'd have liked a list of the new calls if nothing else! One big plus is that it provides a keyboard shortcut reference section for the editor/shell and the debugger. Maybe they were peeking when I wrote about this somewhere above?

Conclusion

Devpac is an excellent package which gives assembler programmers everything they'll ever need – and a lot of things they'll never need but it's nice to have.

For the Atari assembler programmer this is good news indeed; if we didn't have Devpac what would we use? How many of us have the credentials or the money to get a Developers' Pack with access to the assembler in that? There are a few assemblers in the PD/shareware world but they aren't much to write home about.

I take my hat off to Hisoft for providing the Atari community with such excellent products. With Devpac 3 they have a splendid product, with good product documentation and only a small problem with O/S documentation. Well done. If only all software houses were like this!

Product:.....Devpac
Developer:.....Hisoft
Version:.....3.10
RRP:.....£79.95
Upgrades:
Standard.....£7.50
Silver Support...£5.00
Gold Support.....£3.00
Supplier:.....Hisoft
The Old School, Greenfield,
Bedford MK45 5DE England
Tel:.....0525 718181
Fax:.....0525 713716
Manifest:.....350-page manual, assembler reference booklet, double-sided disk.
System:.....Any Atari platform, up to and including the Falcon, any standard resolution, 1MB minimum memory recommended.

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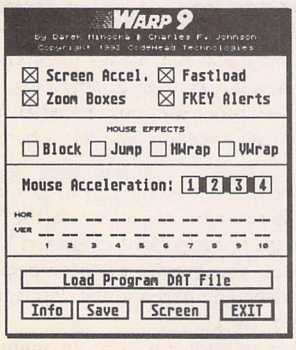
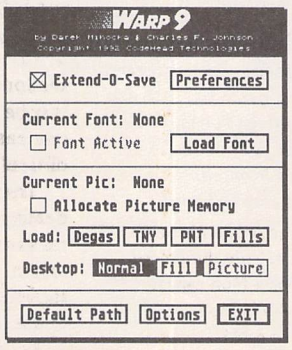
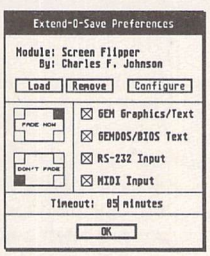
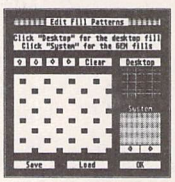
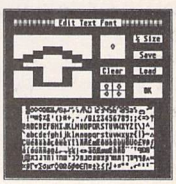
Compatible with 68000 and 68030 accelerator boards.
Installs custom screen fonts and desktop picture or patten.
Font and pattern editors included.
Built in mouse accelerator with mouse effects such as block, jump, and wrap, and a customizable mouse accelerator.
Compatible with Quick ST3 problem-programs like That's Write and Calligrapher.











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How is this possible? Most GEM programs display graphics and text by calling standard routines built in to TOS. Warp 9 intercepts and handles these calls with optimized assembly language code that is *much* faster than the built in routines. Graphics and text still look the same, but appear with astonishing speed!

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Price: £29.95
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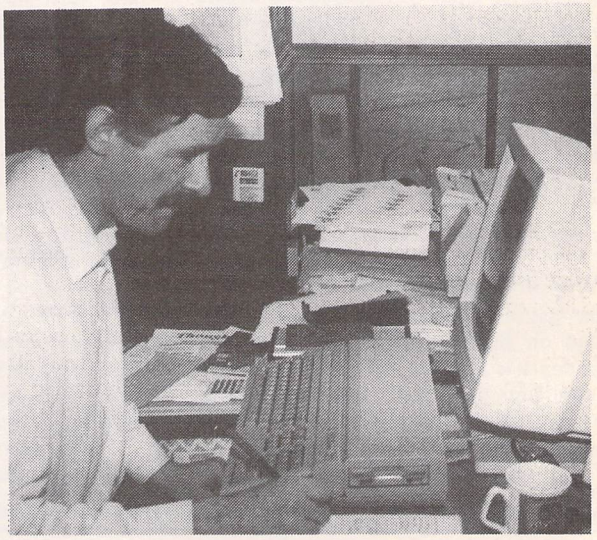
COMPANY PROFILE

Titan Designs

Titan appeared on the Atari scene a few years ago with their first product the Reflex graphics card, which allowed the user to increase dramatically the screen resolution of their monitor while maintaining compatibility with their software. Since then however they have moved on and now have an astonishing array of software and hardware that is set to appear in the very near future. Dave Howell talks to David Encil.



David Encil at his desk. The computer is a Falcon.

I began by asking David about his background before he began Titan.

"I'm an instrument technician by trade. My interest in computers really started when the BBC B's, Commodore and Atari machines began to appear in the UK. My primary interest was in the graphics side. I have always been fascinated by the graphical capability of computers. When I looked at the BBC B and the Atari 400 at the time, it was really an obvious choice to go for the Atari because of its graphic capability. That is really how I became involved with the Atari range.

"From there I did a little bit of programming myself on the 400 purely for my own interest, normally graphic based, but I also did a few databases. Later I upgraded it to an XL - that was about 1984. I have still got my first ST. I had one of the very first that were shipped over in '85 or early '86.

"I also started a shop called Magnetic Media with a friend of mine. We were selling blank video and audio tape. We also sold floppy disks of all types. We even brought in a load of 8 inch disks which was a big mistake as we never sold one. We had a hundred when we started and a hundred when we finished. We even tried giving them away to use as frisbys but nobody wanted them. We were also getting quite a few enquiries about Atari computers. In those days the STFM had just arrived. People were asking us if we could get them one. We made some enquiries and began to sell them.

"We then got involved with a couple of other guys who were into hardware design. We formed a company called Elmtech Research which was set up to produce the Parsec graphic interface. The project turned out to be a failure as the two people that had come on board to do the design work didn't do the work at all. We did sell a few of the boards but not enough, and so Elmtech came to an end."

I wondered if he thought the Parsec board was too much ahead of its time.

"Yes, quite possibly. It was selling for £799 then. It was too expensive for the market. It would have sold in limited numbers though. It was capable of 640x480 and 1024x768 with 16 colours. There was then going to be a memory expansion board which would have given the same resolution but in 256 colours. It had a dedicated graphic system processor on board which made it extremely powerful and blinding fast, running at 50Mhz.

"It was decided to wind up Elmtech because of the problems with the two technical guys. It took so much of my resources that we felt it wasn't really worth carrying on with. That was about 1989. About that time I met up with David Glasspoole. He was selling and is still selling a product called Music DTP (recently re-christened 'SharpScore').

"We both saw that there was a market for a high resolution graphic card for the Atari ST, which would support up to 1024x1024 pixels; and we also knew that we could produce it extremely cost effectively. So that was how Reflex was born. David did the hardware design. I did the PCB design as I had some experience being an instrument technician myself. We also got a friend of mine called Peter Armitage who is based in Germany to do the software from David's original design. It has sold very well. We are very pleased with the outcome.

"It proved to be a very successful design. We sold quite a few, exact numbers I can't tell you. In the middle of '92 David wanted to pursue Music DTP and other hardware projects which were not really in keeping with what I was doing. We decided that it would be better for me to buy him out. So that took place in the middle of last year and since then I have been the sole owner of Titan Designs.

"I knew about the Falcon well in advance of the announcement to the general public and immediately saw the possibility for video applications. In my opinion the Falcon lends itself beautifully to two areas: music and video graphics. It also offers a lot for existing ST programmes, but art and music are the two main areas where it will excel.

"From there I got in touch with a chap called Robert Thompson, who is involved with hardware design. He designed the Graffiti Genlock and is currently designing the Fresco Genlock and the Exposé digitiser for me. I also got in touch with a few software developers. Phil Monteith and Peter Armitage were still with us.

"The way we divide up the work now is that I make the tea and sign the cheques; Rob does the hardware design; Peter and Phil work on the ImPro software which supports Graffiti, Fresco and Exposé. Phil is designing the front end and Peter is doing the special effects. I also have a graphic designer who does a lot of work for me, Marc Woodhead. He has helped me with the title screens and the icons. So within the next few weeks we will be starting to ship Graffiti Genlocks, which will be the only new product we have had since the Reflex graphic card."

I asked David if he was surprised at how fast Titan had developed. It seems that after the Reflex card the company has moved on in leaps and bounds to the point where they have quite a few products in various stages of development.

"After designing the Reflex card in conjunction with David Glasspoole there really wasn't much going on. We were thinking of designing the Reflex card for the Mega STe but the market wasn't really big enough to support it."

I asked him why he thought

that the Reflex card was the success that it is.

"The secret, if you could call it the secret, is that we build cost effective products. We don't try to put a price to a product that we don't think is affordable. One thing that I have always done is only produce products that are cheaper than the base model of the computer itself.

"The Reflex card started life at £249 plus VAT which is cheaper than STFM's and STe's were at the time. Similarly, the Graffiti genlocks are only £149 which is still cheaper than the STFM is now."

Many of the best known UK Atari companies have a product range that has been brought into the UK from Germany or the USA. Their companies have in most cases been set-up to sell that product range.

Titan is different in that they are UK based and do not bring in software from abroad. All of their products are home grown. I asked David if this made him feel like a pioneer or if it left him feeling a little isolated, as I would be hard pushed to think of anyone else in the Atari market who is developing hardware peripherals for the Atari range.

"It isn't really a question of competition. Competition is always healthy, as it makes you develop your products better. It benefits the customer but not necessarily the company. It stops you becoming complacent."

I then asked what his thoughts were about the debate that has been going on about the Falcon being put in an ST case.

"I think that it is irrelevant and I'm not too averse to the STe-style case anyway. In my opinion the STe case looks very nice. I have no objections to it at all, although I would like a separate keyboard, but that is just for flexibility. I suppose the problem is that the STe-style case has been around for so long people have got used to it. They are therefore looking for something that looks a little bit better. The major problem has to be when you have fitted the up-grade to your machine and then there isn't enough room in the case to get the top back on. Fitting an Exposé digitiser into the Falcon is very easy as it uses the Falcon Bus."

I then asked if, as a hardware developer, he has any problems with the Atari's architecture. Does it make developing things like genlocks difficult from a hardware point of view?

"The system architecture does make it awkward for people to upgrade. It now lends itself to the hacker who will be cutting out chips, etc., and why didn't they put Simm boards in the Falcon?"

I asked David the question that I had asked all of the other interviewees in this series about Atari doing some very serious reorganisation prior to the launch of the Falcon, one person even going as far as to say they were almost in the same state as when they launched the original ST machine.

"I knew about the Falcon well in advance of the announcement to the general public and immediately saw the possibility for video applications. In my opinion the Falcon lends itself beautifully to two areas: music and video graphics."

All of the other people that I had talked to agreed that it was a revolutionary machine. I wondered what David's thoughts were as his company are the first hardware developers I had talked to. He could view the Falcon with the top off and see it for what it is. I asked if he thought it was such a leap in technology that we have been reading about.

"The Falcon should put Atari back on top as long as they market it enough. At the moment they haven't been showing that to satisfy me. I can appreciate why they have rationalised the company and centralised their operations. Alister Bodin has been a great help to me and I know that he is extremely over-worked at Atari. There might not be many companies that are developing serious products for the Falcon, but he could do with some help. So that is a black mark, and things like trying to get loan machines to test software, etc., is very hard when it shouldn't be.

"I'm pretty sure the reasons for reorganising the company were financial, which is a chicken and egg situation: you need to offer the support to people to develop products to interest the customer to buy the computer. If you cut down on the support developers will get frustrated; they can't get the help they require quickly which means products are late getting out, and the public is no longer interested in the machine.

"Going back to what you were originally saying about the Falcon being a revolutionary machine. Yes, it is. What they have done is tie together a lot of advanced technology into one computer, without the need to buy other cards or peripherals to get the same specification as you would have to do if you had a PC. So yes, it certainly has a place in the market and is well worth developing products for."

I then asked David if he had moved away from just selling a single product because he was finding that a lot of his customers were looking to him to provide the machines to run them on and the other peripherals that they would need.

"In my opinion the STe case looks very nice. I have no objections to it at all, although I would like a separate keyboard, but that is just for flexibility. I suppose the problem is that the STe-style case has been around for so long people have got used to it."

"Yes, that has been self-perpetuating really. The Reflex card was selling well enough but we were finding people saying that they wanted either a music or DTP solution, or a large screen for the Reflex card, so we began to sell those. We also found that customers of ours were coming back and asking us if we could suggest a good document processor for instance. So it made sense to offer a complete range of products from a mouse all the way up to a 21 inch monitor with Reflex card."

I then asked David about the profile of his users. Neal at Compo had said to me that the majority of his customers were existing users. They had had some experience with the machine and were looking to push it a little further. I wondered if that was the case with Titan's customers.

"I'm not a main line distributor myself apart from my own products of course. I don't advertise to a huge extent. As I offer a service I can't offer a huge discount. I do discount products to make them attractive to the user but I obviously can't compete with the box shifters.

"So effectively I don't get a large number of new users. But when I do I will normally get their business because I talk to people. I don't try and fob them off with something they don't really want."

I had asked most of the other companies I had interviewed about the stigma that is attached to the Atari range. Even after many years it is still viewed as a games machine. What were David's thoughts?

"It only got the games tag for a start-off because it was originally a very cost-effective computer which lent itself to the home environment. That of course does not necessarily mean that it is a games machine and that is all it is good for. The games machine tag has always been unfair. Less so for the Amiga, as the designers in 1984 were horrified when they learned that Commodore were in fact going to turn it into a computer: all it was originally going to be was a games console, and then Commodore tagged a keyboard on to it.

"This was unlike the ST that was built as a home computer. Instead of putting out machines that were better and better Atari have rested on their laurels a bit. Although the ST is still selling in some numbers it is extremely old hat now. They have lagged behind on the technology front but they have more than made up for it with the Falcon. In fact the only bad thing about it is the 16Mhz Bus and the 16Mhz processor."

Users will always get upset when their machines are referred to as simply good enough only for games. David Link made the point that perhaps we were being a little to tough on Atari. They are there to produce a computer that is cost effective for them to get a good return on their investment. It is not their mandate to promote the machine in every conceivable market area. This is up to the third party developers to decide if there are enough users out there who are looking for something else to do with their machines, to support whichever product it is they are thinking of bringing into the market. I asked David what he thought of that point.

"Yes, up to a point. However, having said that, that would be fine if they offered the support that is needed to the developers when they need it. I agree with a great deal of

what David said and it is the case that the companies' managing directors do need to see a market there but a lot is left to the companies to do a lot of the marketing of the computers themselves.

"For instance, why are Atari advertising the Falcon in the Atari magazines? Everyone knows about it. If anyone wants to know more they can pick up the phone and talk to me or HiSoft, or System Solutions or Compo.

"Atari should be advertising not only in the music industry magazines but also in the video magazines. I have already suggested to them that in the future maybe we could place joint adverts in the video magazines promoting both the Falcon and our own video products."

One of the major questions that I wanted to ask David about was the concept of 'multi media'. Some of us have an idea of what it actually means but the majority are still waiting for a definition. As Titan deal almost exclusively with image manipulation programmes and hardware that will lend itself to the concept of multi media, I asked him if he had a definition and had any thoughts as to how - if at all - the Atari range, especially the Falcon, would fit into that definition.

"My view is that it is the Jaguar that is going to bring multi media to the masses rather than the Falcon. I won't say that it will appeal to a wide spectrum of people but it will be cheaper and this will establish it in the market place.

"The Falcon could lend itself to multi media, and yes I could see it being used as a video phone using slow scan digitising technology in the future. But I do think that the Jaguar will lend itself more to multi media. Multi media seems to be going around in circles at the moment. No one really understands what it is. I think it is just the integration of video and sound.

"ImPro, for instance, is a fully modular programme. I'm not talking about a programme that can be up-dated but a complete programme shell that will accept any module as long as it follows our guidelines. Modules can be simple things like a single video effect such as scrolling the text on the screen diagonally across the screen instead of up or down for instance. Or it could be a complete programme in its own right running within the shell. This could be ray-tracing, or it could be sound. The obvious implications are that you can integrate graphics with digitised sound. This in itself could be construed as being a multi media application."

David had mentioned a number of the hardware and software packages that he will be releasing in the near future. I asked him if he could now go into a little more detail about what we will be seeing shortly from Titan.

"One product that we are currently developing which was initially intended for the Exposé digitiser is something called ImPro Capture. This is for capturing the incoming image from a video camera and digitising it into a file format such as TIFF. Not many as it is mainly for capturing the image which you can then use within DTP programmes or whatever.

"That is being designed by Lawrence Moroney. He originally contacted me for his work experience for his MSc thesis. I can't tell you which subject it is exactly but image processing does fit into it quite nicely. I was so impressed by the initial work that he has done on ImPro Capture that we have decided to sell this as a separate package with far more features. We are calling it Hyperion.

"It will include all the normal features such as paint brush, blocks and adjustable brush sizes. It will also have true image processing capability which will be of more interest to the scientific community than the average customer who would just want to touch up a picture.

"Also, Peter Armitage in Germany is working (in his spare time) on a programme called 'Thought!'. This has to be seen to be understood. It is an ideas processor. It is like laying down a flow diagram that will allow you to link files and programmes, which you can then execute from within Thought!. It is designed so that you can run everything from within the Thought! shell. Whatever you are planning, whether it's writing a book, writing a programme, designing a manual, Thought! will help you do it."

"One point that I would like to make is that all the products that we are designing are fully compatible with all ST's and the Falcon. The only exception is that the Genlocks will not work on the TT. We do not see that as a major problem although we have had one enquiry from Alaska already! Also, the only other product of ours that is machine specific is the Fesco Genlock. This is designed for the Falcon only, although it could be made to work on the ST but we don't really see the point."

I then asked David how the software he has in development has come as something of a departure for him, as Titan up to that point specialised in hardware products.

"Software is a new thing for me. I haven't developed software as such before. So Hyperion, Thought! and ImPro are the first three that we will be doing for the Atari market."

I asked if they were specifically written for him, and whether as a hardware based company he looked for programmes that would enhance his hardware products.

"It depends how you look at it. Thought! for example was developed independently by Peter Armitage for his own use. He needed an ideas processor so that he could put all his ideas on to paper or screen and then take out all of the errors that occur when you are programming. It was a project that he has since refined to make it a commercial package.

"We also realised right from the word go that software support was going to be needed for the hardware, and so we found people who could do it as in the case of Hyperion."

"My view is that it is the Jaguar that is going to bring multi-media to the masses rather than the Falcon. I won't say that it will appeal to a wide spectrum of people, but it will be cheaper and this will establish it in the market place."

The last question I asked David was how he saw Titan developing in the future. He has a great deal of hardware and software projects that are about to come onto the market.

"We will still be concentrating solely on the Atari platform as far as the development of hardware and software is concerned. Aside from Titan I am also getting involved with the production of a new game. It will be a departure from all other games manufacturers as it will be STe specific.

"It is still in its design stages but it should be out near Christmas. It is going to use every trick that you could possible think of for the STe and that includes things such as hardware scrolling, taking the top and bottom boards out, split screen, links, and this is all one game!

"The basic idea behind the game is simple: it is just one man against another or, if you have a number of machines linked together, a number of men against each other; or, of course, you can play against the computer.

"You also go around playing other little games like space invaders while you move through the maze gaining points to buy weapons. That is the basic game. The graphics are being produced by Marc Woodhead who has also done the screens for Graffiti and Fresco. As I say, this is an STe-specific game and will not run on the ST or Falcon because of the hardware tricks we will be employing.

"As far as the Atari market is going we will wait and see. We have several other ideas in the pipeline. We were thinking of a high resolution graphics card but that has been put on ice for the moment, but there are several other products we are looking at for the Falcon."

With that we finished the interview. Titan have carved a niche for themselves in the Atari market that no other company has exploited. They will be offering everything that you could possible want if you are interested in the video side of the Atari. They are also breaking away from exclusive hardware design and releasing software that is new and interesting.

David was cautious about the future, but offering the quality of service that he does, coupled with a new product range that is impressive, should secure Titan's future for a few years to come.

Titan Designs Ltd are:

David Encil - Owner/Manager.
David Glasspoole - Reflex card designer.
Peter Armitage - Software designer for the Reflex card and author of the Thought! ideas processor.
Robert Thompson - Designer Graffiti Genlock, Fresco Genlock, Exposé digitiser.
Phil Monteith - Designer ImPro software.
Marc Woodhead - Graphic designer: Title screen and icon design.
Lawrence Moroney - Designer ImPro Capture and Hyperion.

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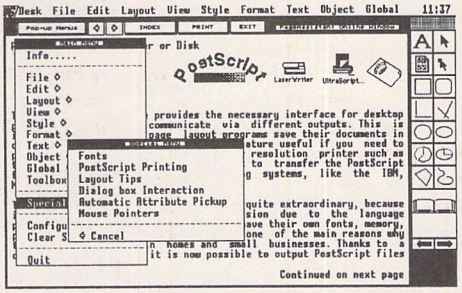

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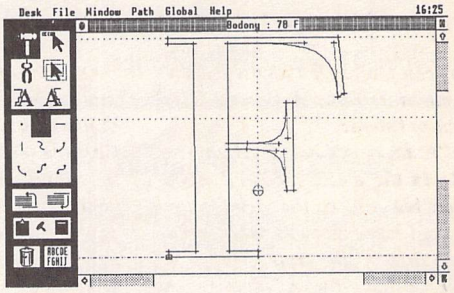
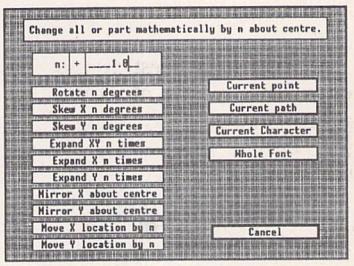
Fonty

Calamus Font Editor

This is a fully featured editing program for creating and editing Calamus CFN-format font files. Also, when used in conjunction with C-Font or Fontkit Plus, CFN files created with Fonty can be used to generate sets of bit-mapped fonts for use in packages such as: K-Spread4, Degas Elite, Timeworks DTP, Calligrapher, That's Write, Redacteur 3, and Wordflair.



Fonty features include: draw mode icons (Hammer mode, Pliers mode, Move mode, Select path mode, left and right kern mode), Grids and Guide Lines, Manual and Automatic kerning, Backgrounds for tracing (a Degas picture or a complete GEM font), a full feature Calculator to mathamatically manipulate fonts, and Window scaling. A separate program, PFB2CFN, reads a Postscript Type 1 Font file and copies it into a Calamus CFN font file.



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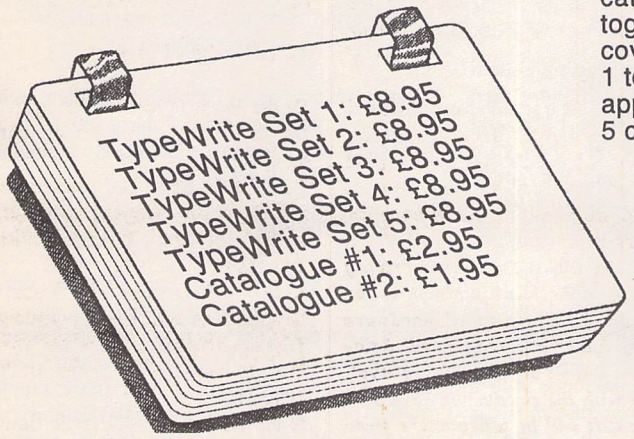
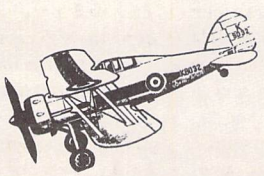
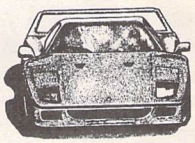
TypeWrite Clip Art

This is a series of high quality 300-dpi clip art professionally produced by the TypeWrite DTP bureau. Each set contains 100 IMG files on four double sided disks. The associated catalogues shows all of the images, printed full size, together with the file name and disk number. (Catalogue #1 covers sets 1 to 3, Catalogue #2 covers sets 4 and 5.) Sets 1 to 3 are general mixed subjects of use in most DTP applications. Set 4 is full of picture of dogs, and set number 5 contains pictures of planes and cars.







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A5 binder to hold clip art pages: £2.25

Timeworks Tips

David Smith answers a couple of questions that readers often ask about how certain effects are obtained in the layout of this magazine with the much-maligned Timeworks Publisher.

Vertical Justification

Whilst horizontal justification is perfectly simple to achieve with Timeworks, the process of getting text to line up neatly at the bottom of neighbouring columns is fraught with difficulties.

If you are only using one paragaph style - Body text, probably - and if you have no 'space above' defined in the Dimensions of that style, then there is no problem at all, so long as your columns have the same Vertical Position and the same Height. The problems begin when you want to separate your paragraphs with white space that is not equivalent to a line of text, and even more so if you are using more than one style: subheads, lists, etc.

In ST Applications I try to achieve some level of vertical justification, and I have developed two main methods of doing this. The first is useful when the body text paragraphs are separated by white space (where the paragraph style defines an amount of 'space above' that is not the same as the line height you are using); the second is better used when you are using first line indents instead of white space to separate your body text paragraphs, but are also using subheads, etc., of a different font size.

1) White space separation:

I make variations on the body text dimensions, called, for example, bodymore, bodyless, etc. This merely involves making the 'space above' measurements slightly different from those defined for body text. If the Body text style has, say, 0.08" of space above defined, then Bodyless will have 0.06" and Bodymore 0.10". Then, when the page(s) have been laid out, you can go to the bottom of each set of neighbouring text frames and adjust the levels of the last lines in each frame by changing the style of as many paragraphs as is necessary to get a reasonable finish. It is also possible, of course, to have more than one value for your subheads, or more than one Bullets value, etc.

2) First line indent:

The second method needs more planning. It is based on the idea of working in multiples of the line height you are using for your Body text paragraph style. By line height, I mean the sum of the point size of the font and its leading. Remember that Timeworks uses the term 'leading' to mean what I am calling line height! Thus, in the Dimensions dialogue box, if you have set a font size of eight with a 'Leading' of ten (often called eight over ten), then it is this 'Leading' value that you should use as your line height.

It is now a question of making sure that all your other paragraph styles (or at least all the ones that are going to be mixed in the same frames as your body text) use multiples of this value. If your line height is 12 (as in ten over twelve, for example), then you should be working in multiples of twelve. In all of the examples given below I have assumed a line height of ten, using an eight-point body text font with two points of leading (eight over ten).

Body text:	8 over 10, no space above
Subhead:	12 over 20, no space above

Care must be taken with this second method if you opted not to use 'space above' for subheads, etc. If a 10/20 subhead happens to fall at the top of a frame, there will still be white space above the subhead text, and your neighbouring top lines will be unlevel. You will need to define a second subhead leading value that is the same size as the font size, and then make a new body text style (bodyplus, for example) that makes up the difference between that and the line height multiple. Confused? Can't say I blame you. Here's an example:

Body text:	8 over 10, no space above
Subhead:	10 over 20, no space above
Subhead2:	10 over 10, no space above - use only at top of frame
Bodyplus:	8 over 10, with optional 10 points space above

And another:

Body text:	8 over 10, no space above
Subhead:	12 over 20, no space above
Subhead2:	12 over 12, no space above
Bodyplus:	8 over 10, with 8 points space above

When you need to use the 'Space above' item as part of your Dimensions definition, then make sure you set the Ruler to Picas and Points. If your line height is ten, then your subheads should have a combined space above and leading value of twenty or thirty; etc., etc.

Indent or not?

A small complication arises when you are using a first line indent to define the start of a new paragraph instead of white space. What do you do at the start of a section, or after a subhead, for example? I'm not sure if this is typographically 'sound', but I don't like an indent used after a subhead or at the start of a new column, and so I make an alternative paragraph style called something like 'bodyfirst' to use instead. Usually this is the same as the body text style, but minus the first line indent.

Remember that Publisher2 treats the 'Leading' value differently from Publisher1. In the latter, all of the Leading value is placed above the line of text, whereas in Publisher 2 around 80% of it goes above the line and 20% of it below. This means that the first body text paragraph after a subhead in Publisher2 will have a small amount of white space above it, but not in Publisher1, where any separation of subhead and following body text paragraph will have to be implemented with the 'space above' item:

Bodytext:	8 over 10, nsa
subhead:	10 over 12, 6pt space above
bodyfirst:	8 over 10, 2pt space above - use this after every subhead.

In Publisher2 this bodyfirst style will only need the first line indent removed, nothing else:

Bodytext:	8 over 10, first line indent 0.15", nsa
Subhead:	10 over 20, nsa
Bodyfirst:	8 over 10, no first line indent, nsa

The only snag here arises if you need to use a Subhead2 setting at the top of a column, 12 over 12 for example. The following paragraph will now have no white separation, and if you are happy with this then leave well alone. If not, make yet another style for this happenstance, called, perhaps, bodyfirstp (p for plus) and allocate the necessary amount of space above to make up the multiple line height value:

Body text:	8 over 10, first line indent
Subhead:	12 over 20
Bodyfirst:	8 over 10, no indent - use after subhead
Subhead2:	12 over 12 - use at top of column
Bodyfirstp:	8 over 10, 8pt space above - use after Subhead2

Thus, a subhead and a following bodyfirst style will give a multiple value of thirty (20 + 10); a subhead2 and a following bodyfirstp style will also give thirty: 12 + 10 + 8.

Moving columns

If you have, say, four columns to a page, and have moved the top of two adjacent ones down to make room for a heading or a picture, you will need to check that the bottom lines of these two frames still match the bottom lines of the other two. If not, it is a fairly simple matter of changing the Vertical Position for these frames until the bottom lines of all four frames are level.

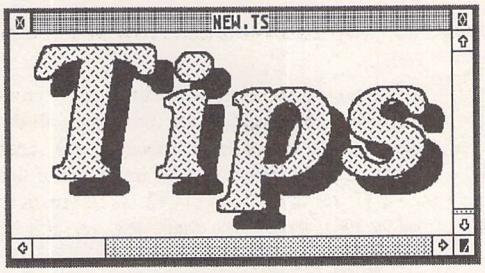
Large Headings

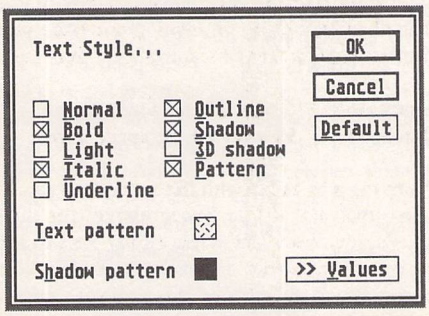
I am often asked how I manage to get such large point-size headings for the articles in ST Applications. The answer is simple: I cheat.

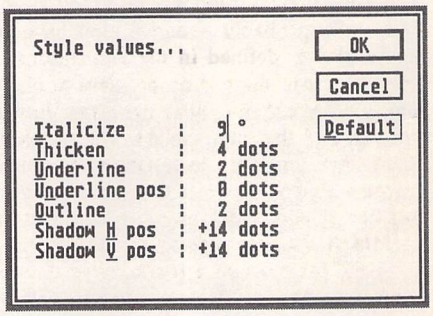
In the days of the ST Club Newsletter and the early copies of ST Applications I used the 'Show font' facility in Fontkit Plus along with a suitable screen-grabber; I then moved on to Fleet Street Publisher 3, exporting the relevant portion of a page as a 300dpi image file; next, mainly because I was already using it for the cover, I started using PageStream instead of FSP3, using a page size about 7"x1.8" and the IMG printer driver to export the page as a 300dpi image file again. All of these methods allow you to import the image into Publisher and then rescale it to your requirements. If you keep it around the same size as the original, there will be very little noticeable 'jaggieness' to spoil the effect.

And now there is Jeremy Hughes's 'Textstyle', an absolute boon. If you use a Calamus font (and there are lots in the public domain) and a large-ish point size, around 36 or 48, you can do exactly the same as with the sluggish PageStream, except you also have the option to add any combination of styles you want - shadowing, patterning, 3D effects, italics with definable slant, etc., etc. And with luck, later versions may include the ability to rotate, slant and curve the text in the same way you can with *TrueType* on the PC or with the *Flextext* pak in Calligrapher. A 48-point heading of a dozen letters or so, with shadowing and patterning, will create an IMG file of around 30K. By far the best (and cheapest!) way of adding decent-sized titles and logos to your Publisher documents.

An accessory version would be even better: you'd be able to use it from within Timeworks itself, on the fly, so to speak. Whether this will be possible, though, is the subject of investigation at the moment. Textstyle uses a fair bit of memory and Timeworks is not at all happy to relinquish any of its memory to greedy accessories. If this difficulty can be overcome, it will make the job that much easier and less time-consuming. But even if not, the ability to incorporate large headings will no longer depend on the 'overkill' solution of possessing other, more expensive desktop publishers such as PageStream.



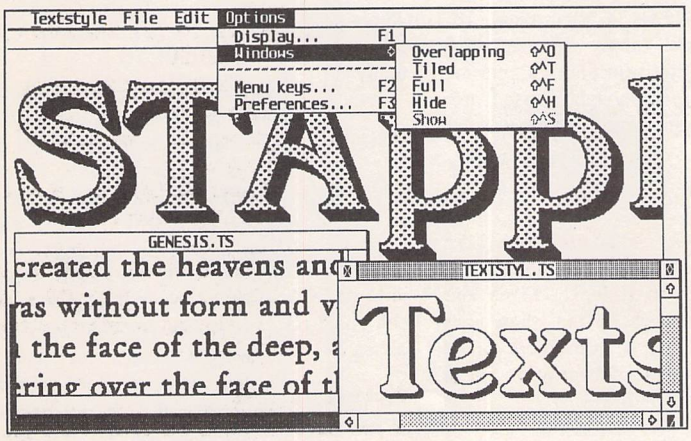




An example of how Text Styler allows you to change not only the Text Style but also the 'Style values' - the depth of shadow, the thickness of the outline, the amount of bold and the angle of the italics.

Textstyle

Text styler for Atari ST/TT/Falcon computers



- Create headlines and logos from GEM fonts or Calamus fonts.
- Import ASCII text containing up to 200 characters, or edit text within Textstyle.
- Text size and resolution can be adjusted freely.
- Font sizes can be selected in tenths of a point from 1.0 to 999.9 points (13 inches).
- Text styles include bold, light, italic, underline, outline, shadow, and pattern.
- Text styles can be configured to adjust bold increase, outline width, shadow offset, italic angle, text and shadow patterns etc. The angle of italicized text can be adjusted in 1-degree steps from 1 to 45 degrees (GEM skewing is fixed at 27 degrees). Patterns include 43 predefined patterns and 2 user-configurable halftone screens.
- Leading can be adjusted in 1-point sizes. Word and letter spacing can be adjusted in 1-pixel increments.
- Text can be left-aligned, centred, right-aligned, and justified.
- Styled text can be saved in Textstyle format (for reuse at a later date), or exported in IMG or TIFF format. Exported image files can be loaded into other programs or printed from Imagecopy.
- Advanced user interface including hierarchical menus, multi-key and user-configurable single-key shortcuts, pop-up menus, mouse-positioned alerts etc.

Launch price: £14.95
From 1/2/94: RRP £19.95
Written by Jeremy Hughes

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Colours Everywhere

As the computing world matures so colour is becoming more important - PC users are now accustomed to at least 256-colour high resolution screens, and soon the Atari user will have True Colour Falcon displays to ogle at. As most of us have colour vision it seems a shame to be able to see all these glorious colours on screen and yet have such trouble trying to get colour output...

by Paul Rossiter

Every day most of us are bombarded with full colour junk mail. Because of this the effort and costs involved in full colour DTP is greatly underestimated. It is only when colour is attempted that the difficulties become apparent; even so, more and more users are starting to consider some form of colour output, and with the arrival of the Falcon everything seems to be in colour.

Although the ST has a wealth of colour software packages, the area can be a minefield to the unwary and these articles are intended as a guide to assist in making the right choices and getting the right colour output.

There are many ways of obtaining colour output from a computer system. Some are inexpensive, some are incredibly expensive, some are only for short runs or proofs, some are only suitable for long runs of several thousand. The best solution for a particular job varies enormously depending on price, resolution, quality and quantity. There are two main methods of achieving colour from the ST or indeed any computer system: direct output (such as to a colour printer) and indirect output (such as spot colour or process printing). There are also some more novel methods of colour output which are described below.

It is interesting to note that there are really no direct output systems yet for any computer that can give good quality high resolution colour at a reasonable speed for a low price, whereas with monochrome printing the reverse is true. The emergence of Photo CD technology in the next few years may result in low-cost high specification photograph quality printers, but for now...

Direct Colour

Colour printers range from the cheap and cheerful dot matrix printers, which give horrible banded printouts and are really only toys, up to colour lasers and Cannon CLC10's. The right choice has to be a trade-off between price and acceptable quality. All forms of direct colour printing rely on using process colours. The human eye works by sensing intensity and colour separately; the colour sense is also split into three colour bands, allowing colour printing to work with only three colours, Cyan, Magenta and Yellow. Any colour may be represented by mixing varying proportions of these three colours.

Inkjets

Inkjet printers work by silently squirting a very fine jet of ink through a nozzle at the intended sheet of paper. The ink very quickly dries and a high quality printout results. The black printers approach a low-end laser in quality. Early inkjets were notorious for clogging and bleeding but most of the early problems have been overcome. Hewlett Packard are perhaps the leading experts in the inkjet field with their DeskJet range.

THE • EYE

The human eye is not really very accurate at perceiving detail. A maximum of 20 lines per degree (see Fig 1) subtended by the eye can be resolved under ideal lighting conditions. (This explains why pictures look better further away - the lines on a 300dpi laser screened print cannot be distinguished at over 50cm.) The eye can distinguish about 100 levels of grey and is more sensitive to light's intensity than its colour. This gives the number of different colours that the eye can differentiate at around one million. To convince the eye that a printed image is 'real' computers tend to work in 24-bit colour, that is 8 bits for each of the three primary colours. The 24-bit system allows a theoretical 16.7 million colours but in practice the real range, whether on screen or paper, is much less than this. Fully saturated colours are virtually impossible to produce, as the inks/phosphors used are not pure and the texture of the imageing surface is not ideal.

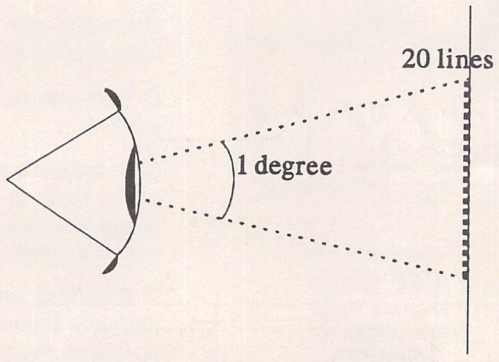


Figure 1: The Eye

Hewlett Packard DeskJets

Hewlett Packard have a dominant position in world wide inkjet sales. This position is due to their incredibly reliable DeskJet range. The colour printers, the DJ500C and DJ550C, give very good quality printout for a reasonable price per copy onto plain paper. The DJ550C was recently reviewed in ST Applications (issue 27) and is the obvious number one choice for serious 'amateur' use. The main drawback with the DJ550C is the dithering needed to obtain large numbers of colours in the output, and this effectively cuts the resolution down: at full 300dpi the DJ550C can only produce 15 different colours. The easy availability of ink cartridges coupled with its versatile paper handling and the abundance of suitable printer drivers makes the DJ range a very good buy.

Cannon CLC10

This beautiful printer is really a colour 400dpi scanner/printer and copier in one (£5000) package. The output quality is as good as a colour laser because the inkjets for each colour are variable, allowing the CLC10 to produce 24-bit colour at 400dpi. The CLC10 has a SCSI port on it and modern software packages on the ST are actually becoming CLC10 aware (DA's Vektor). Whilst the quality is excellent, the colours are still 'flat' (as with any inkjet), the time to print is slow, the ink cartridges cost over 30 pence per A4 page and, of course, it's very expensive.

Wax Transfer

These printers work by melting process colours of wax which are on a long, wide roll onto a sheet of paper, the end result of which is the closest possible to a photograph, with very high resolution, a wide colour range and a glossy finish.

The drawback is that the prints are very expensive - some models can work out at over £2 per page - and the print time is also very long, thus ensuring that such printers are only for colour proofing work.

Dye Sublimation

Certain materials sublime, that is they go from solid to gas form (or vice versa) without an intermediate liquid phase. (Carbon dioxide is a common form of a subliming compound.) A dye sublimation printer produces perhaps the best quality available from a direct printer but its drawbacks are the same as for the Wax transfer printers above.

Colour Laser Printers

A normal laser printer transfers an image of the page onto the paper via a special drum. A colour laser repeats this process four times with four drums and four different colour toners to build up a four-colour image on the paper. The mechanics to ensure good registration and the electronics for processing the image ensure that colour lasers are still very expensive. A typical black laser costs around 2 pence per page to print. A colour laser must cost at least four times this in toner alone, and when the cost of other consumables are taken into account the real cost per page is quite high. The colour lasers at the local copy shop start at around 50 pence for a one sided A4 sheet.

Indirect Printing

The most common form of indirect printing is by means of the offset printing method, by spot colour or by three or four colour printing.

Spot Colour

Artwork from the computer whether from a camera ready original produced on a laser or from a disc printed to an imagesetter by the bureau is used to produce a printing plate. This plate made of paper for low runs and metal for high quality and long runs holds a mirror image of the original wrapped around a cyclinder. The plate is specially treated to hold ink on its surface where there is to be a colour, and this ink in the form of the image is transferred to a rubber blanket wrapped around a metal cylinder. This 'offset' blanket then transfers the ink to the sheet of paper. Obviously the ink used may be of any specific colour but one plate can only produce one colour. If a more eye-catching layout is required then spot colour can be added, where certain areas are put onto another plate which is used to overprint the paper with a second colour. This method can be extended to as many colours as required but each colour requires a separate plate and another pass through the press, thereby increasing the cost (see table 1). To produce spot coloured artwork a colour package is not required; the required areas are simply printed out on separate sheets. A sophisticated package such a Didot Professional CD allows up to eight spot colours to be defined which may be output at will. The advantages of spot colour are that the cost is much lower than full colour printing, the colours can be accurately specified and a lower quality press may be used as a very high accuracy of registration is not usually required.

Presses vary from one colour up to six or more in one pass. Whilst helping keep the paper in registration they do not give much cheaper print as their capital costs (and hence running costs) are much higher.

Where an exact colour is required the 'Pantone' system is usually used. Ink chips like the ones from Dulux allow precise colour matches. Each Pantone shade has its own number - some software packages allow Pantone numbers to be used (Calamus SL) within the document to be printed.

Process Colour

When full colour is essential the image has to be split up into four separations, one for each of the four relevant colours, Cyan, Magenta, Yellow and blacK (CMYK). The imagesetter produces four films at a very high resolution, and each film has a different screen applied to it so that the four colours of ink do not overlap on the final page. Each film is used to produce a plate and these plates are used in turn to re-print ink onto the paper. The tolerances required to ensure that the dots of colour line up exactly are very tight. Imagine a top quality photo being output at 150 lines per inch - the whole system must remain accurate to well within one three hundredths of an inch. Some of the factors that can influence this figure are:

- Film stretching in the imagesetter
- Mechanical tolerances in the press
- Offset blanket warp
- Plate distortion
- Paper shrinking

Most of these effects are not noticed with ordinary printing or even with spot colour, but try a four-colour job and the problems multiply.

Even when the press is set up and working the finished output may bear only a passing resemblance to the original. The colours can change owing to many factors: press gain (dots spreading on the paper), impure process colours, wrong gamma curves (the image on screen is not a true representation) and potentially many more. As may be seen in Table 1 the cost of colour is so high that if the output is not right and a re-run is needed the designer will end up making a loss on the commission. Top-end systems such as Retouche can be calibrated so that the ouptut colours are as close as possible to the on screen colours. This is a complex procedure and the correction factors vary with press, paper and inks.

Alternative Systems

The systems described below can produce colours with a brilliance that cannot be matched by any other form of printing, adding new dimensions to graphic design.

1 *Omnicrom*

The Omnicrom system, now owned by Letraset, has three main uses:

a) Colouring of photocopies/laser prints

b) Laminating and encapsulating

c) Thermal Binding

The usual machine (CT1000) resembles an over-large 'Toblerone' bar (see Fig 2). It comprises a heated roller which pulls in a sheet of up to A3 paper which has a toner image on it. The toner to be coloured is covered in a sheet of coloured foil, and the heat from the roller melts the toner which, as it cools, sticks to the foil and pulls it from the backing sheet. The foil will transfer very accurately to fine detail. Different areas may be coloured in different colours by the judicious placing of small areas of foil before feeding into the machine. The system provides Pantone accuracy with a wide range of over 75 colours in matt, gloss, fluorescent and metallic shades. The machine will colour laser or photocopier output on paper, card, transparent film and self adhesive paper. By building up images on separate sheets of matt transparent film, multi-coloured close registration objects can be formed. The primary aim of the machine is for short runs and mock ups, as the foil is too expensive (50p per A4 sheet) and the process too fiddly for long runs. The quality, however, is excellent and the availability of gold and similar highly reflective foils allows instant colouring for important work. The use of this system for Report covers, signs, menus and the like has no equal. The A3 system costs around £1000, the A4 model is £500, but second-hand models are available at less than half these figures. For the sceptics, try comparing a sheet of DeskJet output with a shiny gold sheet transformed with an Omnicrom.

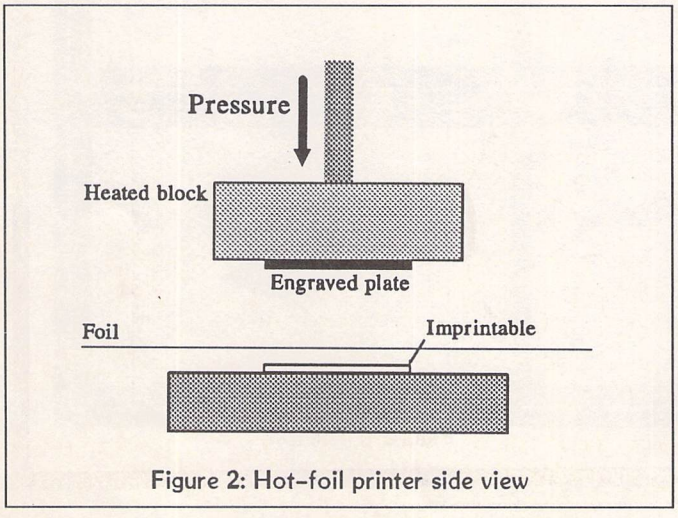


Figure 2: Hot-foil printer side view

2 *Color Tag*

For users who would like the occasional use of an Omnicrom system but cannot justify the price there is its baby brother the 'Color Tag' system. This hand-held model (See Fig 3) costs around £100 and resembles a man's electric razor. The unit holds batteries which heat up the unit to a predetermined temperature. The photocopied original is then placed on top of a special mat, the foil placed on the toner and the unit drawn slowly over the image. The heat and pressure once again transfers the coloured foil onto the toner covered sheet.

The foils for the full sized Omnicrom are A4, the foils specifically for the Color Tag are thinner and cheaper, £4 for a pack of 25 of one colour. The adventurous experimenter could try using a small domestic iron in which case the total layout is very small.

3 *Hot Foil Printing*

Hot foil printing has been around for over two thousand years in the form of gold leaf blocking performed by the Persians. Most people see examples of hot foil every day: diaries, key fobs, glossy business cards, etc., are all the province of the hot foil machine. The Persians used real gold leaf, but nowadays this is a little too expensive and so a cheap plastic imitation foil is used. There are many variants of the basic principle. One of the best known and most versatile semi-automatic machines is the 'Kobo' range; the mid range TC180 (see Fig 4 for a typical hot-foil machine), costing around £1000 new (half that second hand), can print on almost any item barring glass, metal and ceramic at up to 1000 items per hour. The foil used is supplied in rolls of 400 feet long and is available in a staggering range of colours and adhesives to suit all purposes. The foils available cover most matt and gloss

colours, a wide range of metallics and even holographic and prismatic foils for the adventurous.

The principle is that the artwork from a laser or Deskjet is sent to a specialist engraver who produces a 16-gauge zinc or magnesium block with the required image raised on the block's surface. This block is fitted to a hot plate (see Fig 5). The now hot plate (usually 90 - 100° C) is pressed firmly by a lever action against a piece of foil and then onto the work to be printed on. A fraction of a second and the foil transfers onto the imprintable. The action is clean, quick, uses no messy chemicals, is instantly usable and makes little noise.

If really exotic work is required then the foils will happily overprint so that multi-coloured items may be produced. Very effective results can be obtained by using a hotfoil addition to offset printed headed notepaper, the metallic effect being unobtainable by normal inks. A typical price to have 1000 A4 lettheads overprinted with metallic foil would be £25 - £35 depending on area and foil used.

Scanners

The fun of full colour packages tends to pall a little if there is no access to high quality scanned images. Unfortunately, such scanners are expensive. The best known are the Epson range starting at around £600. The computing resources necessary to handle scanned colour images are terrifying. A basic system needs 4MB and a large hard disc, but 8MB is really the level at which a system starts to feel comfortable; when a high quality A4 scan takes up over 24MB things start to appear in proportion. The quality of 24-bit images is startling - printed on a good offset press the quality available is enough for most uses. The next problem appears when it is desired to export these images to the bureau. Modem links take hours, floppy discs by the cartload are required, or a Syquest or Floptical drive is needed. Some enterprising souls (see suppliers' list) will scan in your own photos, etc., for a nominal fee and copy them onto as many floppies as is necessary. If you are using such a service make sure that you have enough memory and that you do not specify too high a resolution just for its own sake (100 dpi is enough for DJ550C type printers).

The only other method of importing colour images is via a video frame grabber. There have been crude attempts at this in the past but with the Falcon 'True Colour almost real-time' frame storage is on the near horizon. Whilst not flat bed quality, the results should be very good.

Software

With the recent price reductions from Copycare the Didot/Retouche packages must be the best value fully featured colour DTP/Image manipulation setups on any system. Most PC software needs such things as an outboard separation module at 'just another £500 sir'!

Didot Professional CD

In order to keep the speed up the Didot programmers decided to make the colour version run in monochrome. A colour display is only allowed on a second monitor, and whilst this is a pain in some ways it really does make the program one of the fastest for DTP. Also, anyone serious about colour will have a graphics card and second monitor.

The control Didot gives over colours is great. Eight spot colours may be defined together with True Colour specification for such things as with text its colour, shadow colour, outline colour and underline colour. When it comes to outputting the files, Didot is very resourceful; most printers are catered for or output can be sent to an IMG file or a TIF file, and Postscript (Mono only) is also catered for. Where Didot scores, however, is in the colour correction field. As the colours on the screen may bear little relationship to the output it is essential to be able to change the way the colours are output. Didot can change the gamma curves for each CMYK component, produce skeleton blacks, under colour replacements and lots more that must make sense to someone.

Retouche CD

Owners of flat bed scanners soon find that they need to edit and manipulate their files. The software that comes with CGS scanners (LOOK II) is basic in the extreme. The only realistic option is Retouche Professional, and the capabilities of this package are virtually unlimited. The only problem with it (which it shares with all other packages from CGS) is the appalling documentation. The manual is basically a strict description of what each option does with hardly any examples or ideas. Having said this, though, once the intricacies of the program are surmounted it can handle any task it's given with ease and a fair turn of speed. Colour images may be edited separately or combined, in CMY, RGB or HSB colour models; colour correction and file output options abound, catering for the most hardened professional.

In order to get the most from Retouche CD a second (colour) monitor is required which must be driven from a colour graphics card such as the Matrix or Crazy Dots.

DA's Vektor

The latest program from CGS is DA's Vektor, closely modelled on Didot Line Art but carrying on into colour and animation with extra facilities such as graphs and animation.

As a fully featured object orientated graphics package it can do anything that Corel Draw can do together with a lot of features that may well be unique to DA's Vektor. As an example any vector image can be filled with a full colour resolution independent scanned image, the only problem being that there are no other programs that can accept such images directly - the images have to be saved as 'TIFF' files first.

DA's Vektor comes with 'Know How', an on-line reference manual. Whilst this is a good idea it isn't complete by any means and trying to learn a complex program such as this by on-line means is frustrating! One of the nice points of Calamus and Didot is the little message at the top of the screen showing briefly what each icon does and which key to press as its short cut - DA's Vektor does neither, unfortunately.

As a package DA's Vektor is highly recommended. It can drive directly most colour printers including the CLC10 and DJ550C in addition to Laserjet, NEC and other mono printers.

One special feature of DA's Vektor that is hidden in the program is that each printer driver has been set up to ensure accurate output results. The gamma curves have all been optimised already. Whilst this may reduce the flexibility for most users it removes a few of the potential headaches.

Calamus SL

The colour version of Calamus is sadly very poorly supported in the UK and runs too slowly to be of much use on anything less than a TT. Its virtues are full colour rendering on screen on one monitor, and of course an easy to use upgrade for Calamus 1.09 users.

Imagecopy 2

In its way this program has to be one of the most impressive cheap pieces of software available. Written by Jeremy Hughes and distributed by the ST Club, Imagecopy 2 can read in most colour images including TNY, Degas, PCX, TIFF, GIF, TARGA & NEO, convert them into many other formats and print them on virtually any printer including

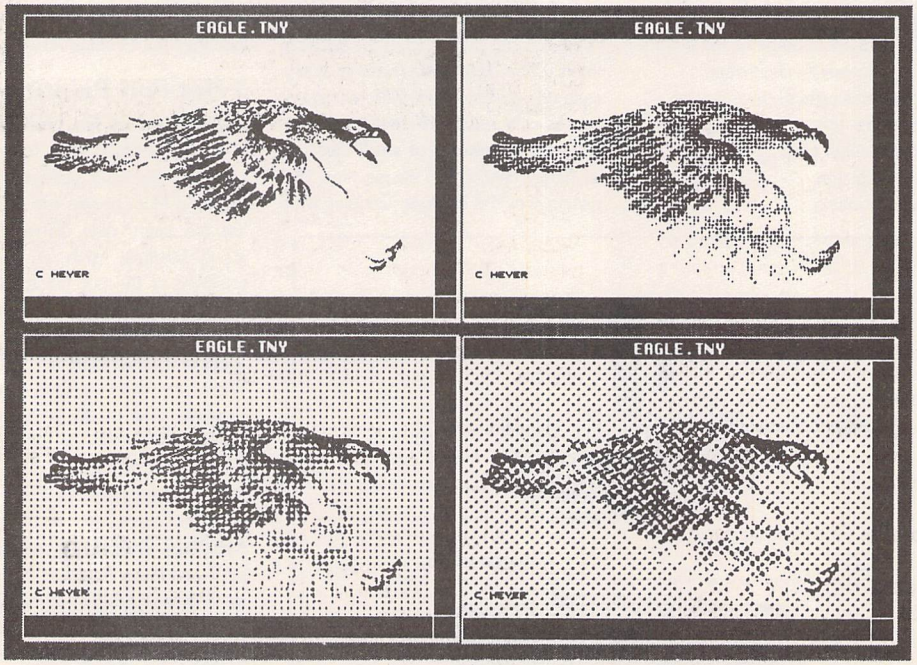


Figure 3: 1x1, 3x3, 5x5, 16x16

the DJ550C. The control over the colours includes varying the grey, blue, brightness, size, scaling, position and number of halftone dots used. Imagecopy allows a trade-off between halftone size and the number of colours (grey scales) available on the screen or printer. Figure 6 shows the differences between 1x1, 5x5 and 16x16 halftones (sadly having to be shown here in black and white).

Clipart

Unless the user is a proficient graphic artist producing competent illustrations is a nightmare. This problem can be largely solved with a scanner. With the proliferation of scanners the issue of copyright appears: scanning any images from magazines, etc., is an obvious breach of copyright. To ensure that the law is not broken special books of copyright-free material may be used.

One famous source of this is the Dover Bookshop (see suppliers list). Their collection of ready to use high quality clipart (see fig 7 for an example) is the world's largest, comprising over 700 volumes, enough for most tastes. Each book concentrates on one subject, e.g. 'Gourmet Food' or 'Women's Heads'. Most books are in black and white but some are in full colour and some contain copyright-free photographs. Each individual book is fairly inexpensive, but collecting a comprehensive collection could prove expensive.

Suppliers/Useful telephone numbers:

CGS (Didot/Retouche/Scanners/DA Vektor): 081 686 8121

JCA (Calamus SL): 0734 452416

BC Design & Print (Scanning services): 0298 78071

CY Services (Bromides/films): 0602 650377

Clipart books
Dover bookshops: 071 836 2111
Graphicus: 0245 225817

Dinsdale Graphics (Omnicrom/Colortag): 0532 430684

Knight Publicity (Hotfoil machines): 0942 877250

Table 1

Printing Prices

The following prices are real costings for specimen print jobs. The prices are for a double sided A4 print on 100gsm quality paper, including the price of bromides from artwork on disc but not any bleeds, guillotining or folding.

Quantity	*Black*	*1-Spot*	*2-Spot*	*4-Colour*	*4 plus spot*
500	63	120	170	250	315
1000	100	180	250	370	450
2000	180	290	400	600	700
5000	400	600	790	1200	1400
10000	790	1170	1550	2350	2700

Print prices supplied by C.Y. *Services* of Nottingham.

Imagecopy 2

Image utility for Atari ST/TT/Falcon computers

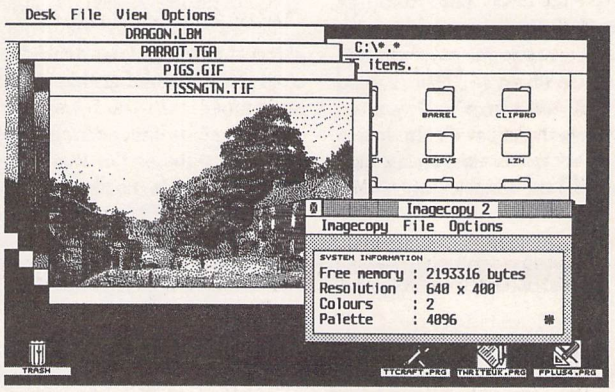
Copy images from screen in any ST/TT/Falcon video mode. Images can be copied by pressing Alt-Help, and a flexible rubber-banding system allows images to be selected with a fine degree of accuracy.

Display images in any ST/TT/Falcon video mode. Colour-mapping and dithering is used to display images in video modes which contain fewer colours. Several images may be displayed simultaneously in GEM-window or full-screen display modes.

Print images and screen dumps in black and white or colour on a wide range of printers, including 9-pin and 24-pin dot-matrix printers, Bubblejet printers, Deskjet, and Laserjet printers. Imagecopy 2 offers print-scaling, variable-sized halftones (up to 16x16) for realistic colour depth, and comprehensive colour controls, and is able to print images containing up to sixteen million different colours (24-bit true-colour). Print-colour options include: monochrome, CMY colour, CMYK colour, CMY separation, and CMYK separation. Colour separation modes can be used to print full-colour images on a monochrome printer.

Convert images between different formats (see next paragraph).

Extensive range of image formats: Imagecopy reads the following formats: TIFF, Targa, IMG, extended IMG, DEGAS,



Neochrome, Art Director, Tiny, GIF, Spectrum, IFF/Deluxe Paint, Windows bitmap, OS/2 bitmap, PC Paintbrush (PCX), and Macpaint. Images can be saved in the following formats: TIFF, Targa, extended IMG, DEGAS, and RSC. TIFF support includes baseline TIFF apart from Huffman compression (uncommon), common extensions such as LZW compression, and the ability to read non-standard TIFF images produced by ST programs such as Retouche. The ability to print TIFF files allows Imagecopy 2 to be used as a print program with True Paint.

User-friendly GEM interface, including window menu bar, pop-up menus, colour sliders. Can be used as an accessory or stand-alone program.

Price - £19.95
Upgrades: from Imagecopy v1 - £10.00; from Imagecopy Colour - £5.00.
Return master disk only.

FaST Club
7 Musters Road
West Bridgford
Nottingham
NG2 7PP

Using GFA Basic

Tim Finch

We take a bit of a steeper learning curve this issue - but it's not over the top! Type in program 4.1. This program asks you to type in your full name. It then takes each name from that line typed in and puts each name found into its own entry in a string array (a string is a variable we can store letters and numbers in, and an array is a collection of variables but with one collective name). Then, each name is checked against a list of possible short alternatives and the alternative is listed if it exists. It's an not a brilliantly interesting program except that it shows a number of new commands and details two new programming concepts that are 'structured' programming techniques. We are going to analyse this programme over this and next issue so as to give a good thorough run down of it.

As usual the program has a number of REM's (shown by the ' marks and the ! marks when used half way along a line). It makes sense to read these and type them in; although they do not affect the program, it will help when you are trying to understand it.

Firstly a string array is dimensioned (made) to have 10 spaces. We then set a numeric variable called finish! (! means that this variable can only store 0 or -1) to the value of FALSE. TRUE and FALSE are GFA constants (prefixed variables you can't change) that have the numeric value -1 and 0 respectively. So, the finish! variable simply has the number 0.

The **DO WHILE.....LOOP** structure is a logical progression from the REPEAT...UNTIL looping we looked at last issue. However, a REPEAT..UNTIL loop will be executed (run) through once before a check is made to see if we repeat. It's just like saying 'Repeat your 4 times table until you've learnt it'. The DO WHILE...LOOP checks something first, however. It is therefore possible that we NEVER do the instructions in the loop. We are checking to see if finish! is the same number as FALSE. It is on first entry and so we move on to the next line. We'll explain the LOOP line when we get there. The screen is cleared and a simple message printed.

Then, the **INPUT** line asks the user to type in his/her full name. The text in the " marks is printed and then GFA puts up a question mark and waits for the user to type a name in followed by the RETURN key. Whatever the user types in is put into the string variable called nayme$.

The **IF...THEN** line checks to see if the contents of nayme$ IS NOT nothing, in other words the user did enter something. The <> symbols means 'not equal to'. the "" indicates a string variable containing nothing! So, if the string variable is NOT nothing, then it HAS something!

The next line adds a single space onto the end of the entered string. This is needed for the WHILE..WEND loop we come to in a tick. The numeric variable counter is also set to 0 here.

The **INSTR** command is an interesting one. It takes in two pieces of information. The first is a string variable - nayme$. The second is another string of character(s). INSTR will then look through the contents of nayme$ and see if it can find the second supplied string in it. If nayme$="Tim Finch's GFA Basic Articles" and the second supplied string was "GFA" then INSTR would find a match 13 characters into the nayme$ (a space or punctuation mark is counted as a character) and thus returns that number, in our program putting the answer in the variable splitpoint. If no match is found it returns the number 0.

The next few lines from **WHILE** to the **WEND** is a repeating loop that actually cuts up the contents of nayme$ into singular names and puts each name in a separate entry in the eachnayme$() string array. We need to start looking at this section by having a sample text in the nayme$ array. Fig1 shows this whole process as I describe it here. Let's say nayme$="Pete Matthew James Richardson " (remember a space was added to the end of nayme$ earlier in the program). By the time we get to the WHILE line the splitpoint variable would equal 5, as the first space found in the string is 5 characters into the nayme$ variable. The WHILE line, just like the DO WHILE example above, does a check before it allows GFA to proceed inside the loop. (If this failed for some reason GFA would immediately jump to the first line AFTER the WEND command further down.) The check it does is to make sure splitpoint is NOT 0.

As splitpoint is 5 this passes and so we proceed to the **INC** line. This simple command increases the contents of the named variable by one. As counter was set to 0 earlier, it now increases to 1.

The **LEFT$** command line next acts like a pair of scissors. This line takes the value in splitpoint (presently 5), minuses 1 from it (to make 4) and therefore says to LEFT$: 'please copy the first 4 characters of nayme$ into eachnayme$(1)'. Thus the name 'Pete' is copied into into the string array eachnayme$() at position 1.

The **LEN** line simply counts the number of characters in the nayme$ string variable and puts the answer in the 'lenth' numeric variable. The length of nayme$ is 30 characters at present and so the lenth variable becomes 30.

The **RIGHT$** command is the opposite of left$. Again a 'count' of characters is provided, and on this example we are subtracting the value of one variable from another. lenth (at 30) minus splitpoint (at 5) makes 25. So, the last 25 characters from the string variable nayme$ are put into ... nayme$! This may confuse, but what is happening is that the last 25 characters of nayme$ overwrite the whole of nayme$ (which was 30 characters until this line changed all that). If you count in from the right 25 characters you get the string "Matthew James Richardson " (not forgetting the space at the end of Richardson!). We have, therefore, effectively trimmed down the contents of the originally entered string variable - the word 'Pete' has gone.

Again we come across the **INSTR** command - keen observers will notice that this line is an exact duplicate of the INSTR line above. It works where in the nayme$ variable the first space is. With our newly made namye$ ('Matthew James Richardson') this figure is now 8.

With that we hit the **WEND** statement which forces GFA to jump back to the WHILE line above. On that WHILE line it checks to see if splitpoint is NOT 0 - well it still isn't and the whole process goes round again. Forward thinkers will have seen by now that this WHILE .. WEND loop is pulling off each name and putting it into separate entries in a string array, decreasing the nayme$ each time to make pulling off the next name simple.

Before we carry on with the analysis of the program, let's pause and look at this concept. We have 7 active lines of commands (excluding the ' REMs) that make the loop that efficiently pull off a task. This is the aim of programming - to identify a task and then produce the fastest, yet smallest number of lines of code (commands) to do it. This WHILE..WEND loop will continue to loop (go back over itself) the same number of times as there are discrete names entered back at the INPUT line. By the time the loop has finished going round (ie when splitpoint is 0, because there are no names left in nayme$ to 'pull off') then we have a string array containing all the separate names starting at entry 1 in that array and a numeric variable called 'count' that tells us how many discrete names were entered (which in our example was 4).

We are going to leave the rest of the explanation of this program until episode five, where we will look at the PROCEDURE bit, and the READ and DATA statements.

Two good books were produced on programming in GFA basic that GFA Data Media used to sell. Considering they have 'defected' to PC as a firm its unlikely that they will still have any. However, try scouring the classifieds in this wonderful publication, or put an ad in the wanted column. The books were called 'Software Development' and 'Advanced Systems'. They should complement what you are learning here and can guide you in the more detailed parts of GFA Basic.

Homework

Try and write a program using INPUT, PRINT, CLS, LEFT$, RIGHT$ and LEN etc. that does this: you input any sentence and the program removes the first 3 words and prints the rest, along with the count of characters left in

the portion you print. So, an example, if you were to type in 'This series of GFA BASIC is very in depth and I'm not sure if we can all keep up' then the result printed would be 'GFA BASIC is very in depth and I'm not sure if we can all keep up'. For those of you with the GFA V3 manuals you may want to look up RINSTR and MID$() - but the homework can be done with LEFT$ and RIGHT$ and INSTR and to prove it I have supplied a solution to the homework on the Disk mag along with the program listing from this episode.

~ One of the saddest software announcements I heard was that GFA Basic Version 4 for Atari was scrapped. This will prevent it becoming Falcon compatible. Oh well, we can't have it all our own way. See you next month.

Fig 1. Table to show changes in 'nayme$' and 'eachnayme$()'

Line	splitpoint	counter	eachnayme$()	lenth	namyme$
INC counter	5	1	""	0	"Pete Matthew James Richardson "
..LEFT$..	5	1	"Pete"	0	"Pete Matthew James Richardson "
LEN	5	1	"Pete"	30	"Pete Matthew James Richardson "
..RIGHT$..	5	1	"Pete"	30	"Matthew James Richardson "
INSTR	8	1	"Pete"	30	"Matthew James Richardson "
INC counter	8	2	""	30	"Matthew James Richardson "
..LEFT$..	8	2	"Matthew"	30	"Matthew James Richardson "
LEN	8	2	"Mathhew"	25	"Matthew James Richardson "
..RIGHT$..	8	2	"Matthew"	25	"James Richardson "
INSTR	6	2	"Matthew"	25	"James Richardson "

(and so on until half way through the last time round)

LEN	11	4	"Richardson"	11	"Richardson "
..RIGHT$..	11	4	"Richardson"	11	"" (Nothing!)
INSTR	0	4	"Richardson"	11	""

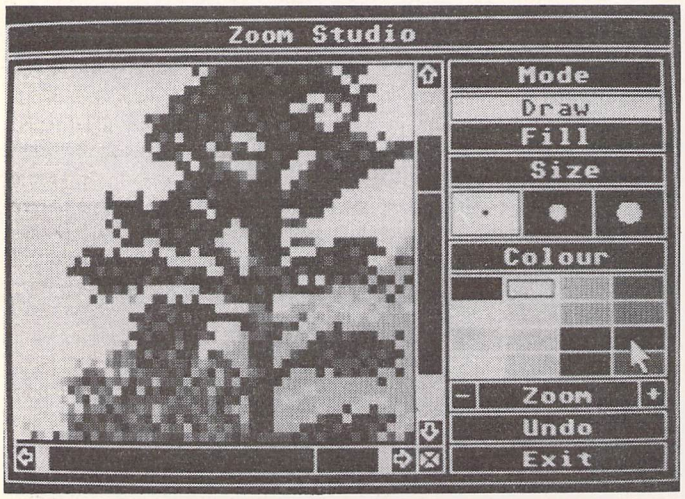
As the INSTR returned 0 here (into splitpoint) the WHILE condition failed and so the loop ends, having done all it's supposed to do.

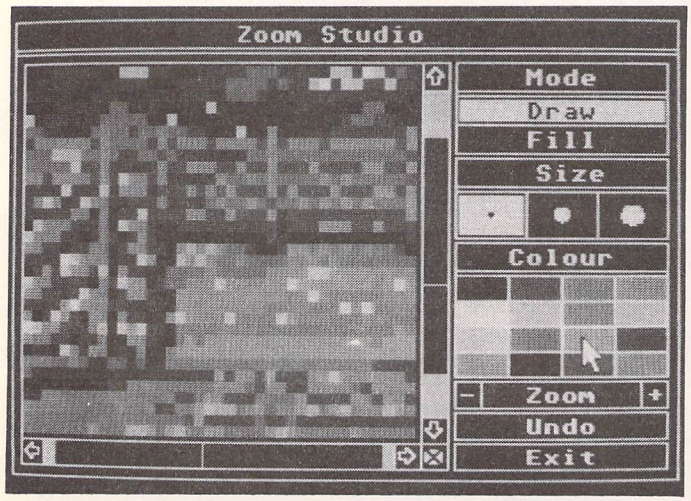
```
'
' Program 4.1
'
' Name analysis program
' Enter your full name and program analyses it!
'
DIM eachnayme$(10)              !prepares a 'string' array for 10 names
finish!=FALSE                   !indicates that the user has not finished yet
'                                FALSE is a GFA variable that simply equals 0
'
DO WHILE finish!=FALSE          !starts a LOOP so long as finish! is FALSE
  '
  CLS                                   !clears the screen
  PRINT "Name Analysis Program"
  PRINT
  '
  INPUT "Please type in your full name : ";nayme$   !Ask for a full name-
  '                                                      answer goes in nayme$
  IF nayme$<>"" THEN                            !if a name was entered
    '
    nayme$=nayme$+" "           !we add a space for the checking section below
    counter=0                   !counter is used to count number of names entered
    '
    splitpoint=INSTR(nayme$," ")    !we find the position of the first space
    '
    WHILE splitpoint<>0             !if we find a space then do this loop,else
      '                              skip straight to the WEND line
      '
      INC counter                   !increase the counter as we've found a name
      '
      eachnayme$(counter)=LEFT$(nayme$,splitpoint-1)  !cut out just that name
      '                                                and put into the array
      '
      lenth=LEN(nayme$)                         !get length of nayme$ in characters
      nayme$=RIGHT$(nayme$,lenth-splitpoint)     !chop off first name in nayme$
      splitpoint=INSTR(nayme$," ")              !and find the first space in this
      '                                         newly cut down string variable
      '
    WEND        ! jump back to While, but only if splitpoint is not 0
    '
    PRINT
    PRINT "You entered ";counter;" separate names"    !tell user how many names
    PRINT
    PRINT "Number";TAB(20);"Name entered";TAB(45);"alternative, if any"
    PRINT STRING$(70,"-")
    '                                   !above lines just print a nice heading
    '
    FOR lupe=1 TO counter               !we need to loop over all names found
      '
      thisname$=eachnayme$(lupe)    !put name from array position into thisname$
      checknayme(lupe,thisname$)    !and jump to the checknayme procedure
      '                              passing in lupe and thisnayme$ variables
    NEXT lupe
    '
  ELSE          !if no names entered at all, tell user this
    '
    PRINT
    PRINT "You have not entered a name!"
    '
  ENDIF
  '
  PRINT
  PRINT "Do you want to do this again? Press N or n to end, another to go again"
  PRINT "and then press RETURN"
  '
  INPUT choice$
  IF choice$="N" OR choice$="n"
    finish!=TRUE                !user wants to end so set finish! to true
  ENDIF
  '
LOOP            !return to DO LOOP line above but only if finish!=false
'
EDIT            !stop the program and return to the editor
'
'
'
PROCEDURE checknayme(entry,nayme$)      !indicate that this is a procedure
  '                                     !and that two variables need to be
  '                                     !passed.
  '
  ' This procedure checks the name supplied against a list in DATA statements
  ' and prints the coloquial or full name if it is found
  '
  PRINT
  PRINT entry;TAB(20);nayme$;           !print up name number and the name
  '
  uppername$=UPPER$(nayme$)             !convert the name all to upper case
  '
  RESTORE daytalist                     !return data pointer to start of list
  READ firstname$,secondname$           !and get first two entries from list
  '
  WHILE firstname$<>"Z"             !do the loop so long as firstname$ is not Z
    '
    IF firstname$=uppername$            !if name enterd is like first data
      PRINT TAB(45);secondname$;        !then print second as an alternative
      '
    ELSE IF secondname$=uppername$      !if name enterd is like second data
      PRINT TAB(45);firstname$;         !then print first as alternative
      '
    ENDIF
    '
    READ firstname$,secondname$         !get the next two names from data list
    '
  WEND                          !repeat loop only if firstname$ is not Z
  '
  PRINT         !trick to counteract ; on the print lines above
  '
daytalist:                              !list of names and alternatives
  DATA JOHN,JONATHAN
  DATA JIM,JAMES
  DATA FRED,FREDERICK
  DATA DICK,CHRISTOPHER
  DATA SUE,SUSAN
  DATA JO,JOANNA
  DATA ROSE,ROSEMARY
  DATA PAT,PATRICA
  DATA PHIL,PHILIP
  DATA TIM,TIMOTHY
  DATA LIZ,ELIZABETH
  DATA PEGGY,MARGARET
  DATA PETE,PETER
  DATA LOU,LOUISE
  DATA JOE,JOSEPH
  DATA PAT,PATRICK
  DATA SMITH,This is a common sirname
  DATA WHITE,This is also a colour
  DATA Z,Z
  '
RETURN                          !marks the end of a procedure
```

Grafix Arts

Paul Keller

TECHNIQUE – Extended Palettes

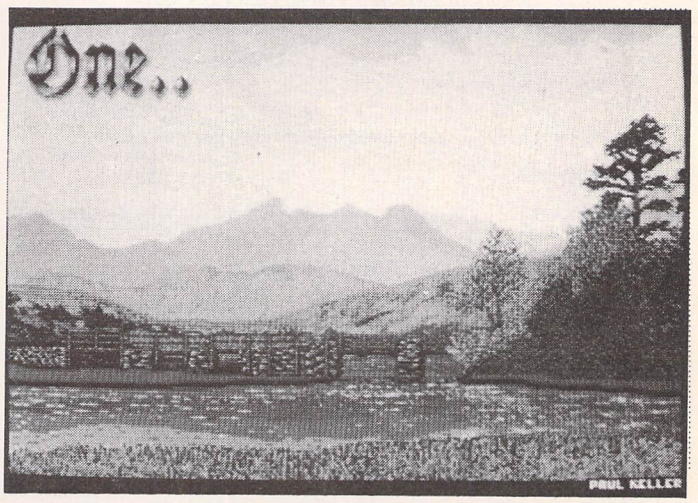




(5) In this picture we have a 'zoom' view showing a small section of the bridge. The stone pillar and wooden bridge have been made to stand out from the rest of the picture by use of a black highlighting line. This line was applied in zoom mode around the back edges of the bridge area: it helps make the subject stand out more from the river background. Black is also one of the colours used throughout all the palettes as an intermediate colour - it helps merge one or more palettes together smoothly. Such intermediate colours as black in this example are best kept at the same position in each of their respective palettes. Good colour positioning helps make any palette integrations a lot easier.

Detail was added to the water in zoom mode by laying fine horizontal lines across it, these then being built upon by brighter colours in a retrograding amount, ending with single white highlighting dots in their centres.

(4) The other way of marking your palettes is to take note of the co-ordinates the boundaries are placed at; then you can see by use of these figures which colour boundary you are currently working in. As usual use of the 'zoom' mode comes in handy for any detail, and here you can see this in the tree to the right of the screen. Canvas has several zoom modes which can be selected from within the studio to enable you to find your preference when working. You will have to memorize the colour boundary area or place the zoom window at the very top or bottom of the current colour palette boundary you are working on. This is because Canvas can not view in full colour from the zoom studio, which means leaving the studio and returning to the main screen work area when you need to check any colour integration of your full colour work.



(6) The corn field in the foreground of the picture was created with the use of the airbrush set to a small nozzle and slow flow. Several colours ranging from dark brown through to orange and yellow were selected together as a random spray. The effect was very quickly achieved using this approach, and the same method was used to form some of the bushes in the foreground to the right of the picture. A similar method to using the airbrush is to use a stipple command with a block of colour, but this, although quicker, does not give so much detail. If you are airbrushing through more than one colour boundary it is important to make sure that all palette areas passed through contain the same colours. If this rule is ignored it will be found that to change any of these colours or match them to similar ones will be very difficult and tedious.

I must emphasise this point; it is very important to get your colour palettes' integration right before setting out on any major drawing work. It must be remembered that if your picture is to contain more than two palettes then one or more of these palettes will have to merge with a palette both above and below. The merging of such palettes does take some skill, but as with all things the more practice you get at using this system the better and easier things will become.

FALCON

APPLICATIONS

Falcon News

November Passes!

Atari's expected unveiling of the long awaited Falcon 040 and CD-ROM drive for the Falcon in November didn't happen, although I still believe that both products will appear. It seems that the release of the Jaguar games console has overshadowed things in the meantime. All resources, both in terms of capital and manpower, were needed to push the Jaguar, and Atari either lacked the capacity or willingness to deliver on the Falcon front. It was also suggested in some quarters that the release of two completely different machines by the same company at the same time could confuse the money markets. I expect that we are talking late Spring or early summer now, once the Jaguar furore dies down. Rumour has it that the Falcon's new case will only ever be seen on the 040 model, with the 030 destined to wear the STE's 'old clothes' for eternity.

However, there is one piece of good news for potential Falcon purchasers. The price is finally coming down! Silica Systems cut the price of the Falcon 030 with 1 Meg of memory and no hard drive to £499 (previously £599) and the 4 Meg version with 65 Mb hard drive (an 80 Mb drive is now fitted as standard) at £799, a cut of £200. A number of other configurations with differently sized hard drives, are also available. This includes a 4 Meg version with no hard drive at £699 and a 4 Meg version with a 209 Mb hard drive at £999, the old price for 4 Meg with 65 Mb hard drive. Other companies are advertising similar prices, some even undercutting Silica's. Although Atari have not announced a price cut on the Falcon, SDL, the trade division of Silica Systems, are Atari's main distributor in the UK. A cut in price from Silica usually precedes an official cut from Atari by several weeks, so if past trends are anything to go by, expect Falcon prices to start falling everywhere within a month or so.

Compo Latest

As stated in issue 35, Compo are offering Falcon owners the chance to upgrade to TOS v4.04. Since details were last published, there have been a few changes. Owing to a market shortage of EPROMs, those of you who have ROMs fitted will have to have them replaced with new ROMs, not EPROMs as previously intended. This has the disadvantage that they will need to be replaced each time you upgrade your TOS. However, the cost of upgrading has been reduced significantly. If you have EPROMs fitted, Compo will re-blow them with TOS 4.04 for £25. If you have ROMs, they will be replaced with new ones for £45. Compo offer a free fitting service and charge £10 to return your machine by courier. You can of course simply order the relevant upgrade and fit it yourself, but it should be pointed out that this will invalidate the manufacturer's guarantee.

Compo are now bundling the screen accelerator NVDI with ScreenBlaster, their hardware resolution enhancer for VGA monitors. The price remains unchanged at £79. Their voice mail system which was announced in issue 35 has just gone into production. It is expected to be available by Christmas and was demonstrated at the Atari Shows in Birmingham and Manchester on 5th and 12th December respectively. Also coming soon is a replacement mouse with a built-in microphone. It is primarily intended for use with the voice mail system or any future applications which require a voice input. Finally, Geneva, Gribnif's alternative to Multi-TOS, is now shipping at £59.95. NeoDesk 4 is not yet available but is expected to be ready in the first quarter of 1994. For further details on any of the above, contact Compo Software, 7 Vinegar Hill, Alconbury Weston, Huntingdon, Cambs.; Tel:(0480) 891819; Fax:(0480) 890787.

The Three F's

Thanks to William Hern's reminiscences of ST Register back in the 'good old days' and a lot of hard work behind the scenes by William, The ST Club and three Falcon enthusiasts, Falcon Fact File was launched at the Atari Show in Birmingham earlier this month. Falcon owners need no longer fumble in the dark and can now join together for the purposes of self help. Falcon Fact File is run jointly by Colin Fisher-McAllum and Kevin Beardsworth on a non-profit making basis. Simply send a stamped self-addressed envelope to the address below and you will be sent a simple questionnaire/membership form. Return it duly completed with a blank HD disk in a jiffy bag and enclose a stamped self addressed label. Your disk will be returned with a list of all members to date, including yourself. Falcon Fact File will be presented in the form of a database, using a customised version of Roger Derry's Shareware program, NameNet. Members will be offered the chance of registering the supplied version or purchasing the professional version at a discount.

Falcon Fact File will, in addition to members' names and addresses, contain details of everyone's hardware and software set up. This will allow members to locate others with similar set ups to discuss hints and tips and offer solutions to each other's problems. Once everything gets underway, the disk will be updated on a monthly basis and will be supplied free upon receipt of a blank HD disk and a return-stamped, self-addressed jiffy bag. The disk will be filled up with some Falcon PD and Shareware and of course you are invited to send in any good programs. Contact Falcon Fact File, 11 Pound Meadow, Whitchurch, Hampshire; or Email rderry@cix.compulink.co.uk.

Getting A Warped Perspective

P
I
P
E
R

Sometimes you have to be cruel to be kind. This has no relevance to the review, I just thought you should know that.

When last reviewed (in March), the magnificent Warp 9 (distributed, coincidentally, by the ST Club) was exalted as being really rather good as a screen accelerator, with the added benefits of changing your screen fonts, giving you a back-drop picture and crusading to do some screen saving. I was so impressed, I bought one.

Since then, I've moved on to the Falcon, but Warp 9 wasn't able to come with me. The Atari desktop, despite some dramatic improvements, remains irritably tardy in trying to catch up with you. A speeder-upper was needed.

Enter Warp 9 V3.8, the updated version with a slightly updated price (so you try telling Wall Street they've got the exchange rate wrong). This comes in three different flavours, ST, TT and Falcon, all SpeedoGDOS compatible, and here, in the Falcon section of the magazine, guess which one I'm going to try?

Slipping into Overalls

Firstly, the overall approach. The main manual remains the same, a well written and easily understood document that doesn't assume you stay up all night reading extensive novels in binary code. Then there's an addendum for version 3.8, keeping with the same style and letting you know what's changed.

Sticking with the old stuff first, you still have an accessory that lets you adjust the setup while the program is running, with no need to re-boot, so you can decide to turn the screen accelerator off, get rid of zoom boxes (highly recommended), adjust the mouse speed, use the first three function keys as alert box keys, change the font, change the fills, all the other good stuff that made this more than just a go-faster package. But now, you also get the option of setting up your Extend-O-Save screen saver.

"Extend-O-Save?" I hear you cry. Well, no, I don't really. This is just me making use of dramatic licence, on which I now have to pay VAT. But that's not relevant right now either. Extend-O-Save is a screen-saving module based (loosely) on the PC and Mac program After Dark. Instead of just turning all the white dots to black and vice versa, this package will do things like dropping bits of screen to the bottom, or flip it around, or have various flying shapes move across the screen (including toilet rolls if you go for the Flying Thrones option). Most of these work in all Warp 9 resolutions, so it can get quite colourful out there instead of getting a single pixel burned in to your screen.

All of which is very nice, but isn't it the sort of thing you might expect from PD goodies, at least if you're an unquenchable optimist? The thing you want Warp 9 for is to make your Falcon go so fast it gets friction burns. What's its incineration capacity?

Any Colour (as long as it's...)

For a start, it's pretty limited if you want to shift over into True Colour mode. Basically, it doesn't work, and isn't designed to do so in this mode. With enough demand, there will be a later upgrade, but for now, it just shuts down in True Colour.

At the other end of the spectrum, how does it cope in black and white?

Once you get it installed (dead simple: copy the program to the auto folder, copy the accessory to the boot drive, re-boot; even I got that right) the improvement is noticeable and obvious: windows open and close faster, reading a READ.ME file is much quicker. The thing that's not so clear is just how much quicker.

Back on the Benches

To find out, two sets of benchmarks were used: Quick Index and GEM- Test. Quick Index comes with Warp 9 (it being the only son of QuickST 3), and hence tests those things that Warp 9 was designed to improve. GEM-Test comes with NVDI, and hence tests etc., etc.

You can see (at least, you can if you look at Figure 1) that Warp 9 quite easily wins a place as a worthwhile program. In its own test arena, Quick Index, it stomps all over the Atari routines except in TOS scroll, where it always was a little disappointing. GEM-Test shows some areas where it merely keeps pace with Atari, and even one where it falls notably behind (Inquire Functions), but on the whole, a very respectable showing. For all the tests, it has zoom boxes switched off, which gives it an even better showing.

And in this corner...

But wait! What's that other column I see in the table? Goodness gracious, it's the contender for the Falcon screen accelerator title, NVDI, strutting its stuff through the test. Well, I don't know how it got in there, but it looks all set up for a fight. Over to you, Harry.

Basically, the outcome of this tussle depends on whose viewpoint you take. Quick Index, a trifle biased towards Warp, shows Warp and NVDI about level for scroll and string, but Warp steams ahead with text and dialog. GEM-Test, on the other hand, tends to favour NVDI and shows it as the clear winner on most counts, though with AES Object Draw - basically a dialogue box being called a number of times - it falls behind significantly. Who do we believe?

Flying Colours

Strangely, there's an easy way to find out. Warp 9 does not handle True Colour, but it will go as far as a 256 colour palette. And over in Figure 2, we can see what that reveals.

On this playing field, even Quick Index finds Warp 9 to have fallen from favour. It's still doing significantly better than the raw Falcon can manage, but even its previous best showing, the dialogue box, is now trailing behind the NVDI performance.

Skipping across to GEM-Test shows an even slacker display, with Warp slipping back to mere Atari level in a number of places. Surprisingly, NVDI even manages to slide beneath Atari for Raster Operations. Must be the drugs.

Are we compatible yet?

So does this conclude the championship bout? Nope, sorry, more to come.

Back in Mark Baines' Warp 9 review in March, he let flow his

Figure 1

Mono High Res

	Falcon	NVDI	Warp 9
Quick Index v2.2			
TOS text	157	487	640
TOS string	158	262	258
TOS scroll	211	239	211
GEM dialog	193	601	1022
GEM-Test v2.0			
Text Output	99	1043	646
Lines	99	283	218
Rectangles	99	194	168
Polygons	99	288	98
Circles/Ellipses	99	397	97
Raster Operations	98	110	96
Attribute Functions	100	844	563
Inquire Functions	100	602	86
Escapes	99	357	218
BIOS Output	97	221	266
GEMDOS Output	95	125	127
AES Object Draw	98	307	572

Figure 2

256 Colours with Overscan

	Falcon	NVDI	Warp 9
Quick Index v2.2			
TOS text	24	105	76
TOS string	32	112	90
TOS scroll	5	19	17
GEM dialog	94	318	267
GEM-Test v2.0			
Text Output	63	446	187
Lines	42	283	41
Rectangles	29	36	16
Polygons	59	122	59
Circles/Ellipses	74	203	74
Raster Operations	16	8	16
Attribute Functions	76	574	525
Inquire Functions	76	469	77
Escapes	25	24	18
BIOS Output	29	33	25
GEMDOS Output	36	33	32
AES Object Draw	67	179	138

grief that Warp 9 would not work with OverScan, a screen enhancer, which Quick ST 3 had been happy to co-operate with. Obviously, his comments have been taken to heart, and now Warp 9 won't work with Screen Blaster, a screen enhancer from Compo which gives you greater resolution than the standard Falcon modes. Isn't it nice to know that people listen? Okay then, wouldn't it be nice to know? NVDI, on the other hand, works with outstanding happiness with Screen Blaster.

Warp 9 also won't keep company with MultiTOS, though it claims to be fully compatible with Geneva, the multitasking program from Gribnif that isn't even out yet. I look forward to testing that out, but at the moment it'll just have to be taken on trust. Or not. But it's good to hear that Geneva's got far enough to have things compatible with it.

Winding Up

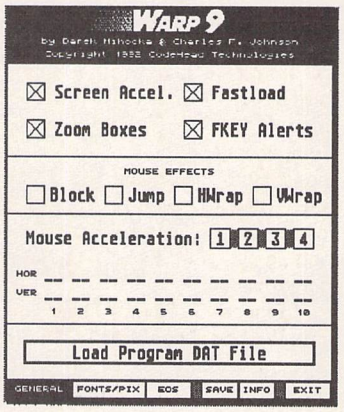
What we have here is a very reasonable screen accelerator. As with all screen accelerators, it is quickly ignored and you only notice it when you have to go back to the old, slow routines.

The advantage this has is that it's not just an accelerator, it also enhances your display with pictures, backdrops, fonts, fills and entertaining screen saving routines, makes your mouse move faster, has PinHead, the program fastloader, built in to it, lets you use function keys instead of having to position the mouse (it doesn't sound like much, but trust me, it's nice), and will automatically switch itself off for certain programs if asked politely in a configuration file.

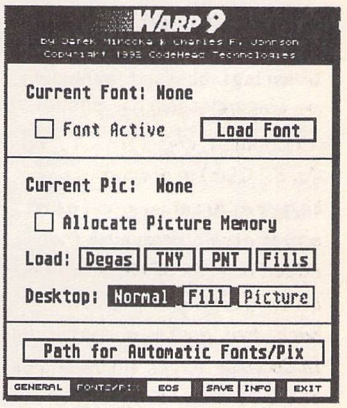
The contest between which is better, NVDI or Warp 9, has a different winner depending on your perspective. NVDI is the only screen accelerator if you use True Colour. It's definitely a better accelerator if you use 256 colours. If most of your work is done in mono, there's no definite winner.

Offset against this, Warp 9 is the cheaper model at £29.95 compared to NVDI's £49.95. It's MUCH easier to understand what the manual's talking about, and easier to use the program to your best advantage. And it has LOTS of extras.

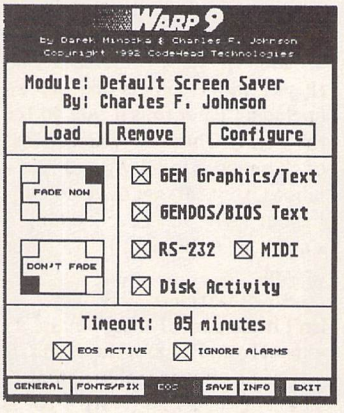
If you're someone who sneaks to the end to find out who wins, you're out of luck. NVDI is an all-round better screen accelerator, particularly in colour modes. Warp 9 is an all-round better package, particularly when you consider the price as part of it. Neither of these is a "No way. Naff" product. You pays your money, you takes your choice.



△ Figure 3



△ Figure 4



◁ Figure 5

Product:	Warp 9
Version:	3.8
Price:	£29.95
Supplier:	The ST Club
	7 Musters Road
	West Bridgford
	Nottingham
	NG2 7PP
Tel:	0602 455250

Falcon

All readers' letters that deal exclusively with Falcon-related matters are now printed on these pages. The layout is similar to the standard Forum pages - see p.41 for key.

Falcon Monitors

Graham Hinton - FF STA 36
Andy Richardson - FF STA 36

A The ideal monitor to use with a Falcon is a multisync SVGA type. If you can find one which will sync between 15Hz and 40hz horizontally, you will have the advantage of displaying both VGA-style (including enhanced modes via Screenblaster or Blowup030) and RGB modes including 640 by 400 Truecolour (although interlaced). Such monitors include the AOC multisyncs sold by the Atari Workshop, and the Microvitec Cub-Scan monitor sold by Ladbroke. Amusingly the new Commodore 'AGA' monitors also allow this, as well as having inbuilt stereo speakers.

To connect such a monitor does require the construction of a simple adapter, similar to the standard VGA/RGB adapters sold by Atari. I have sent a copy of the details for this adapter, including diagrams, to the ST Club, and I expect it will be available on a PD disk quite soon (available now on PD disk DMG.38). Usefully, such an adapter no longer requires a reboot to change modes, as the Falcon checks the setting each time a call is made to set the screen. So you could work in Hires mode and, when you wanted to run a true colour tv-only game, flick the switch and the change takes place when the program attempts to set a TV video mode.

Jonathan White

A With regard to the questions asked in the October Falcon Forum concerning monitors, I offer the following information from my research and experience so far:

1. Multisync monitors normally connect to the Falcon using the standard VGA video adaptor.
2. If the monitor can sync at a scan rate of 15.75 Khz (the same as Atari SC1224 and Philips 8833 monitors) then it can display some true colour modes not possible on standard VGA monitors. To do this however, the monitor must be connected in the same way as an RGB monitor using a VGA to ST adaptor or a specially made up lead. The Falcon knows which monitor is attached by means of monitor detect pins (which are connected differently in each adapter) and adjusts its video signal accordingly.
3. The modes available from the desktop depend on which type of monitor the Falcon detects - no one monitor will display all possible modes without changing the type of video adapter used but I presume it is possible to build a monitor switchbox of the type used to connect low and high resolution monitors to the ST - ?
4. The 'most graphic modes without using interlace' can be displayed on VGA monitors. They cannot however display 640 x 400 true color and overscan modes and a lot of the outstanding pictures and demos available in the public domain need these!
5. For those with Philips 8833 MkII monitors - Ladbroke Computing supply a special variant of the video apaptor plug which gives all the Falcon, monitor and stereo connections in one set of leads. The price is just under ten pounds.

I have bought an NEC Multisync 4FG for the VGA modes and I am resigned to using my Philips RGB or a portable TV to access the true color modes. The display on the NEC is outstanding - as good as the Atari Hi-Res but with more screen area and all those lovely colours! I have also found that many of the 'better' ST applications can run in VGA modes and take advantage of the extra screen area. For example, Adimens, Calligrapher (in mono VGA), Highspeed Pascal, Superbase Pro, Lattice C all benefit.

I recommend the NEC or a good SVGA monitor which is capable of at least 800x600 non-interlaced. I believe that these monitors (with Screenblaster or BlowUp030 to access the higher resolutions) together with a portable TV for true color applications offer the best compromise.

Paul Kelly

I After forking out for a Falcon and owning a 9-pin D plugged monitor I was not prepared to buy a VGA monitor adaptor and still have to make or buy a lead. Also my monitor can cope with 50Hz vertical and 15Khz horizontal synchronisation which is a mode I would like to exploit for added compatibility.

Connecting the R, G, B (attenuate to taste), vertical, horizontal syncs and ground of the Falcon to the same on my NEC II gave me an improved TV mode (quite good in True Colour but not as good as the same resolutions with a VGA). This should do for ST programs that need this.

To flip the Falcon into VGA mode M0 needs to be grounded similar to monochrome detect on STs but with an undocumented improvement, this only needs to be grounded on booting or reset. (The monitor port on my ST once had a loose contact on the monochrome detect pin causing resets every now and then until I had one reset too many and repaired it.)

M1 is also present which if grounded as well tells the Falcon that an SM124 or similar is present. I guess the ST monitor adaptor makes this happen when an SM124 is plugged into it. To use this mode with a colour VGA monitor, as with an ST, the RGB conections need to be disconected from the RGB outs of the video port and all connected to the mono out on the Falcon. I'm not sure if this will make things more compatible than using ST High with a VGA. Reports from people using an SM124 would be useful and connecting up my frequency meter to the vert signal will also give a clue.

Also on the port is the composite video out, which is useful for recording your True Colour animations on a domestic video recorder (S-VHS machines can use RGB), Audio if your monitor has better sound than the speaker and a volume control, and genlock connections for those interested.

A multimode switch box with various outputs is easily possible, tailored to your own needs, or will there be a third party one on the market soon?

I am just using a 19-pin to 9-pin lead with a normally closed microswitch grounding M0. Holding this during reset/booting gives ST colour monitor (otherwise VGA). Adding a normally open switch across M1 and ground will give SM124 mode on boot but will need to be a four pole push to make push to break to change the RGB to mono conections so I won't bother with this until I know its usefulness.

WARNING: I have not given any more detail than this because it's not a good idea for a novice to attempt this and seriously and permanently damage their brand new Falcon. Also for this reason I cannot have any liability for the accuracy of this information or damage caused to equipment by anyone using it.

Can anyone give me any details (hardware

Forum

connections) for external SCSI/SCSI 2 Devices? I've heard some hard drives won't work. Which ones do and which ones don't and why? Please write to: J. Williams, 85 Fountains Close, Eastbourne, BN22 OXE.

J. Williams

I When I changed from an ST to a Falcon, I thought that the problems of needing two monitors (colour and mono or one multisync) to show all resolutions would disappear, but they have not! I have an SVGA connected to my Falcon, I get an excellent picture in all resolutions (easily as good as my old mono monitor) and brilliant colours, BUT many (all)) of the demo programs around for the Falcon will not run on the SVGA and I have to switch to a TV to run them. Since all these demos appear to use True Colour and overscan, I can see why the SVGA will not work with these programs.

However, I am not really concerned about running demos (once seen, forever forgotten), but what does concern me is that this VGA non-compatibility might spread to other types of software. I would like to make a plea that any software written for True Colour modes should also have the option to be run in the 256 colour 640 x 480 at least.

Phil Hodgkins

Noiseless Falcon

Q Is it possible to make the Falcon as noiseless as an ordinary ST?

As far as I know, all Falcons have a cooling fan running all the time. I admit that it makes no difference when you have a hard disk making more noise than the fan. But there are users whose main reason for using the ST instead of PC or Mac is that the ST is the only desktop computer giving the possibility to run serious software without harddisk, i.e. without permanent noise. And with the floptical drive, there is today a noisless alternative to the usual harddisk.

It does make a difference, when you sit alone at night and try to do some creative work. Permanent noise reduces your ability to get new ideas, even if you think you don't notice it. It does not help to have a big hard disk full of large software systems if your own brain is cut down to half effectivness.

I intend to move the power supply unit out of the case, thereby removing most of the heat. Then it should be possible to switch the fan OFF. But because of the Falcon's high price I think I must wait until I get some expert advice.

Also I hope some hardware add-on will soon be available such as a temperature control device switching ON the cooling fan only when it is really getting too hot inside.

Power Without The Noise. That could sell a few Falcons more, I think. One to me anyway.... Otherwise, if I have to live with noise, I could as well buy a PC and Gemulator.

Paul Dion

● Falcons are remarkably quiet machines. The (optional) internal hard drive is a quiet 2.5" device of the type fitted to most notebook PCs, and the fan hum is bareley noticeable. If you re-cased a Falcon in one of the kits supplied by System Solutions you could probably dispense with the fan altogether - or settle for a thermostatically controlled device.

Falcon Compatibility

Hartley Patterson - FF STA 33
Colin Fisher-McAllum - FF STA 33
Graham Hinton - FF STA 34
Phil Hodgkins - FF STA 34
Brian Mulhall - FF STA 36
Graham Hinton - FF STA 36

I There were some inaccuraies in Graham Hinton's letter. Saying that XBoot 2 would need updating, for example, when Xboot 3 has been available for almost a year. A question mark on Edge 1.04, when it works perfectly on the Falcon and has saved me a few times so far. MultiTOS is not a joke. A multi-tasking system that runs at 80% of the full speed of the computer is a major achievement - and not a joke.

I think most of the problems he's experiencing are due to running all those out of date versions of programs. I am very happy with my Falcon.

I have no problems running all the programs I use and the list is long, but here goes if ST Applications want to publish my list: Cixcomm/Cixread, Everest, ImageCopy 2, Connect 2.20 (Graham Hinton has 1.60), MultiDesk Deluxe, GSZRZ, XYZ, Selectric, UIS III, Diamond Back 2.51, Diamond Edge 1.04, TN PCALC, GEM View, STraight FAX 2, Atari Works, HiSoft BASIC 2.10, WERCS 1.25, Cubase 3.02, That's Write, True Paint, First Word Plus, TomShell, Winx, Knife ST (problems with non-standard partitions), NameNet, Let 'em Fly, KRoget, XBoot 3, Pinhead, DFormat, DFind, STalker, MemFile 3, STeno, STZip, ArcShell, XLator 1, Pinhead 2.1, Cold Hard Cache, TCache.

I think that's enough, although I have plenty more programs that work just fine.

Ofir Gal, CIX 854

I I think the Falcon achieves quite good compatability, considering the fact that it has different video and audio circuitry, a diffent CPU and a different version of the OS. The new system has achieved as high compatability as I remember happening with, for example, system 7 on the Macintosh. And how many Windows 2 (yes, it did exist) programs run under 3.1? There must always be compromise. You can perform massive upgrades, or provide cast-iron compatability, but to believe you can provide both is somewhat fanciful.

Even so, with programs such as Backward, I can run the ST programs (even games) I use with ease. The only program I have found which does not run is Timeworks DTP, and with the release of SpeedoGDOS and the coming arrival of Easytext Pro Vector, Papyrus and Atari Works, I doubt I shall miss it much. Besides, it was time I upgraded anyway.

This is a pertinent point. Several of the programs Graham Hinton listed - Xboot, Rufus and Connect spring to mind - are at least one version behind the current shipping version. If he buys new hardware, he should at least want to run the latest version on it. I do agree that the Falcon is not perfect, but to dismiss it in the way he has is unfair. I have no problems using any of the following, which I use regularly: Calligrapher III, Wordflair II, Lattice C (although the upgrade STILL isn't ready, it does work fully), Wercs, Wordflair II, Gemview, EasyDraw, PageStream, Connect, Everest, 1st Word Plus, TouchUp.

I can find a program to do virtually any task which will run on my Falcon. So where is the problem?

Jonathan White

I Silhouette does work perfectly on a Falcon. I'm sorry if the information I gave STA 30 has caused any problems for anyone; I think I had an auto program causing problems with the auto-tracing function. Silhouette also works very well with Speedo GDOS (which I can recommend to everyone, it is fast!).

Phil Hodgkins

Monitor Life Preserver

by Damien M. Jones

As promised, this month our screen saver gets some "teeth" added to it. The actual screen saving code is added to the accessory frame. Another dialog is now handled by the accessory - this one lets the user choose which events the screen saver watches - and code was added for some of the buttons in the main dialog.

The Watch Dialog

This dialog, shown in Figure 1, contains buttons that let the user choose which events are "watched". Our screen saver will not start saving the screen until none of the watched events occur in a specified period of time (the default time is two minutes).

To support the watch dialog, code has been added during the initialization of the accessory and in the main form_do loop. This is not substantially different from handling either the main dialog or the info dialog, so I will not go over it in detail. You should notice, however, that as soon as one of the buttons is selected, the appropriate flag is changed immediately, rather than waiting for the user to click **Done**. (Some programmers prefer to examine all the buttons after the user is finished with the dialog; I prefer to update things right away if possible.)

More Dialog Code

Since there's actually a working screen saver now, I added the code to handle the **On** and **Off** buttons, and the **Delay** buttons. For the **Delay** buttons, two subroutines were added: get_time_string and set_time_string.

get_time_string looks in the main dialog and figures out what time has been entered there. It does this by adding place values repeatedly to build up the time value. It is called when the main dialog is closed, or whenever the "+" or "-" buttons are clicked.

set_time_string does just the opposite; it takes a time value and converts it to an ASCII string in the main dialog. It does this by repeatedly subtracting place values from the time and counting how many times it can do that for each place. set_time_string is called just before the main dialog is displayed, and every time the "+" and "-" buttons are clicked.

These two routines are probably not the most efficient routines in existence, but they don't have to be fast or efficient; they aren't called that often.

How it works

What the screen saver does, at the moment, is simply monitor system activity, and if a certain period of inactivity is observed, the screen saver starts saving the screen. When some activity occurs, the screen saver is shut off.

To determine how much inactive time has passed, the accessory hooks into various interrupts (mouse, MIDI, and serial) and polls some others (disk activity and keyboard). Whenever one of these actions is noticed, the time it occurs is recorded. Periodically (50-70 times per second) this time of last activity is compared with the current time; if the last action was more than two minutes ago (or however long) then it's time to start the screen saver.

The activity monitors are done in two ways: intercepting interrupts and polling. The first method, intercepting interrupts, is used to monitor mouse, MIDI, and serial port (modem) activity. If you look at the int_mouse, int_midi, and int_modem routines, you'll see they're very simple. (A diagram of these appears in Figure 2.) First, they check to see if the user has chosen to "watch" that activity; if not, the routines immediately jump to the original routine. (The address of the original routine is filled in during initialization.) If that activity is supposed to be watched, then the time that the activity occurred is recorded. The 200Hz system timer (recorded at address $4BA) is used for this, because it always runs at the same speed, no matter what resolution the computer is being run in. Then these routines jump to the original interrupt.

It's important that these routines jump back to the original interrupt. We don't want to change the activity that occurred (mouse, MIDI, or modem), just make a note that it did occur.

During initialization, an XBIOS(34) call is made. This returns the address of the **keyboard vector table**. This table contains pointers to various handlers used by the keyboard and MIDI interrupt routines. Two of these, **midivec** and **mousevec**, are redirected to our routines.

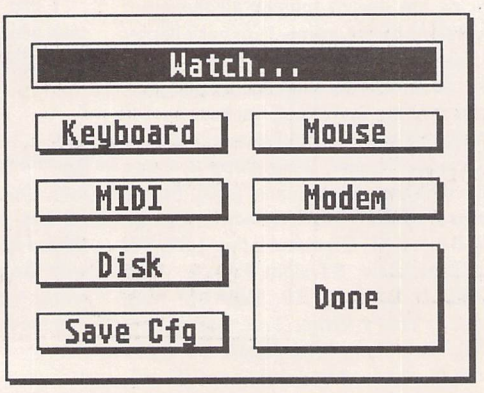
The serial port is watched by redirecting the MFP's **RS-232 Receive Buffer Full** vector to our own routine. This interrupt is triggered whenever a character is received on the serial port (modem).

The other two activities, disk and keyboard, are polled rather than intercepted. The reasons are slightly different in each case. For disk activity, I could have intercepted the rwabs() (BIOS 4) call, but it was much simpler to watch the **flock** system variable. This variable is set whenever the system is using the DMA registers; about the only time this happens is when disk activity is taking place.

Watching the keyboard, however, is tricky, because on the ST, mouse data comes in from the keyboard processor. When keyboard or MIDI data comes in, an interrupt is signalled and the processor stops what it's doing to take care of the keyboard or MIDI data. The normal interrupt routine in the ST first checks to see if the keyboard or MIDI sent the data; if it was MIDI, it calls the MIDI handler (which is intercepted to watch MIDI data). If it was keyboard, it calls the keyboard handler. The keyboard handler then looks at the incoming keyboard data to see if it is mouse data, clock data, joystick data, or just a keypress. If it is mouse, clock, or joystick data, another handler is called (and the mouse handler is intercepted so it can be watched). If it's just a keypress, though, it is dealt with **internally** by the keyboard handler. To intercept the keyboard handler would mean reproducing the code that decides what sort of data is coming from the keyboard - a nuisance. There had to be an easier way!

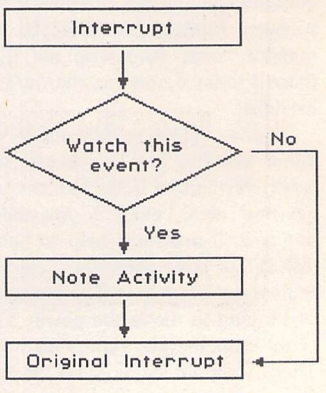
Fortunately there was. It is possible to get the address of the **buffer** used by TOS to store keypresses. What the screen saver does is check this periodically to see if new data has been stored in the buffer. If it has, then keyboard activity has occurred. There is a problem with watching the keyboard buffer, though - pressing a key like SHIFT isn't recorded in the buffer. This can be watched too, though, by obtaining the address where TOS stores the status of the SHIFT keys (and CONTROL, ALTERNATE, and CAPS LOCK) and seeing if *that* value changes. This address is different with every TOS version, but TOS gives us a little help (again) by providing this address in the TOS header. The TOS header isn't complete in TOS 1.0, so our accessory checks for this and provides the TOS 1.0 address ($E1B) if necessary.

The only thing left is to periodically check how much inactivity there is. This is accomplished by using the **Vertical Blank Interrupt** (VBL). This interrupt occurs 50-70 times per second (depending on your monitor type) as the scanning beam moves from the bottom of the screen to the top. TOS keeps a list of routines it needs to execute during every VBL, and there are usually plenty of blanks in the list; our accessory just puts the address of its own routine in one of the blank slots. The number of slots in the list is provided in **nvbls** (address $454), and the address of the list is stored in **_vblqueue** ($456). Then every VBL, the periodic routine is called, which checks the period of inactivity and activates or deactivates the screen saver accordingly. (A diagram of



◁ This is the watch dialog; from here the user selects which events the screen saver will monitor.

▷ This shows what happens during the mouse, MIDI and modem interrupts.



the VBL routine is shown in Figure 3.)

How the Screen is Saved

This is the easy part. When the screen saver is activated (after a period of inactivity) the colours are saved, and then set all to black. When the screen saver is deactivated, the colours are restored.

On a monochrome monitor, however, it isn't possible to set all the colours to black. To save the screen, a timer is used to invert the screen every five seconds.

Caveats

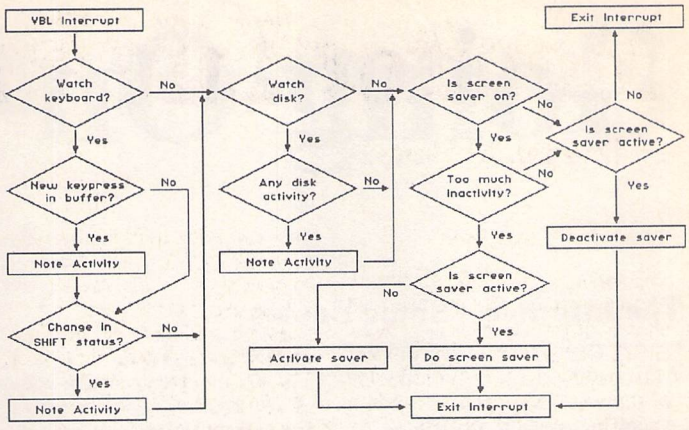
In the save and restore routines (saver_start and saver_end) I have accessed the hardware in the ST directly. This is generally considered bad programming, but since the screen saver routines are called during an interrupt (the VBL) the "proper" TOS routines cannot be used. The technique I used will work on STs and STes, but it may be unreliable on TT030s and Falcon030s.

TOS is rather inconsiderate when telling accessories it's switching resolutions - it doesn't tell them what it's doing, so they never have a chance to disable any interrupts they might have installed. (Accessories probably aren't supposed to hook into interrupts, but that's another story.) If our accessory is installed, and a resolution change is attempted, it will probably crash the system and make a reboot necessary.

There are ways around this, of course. One of the simplest is to move the interrupt-hooking code into an AUTO program, which may be done in a future article. For now, just keep in mind the limitation. (This same limitation applies to any accessory that intercepts interrupts, traps, or generally plays havoc with the system!)

Some programs replace the serial port handler with their own routines. If they do this, they will replace the monitoring routine installed by the screen saver, which will make the accessory unable to see whether the serial port is in use.

Other programs change the address of the keyboard buffer; if they do that, our accessory won't know when keys are pressed, so it won't be able to watch the keyboard data. This is annoying, but fortunately there are very few programs that do this.



△ This shows the Vertical Blank Interrupt routine. It's the "guts" of the screen saver, and together with the mouse, MIDI and modem interrupts, it's what makes the screen saver work.

Next Month

Things get interesting next month, as I explain how to automatically disable the screen saver for certain programs, and how to use mouse hot spots and hot keys to control the screen saver, without having to call up the accessory. Another dialog will be added, and I'll show how the **Save Cfg** buttons will save the screen saver configuration.

This month's listing is on Disk Mag DMG.38.

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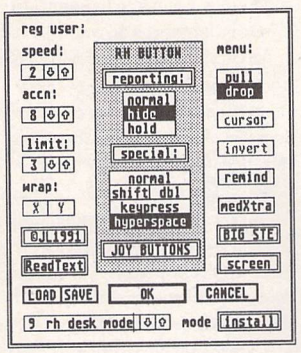
Mouse Tricks 2



- Mouse Tricks combines many of the functions of existing mouse utilities in a single desk accessory and adds numerous extra functions of its own.
- Mouse Tricks can set up suitable modes of mouse behaviour for particular programs. An optional screen saver is also included.
- Mouse speed can be reduced as well as increased. This allows a cross-hair mouse add-on such as "Tracey" to trace artwork of any size.
- All the functions of Mouse Tricks can be adjusted through a set of easy to follow dialog boxes.
- As many as 20 different settings can be named and saved, and each mode can be selected via a dialog or a user selected keycode.
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- Mouse Tricks contains a text reading utility, Read Text, with which you can load, read and switch between as many as eight text files from within any program that allows access to desk accessories.
- Read Text can also be invoked by double-clicking on the desktop icon of the file you want to read, or by pressing a user defined keycode.
- Big STE is a virtual screen utility that uses the STE's video display hardware to provide instantaneous smooth scrolling around virtual large screens of any (feasible) dimensions, with the option of an interlaced display for any screens with double (or greater) the normal screen height.
- Tutorial function to help you learn to use Mouse Tricks.

just **£9.95**

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West Bridgford
Nottingham
NG2 7PP

New: Big ST now supports TOS1.4 virtual screens, and a serial mouse driver allows the use of PC mice on the ST.

Going On-Line

The Internet – Some Basics

Mark Baines

Up until now I've devoted most of this column to Bulletin Board Systems and their networks - NeST, TurboNet, FidoNet. When starting out in Comms it is here that most people start, as it's free and there's plenty to keep you busy.

However, although international, these networks tend to be associated with the hobbyist rather than the professional. Most have free access and so the sysop has to bear the brunt of the costs. This, limitations of the types of computers used (micros), lack of strict security and the particular interests of sysops have always placed great restrictions on the scope of most BBS systems and networks. They certainly aren't inviting to the professional.

Whilst the bulletin board networks were developing in the US, various commercial companies, research institutions, universities, colleges and the military were building their own internal computer networks. It was only a short step to link these Local Area Networks (LANs) together with others of a similar nature - one university college building with another, then to other universities, maybe a local research institute and so on. Most of these links were made using leased lines - very fast, dedicated telephone lines between one site and another. In the US, where all this development first took place, these are 56 Kilobits per second lines. Then, longer distance routes carrying more data (1 megabits/s and 45 megabits/s) were installed. These trunk routes can be used by various sites, one computer attached to a LAN logging on to another and its LAN at another site, and so a wide area network (WAN) develops.

One WAN may need to talk to another at some time. Special computers dedicated to the task of being a 'gateway' between networks receives packets of data from one source and converts it into the format required by another network. Before you know it, a network of networks develops - unbounded, unlimited - a cybernet!

Arpanet

In the 1950s after the scare of the Japanese Pacific war and threats to the mainland US, the US Federal government started to build the interstate highway system - a fast transport system that is capable of sending troops across the country as fast as Coke bottles! The same reasoning also caused the US Department of Defense (sic) to develop a network to link military computers together scattered between thousands of bases, depots, air fields, camps, etc. In 1969, the Defense Advanced Research Projects Agency (DARPA) gave birth to the Arpanet. At first, it was an experiment to see if computers could be linked together. Being successful, academic institutions started to use it as it was an excellent way to exchange research material. However, the main military organizations ignored it at first. By 1977 there were a few hundred computers connected into the Arpanet; by the mid-80s, tens of thousands; today, over a hundred thousand - it would be impossible to count.

At first, Arpanet was the backbone connecting scattered universities, military sites and defence contractors together. As the military grew more dependent on it and as the need for advanced security increased, they split off their part of Arpanet into the Milnet but which remained linked with the Arpanet which now became research orientated. However, these sorts of distinctions are hard to pin down. There are gateways between them as between any two networks, so an Arpanet user can connect to the Milnet without any problems. However, Arpanet and Milnet together with all the thousands of other academic, commercial and military networks around the world all make up what we call the Internet. There is no one network called Internet, it is a large "network of networks" with all the regional networks interconnected together in real-time using the TCP/IP protocol suite.

TCP/IP

Today, the TCP/IP networking protocols are the de facto set of communication protocols for transferring data across networks of computers. It stands for Transmission Control Protocol over Internet Protocol and has its origins in the DARPA experiments. Arpanet was using TCP/IP as its main transport protocol by 1974 but what really made it the standard was when the University of Berkeley implemented the DARPA Internet software for it 4.2BSD Unix kernel. The resulting networking code was placed in the Public Domain and as a result practically all Unix machines use TCP/IP.

Once two machines are connected together using TCP/IP additional services are available which includes a virtual terminal session known as Telnet. This allows any computer, even an ST, to act as a terminal for a distant Unix machine. There are a number of file transfer utilities allowing files to be copied from one machine to another, the most common being FTP (File Transfer Protocol). There is the electronic mail transfer service, data routing and the remote execution of applications even using X.Windows (the Unix GUI) so that all the processing, file and memory accesses are done on the remote computer yet you see all the results as if it was all happening locally. Because Unix is a multiuser, multiprogramming operating system, some or all of these services can be run simultaneously.

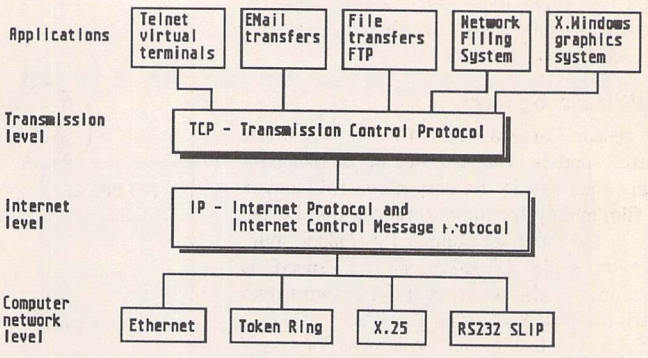
There is a loose association of computers all using the UUCP (Unix to Unix Copy Program) protocol which started out on Unix systems but has since been ported to other mainframe operating systems, such as VMS. This network doesn't operate on a real-time 'live' basis but each computer connects to another at certain predetermined times, say every hour, and asks the host if there are any packets of data waiting to be transferred. Both systems then transfer data (mail, files, etc.) and then disconnect. This is called polling, this 'store and forward' operation being very similar to what bulletin board systems do.

Most UUCP links are made with high-speed modems and using normal telephone lines at, usually, local call rates, perhaps calling into an independent Packet Switching Service, such as Tymnet or IPSS. These are independent companies providing a service, by subscription, of operating high-speed telecommunication links (land lines, satellite, microwave, etc.) across the world. You ring their local node and they worry about transferring your call to wherever you want. There are computer systems making Internet-based UUCP connections doing their UUCP transfers over TCP/IP connections. Here, one computer in a network 'hops' onto another across the world and then transfers their mutual UUCP traffic. Using these techniques, most users can EMail someone else anywhere in the world at local call rates!

Next month, I continue my discussion on the Internet with particular attention to addressing and domains.

EMail:

Internet:
msbaines@cix.compulink.co.uk
FidoNet:
2:259/29.10@fidonet.org
NeST:
90:105/5@nest.ftn
TurboNet:
100:106/0.10@turbonet.ftn



TCP/IP Architecture

Camera Shutter Timer

Background

When I first started using and learning about computers, one of their most publicised possibilities was in the field of control and monitoring. Remember the ZX81 power station control boast in Sinclair advertising? Many people at that time dreamed of controlling their household heating system or greenhouse with their 'micro', and a few bits of expensive hardware were produced and sank without trace.

Because of the additional hardware needed to make use of domestic computers in this way, most people have just opted for the more obvious and cheaper uses of office productivity and leisure. I have always held an interest in using computers for the unusual and enjoy finding ways that they can be used without expensive add-ons. One of my hobbies involves restoring and repairing old cameras. Unlike modern electronic cameras these machines rely purely on springs and clockwork mechanisms to provide the 'precise' timings for accurate exposure control. In time, the clockwork tends to dry up and slow down and the spring tensioning devices tire after many years of use. Whenever I get a new computer, the first thing I do is find a way of implementing my shutter timing system. The actual hardware required is nearly always the same and consists of a sensor panel (Fig 2) containing a photo-transistor, attached to a small circuit (Fig 1) which can be connected to a digital input on the computer. On previous computers the joystick ports have provided a useful source of easily accessible digital inputs. On the ST the joysticks are read through the keyboard processor, making their response limited. The ST printer port 'busy' signal, however, is directly accessible and can be read directly, and so is able to provide a suitable input for the timer.

Although a hardware timing circuit hooked into one of the ST's counter-timer chips would be more accurate, a simple calibrated software loop is usually good enough as it can be calibrated for any particular computer. On the ST, using a machine code timing loop, one can easily time down to 1/1000th second which is suitable for most classic cameras built before the 1980's.

Building a System

The sensor Cameras fall into two types: Iris shutter models, where a set of overlapping petals, mounted in the lens, move to uncover the film evenly for approximately the shutter 'speed', and the more popular focal plane shutter, where the effective shutter 'speed' is governed by the width of a slit between two relatively slow moving 'curtains'.

Each type has its own problems. Because it takes a finite time to open, the iris shutter depends very heavily on the acceleration rate that the blades can maintain. Any friction or tiredness of the springs will bring marked degradation at the higher shutter speeds.

With a focal plane type the slit width must be maintained throughout the travel of the blinds. Any variation will be picked up by a variation in the shutter 'speed' across the film gate. In order to get the best performance from the sensor, its working area must be as small as possible. The slit width at 1/1000 sec shutter speed is quite narrow, but a 1mm hole is usually sufficiently small for this.

For typical 35mm cameras, figure 2 shows a design for mounting the phototransistor in a 50 x 35 mm piece of 3mm thick ply. The mask plate is necessary to limit the angle of view of the sensor so that there is a rapid switch on and off when using it with focal-plane shutters.

Interface circuit

This part is very simple indeed, consisting of a single transistor and a resistor connected to the printer port of the ST. If you are handy with a soldering iron, this can be easily accommodated in the connector cover for a 25 way 'D' connector. The actial circuit is shown in fig. 1.

Software

The timing program can be very simple, but the actual timing loop must be written in machine code for the speed which this allows. For the ST version, I have used the latest version of Hisoft's HighSpeed Pascal which has a built-in assembler rather like the one in Fast Basic of old. The assembly routine could be used with almost any other language if modified to suit. To use the timer, we have to get hold of the printer busy signal which is accessed through the MFP chip at byte FFFA01. Bit 0 of this byte is the actual busy line from the printer and can be read directly, so is ideal for our purposes.

The system can be tested directly by just switching the printer on and off line and watching the transition of the 'busy' line. CHK_BUSY.PAS demonstrates this principle by showing the state of the byte in binary form. As the 'on-line' switch of the printer is activated, bit 0 will flip from 0 to 1 and vice versa. This program is useful for testing the sensor and interface, to make sure it is switching at sensible light intensities. If the sensor does not switch the line when light falls on it, the value of R1 should be reduced until it does. I have found a value of 470 ohms to work quite well.

Once the hardware to access the busy line is working attention can the be transferred to the more useful program TESTTIME.PAS. This code performs the timing operation by starting a count once the busy bit changes. When the timing stops, the routine returns a value to the main program as a long integer value. This value, measured in 'program loops', is not terribly useful as is, so it must be scaled into seconds or milli-seconds. The easiest way to do this is to calibrate the timing loop by running it for 10 or even 100 seconds to find a scale factor in counts/second. This tor can then be used to provide answers from the timer. Other niceties would be the calculation of a 'nearest fraction' value for each reading and a photographic error range measured in 'stops'. Although they are often marked otherwise, camera shutter speeds are arranged in a sensible arithmetic progression. i.e. 1, 1/2, 1/4, 1/8 right up to 1/1024. Sounds very much like computer speak doesn't it?

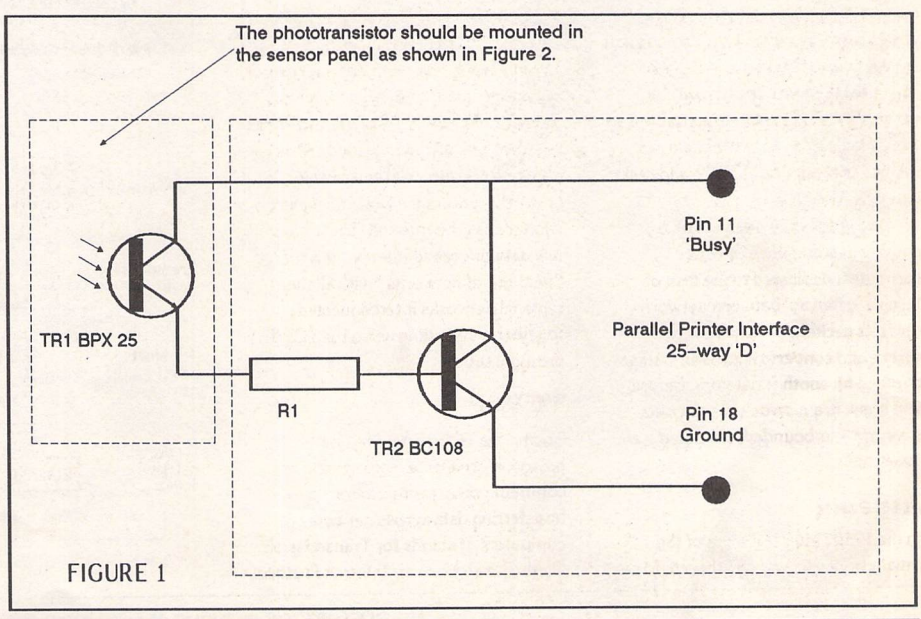


FIGURE 1

If you have an old camera, or even a new one, to try out this system with, please don't be downhearted if the shutter times seem to be way out. Modern films offer an amazing exposure latitude, so a 1/125 shutter speed which measures out at 1/95 is not bad at all.

Other Projects

The printer line is useful for measuring very short duration times. For measurements which do not need such high speed access, the joystick ports provide multiple inputs but programming them via the keyboard processor is more complicated. One project I shall be looking into later on is decoding radio clock signals from the transmitter at Rugby. This transmitter sends out a very accurate time signal every minute. Maplin Elecronics have recently produced a radio receiver and interface which could be connected to the ST. The kit retails for around £20, so you could have GMT piped in to your ST via radio for the price of a real-time clock card!

For measuring analogue signals, the Microdeal stereo-master cartridge offers two channels of 8-bit resolution analogue input. The kit is cheap at £30 odd or £16 if you happen to read Atari ST User. Microdeal thoughtfully provide instructions for reading their analogue to digital converter (ADC) and so its use is not just limited to measuring sound samples through their own software. Obvious measurements could be temperature, light level or movement.

I have just bought one of the Atari Robikits which sadly flopped when they came out a few years ago. This is a remarkable piece of kit with some excellent software and documentation. All for £19.99! We might get to control that power station yet!

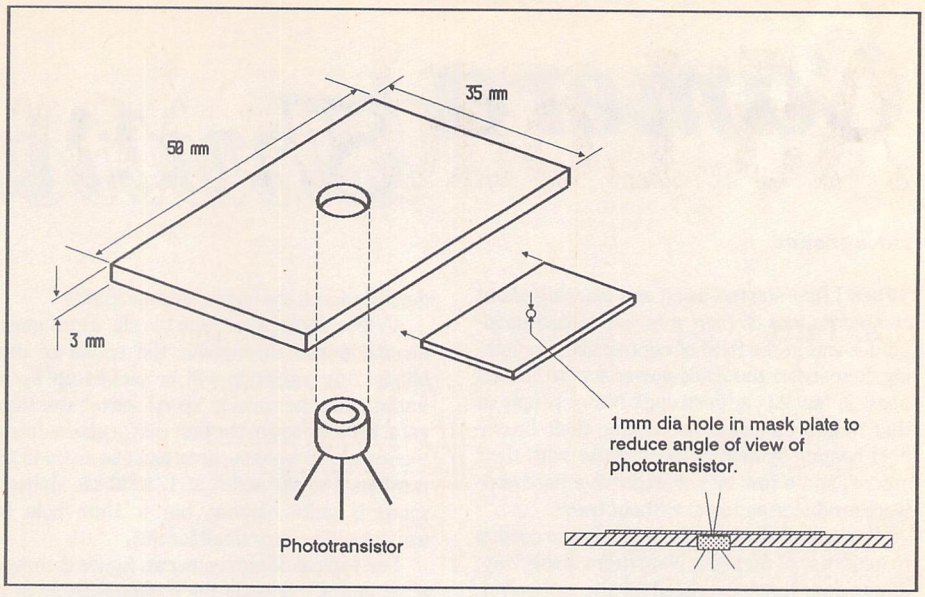


FIGURE 2

```
PROGRAM Chk_Busy;
{-------------------------------------------------------------}
{ Test routine to show the binary representation of the byte at }
{ $FFFA01 of the MFP chip                                       }
{-------------------------------------------------------------}

USES Dos,Graph,UtilUnit, Bios;

CONST
  Forever = False ;
VAR


  Stack_Pointer  : Pointer ;
  Port           : ^Byte   ;
  Value          : Byte    ;
  Driver         : Integer ;
  Mode           : Integer ;

FUNCTION Bin_String( Port : byte ) : string;
{-------------------------------------------------------------}
{ Converts byte value into binary string                        }
{-------------------------------------------------------------}
VAR
   Value      : byte;
   Binstring  : string;
   Position   : integer;
   Bit        : boolean;

BEGIN
   Binstring := '';
   Value := 1;
   FOR Position := 0 TO 7 DO
      BEGIN
         Bit := (Value = (Port AND Value));

         IF Bit THEN
            Binstring := Concat('1',BinString)
         ELSE
            Binstring := Concat('0',BinString);

         IF (Position < 7) THEN
            Value := Value * 2 ;
      END; { FOR Position }
   Bin_String := BinString ;
END;  { of FUNCTION Bin_String }
```

```
BEGIN {---------------Program to test printer busy signal---------- }
  Writeln(Tosversion);
  Driver := DETECT;
  InitGraph(Driver,Mode,'');
  OutTextXY(252,80,'Bit - 76543210');
  OutTextXY(252,90,'      ||||||||');
  OutTextXY(240,150,'Operate <on-line> switch on printer');
  OutTextXY(240,160,'     to see bit zero change');
  OutTextXY(240,180,'     Press any key to exit');

  REPEAT
    Stack_Pointer := Super(NIL)          ;
    Port          := Ptr($FFFA01)        ;
    Value         := Port^               ;
    Stack_Pointer := Super(STack_Pointer) ;

    OutTextXY(300,100,Bin_String(Value));

  UNTIL KeyPressed ;
  CloseGraph;
END. { Printer }
```

```
PROGRAM TimeTest ;
{-------------------------------------------------------------}
{  program 2 to test shutter timing assembly code               }
{                                                               }
{  Graham Curtis - November 1993                                }
{-------------------------------------------------------------}

VAR
  Answer : String ;


Function Timer : LongInt ; ASSEMBLER;
{-------------------------------------------------------------}
{ Assembly language routine to time tha transition on the busy  }
{ line at FFFA01 ( bit 0 )                                      }
{-------------------------------------------------------------}
ASM
       CLR.L   -(SP)            { Enter SuperVisor mode       }
```

A5 Loader for DJ500

R.L. Tufft

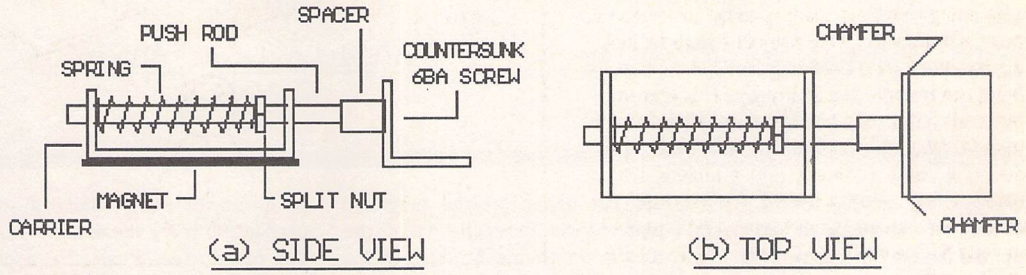


FIG 1. General Assembly

Introduction

The Hewlett Packard DJ500 is a first class printer but suffers, in my opinion, from being unable to handle a range of paper sizes. In the U.K. we are more concerned with A4 and A5 paper, rarely having need to use American letter or legal size, and not being able to auto-feed A5 is frustrating because 'fiddle-loading' single sheets is not ideal. It is possible to load A5 paper in landscape but that renders useless the back-stop slider in the paper loading tray which normally helps to maintain paper in the correct loading position. What is required is a means of auto-feeding A5 paper in the same way as A4 and, most important, without having to carry out any sort of fiddling. The AFIVER attachment to be described satisfies these needs and is easy to make, easy to use, low cost, effective and easily within the capabilities of many DIY'ers. Auto feeding one or two across paper labels is possible so long as you keep within the limitations dictated by the position of the DeskJet paper handling rollers.

In the design of the AFIVER the following criteria were kept in mind:

a) No alterations must be made to the DJ500 unless you're willing to 'kill' the printer's guarantee. This rules out any thoughts of drilling holes.

b) The attachment must be quick and easy to fit and remove and must be effective in use.

c) Whenever possible the several bits and pieces needed should be easily obtainable.

d) Cost must be low.

The above conditions have been satisfied except for (c) which will require a little bit of searching for two particular items. Don't let this put you off; I live in a very small market town which has limited shopping facilities but I had no major problem getting hold of the difficult items. In fact one of the items was given to me as scrap because it had no realisable market value. Most of the components can be considered to be scrap bits and pieces.

Description of the AFIVER

The AFIVER is constructed from thin aluminium sheet, part of a wire clothes-hanger, a small piece of so-called magnetic plastic strip, a short weak compression spring (squeeze not stretch type), a short 6BA countersunk head brass screw, one 6BA brass nut and a short piece of internally 6BA threaded metal tubing. A stack of A5 paper to be auto loaded must be kept firmly against the right hand paper guide (as it is for A4 paper) and to avoid a complicated mechanical arrangement I opted for a spring loaded pressure plate which is positioned and 'fixed' with what is known as magnetic plastic; essentially this is a thin sheet of plastic which has an embedded magnetic layer on one side and a piece about 25mm x 32mm provides adequate holding capabilities. This magnetic plastic comes complete with a self adhesive coating on one side which enables it to be fixed to the AFIVER main assembly. It's unlikely that you'll be able to buy the magnetic plastic direct from the manufacturer but many shops which offer Vinyl Letter Signs use the same material and the piece you require is small enough to be classed as a waste off-cut. The other problem item is a small weak compression spring for which full details are provided later.

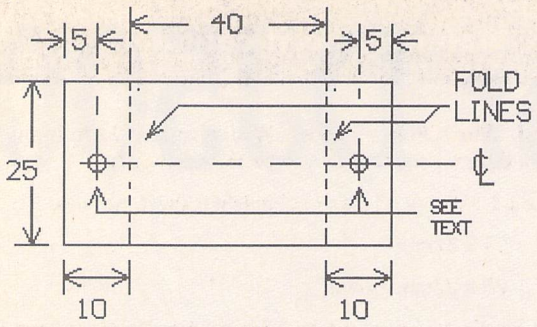
The general arrangement is shown in Fig 1. The main CARRIER is made from 1.5mm thick aluminium strip - use what is known as 'half-hard', so that it can be easily folded (bent). The PUSH-ROD is made out of a piece of wire cut from a wire clothes hanger and needs to be 2.6/2.7mm diameter so that it can be threaded 6BA at one end. The threading might be a problem if you do not have a suitable 6BA die for cutting the thread but most small engineering shops will cut the thread for a nominal charge.

The SPACER is a piece of tube or hexagon, 6mm long, which has an internal 6BA thread. If you have a piece of suitable material and the necessary 6BA tap then it can be made in a minute or so. Failing that most radio component dealers should be able to supply a '6BA stand-off pillar' which is a very common component. Make sure that you obtain a metal pillar not plastic. The SPRING should be about 25mm long and have an inside diameter slightly larger than the push-rod diameter; its main specification is that it should have a spring rate of about 50 grams per centimetre - let's clarify that statement. Spring rate is the amount of force which must be applied to a spring to compress it by a given amount and a spring with a rate of 50grms per cm will compress one cm for a weight or force of 50 grams or two cms for 100 grams force. With that out of the way let's get the spring organised. A model shop should be able to supply but, in my experience, they rate their springs as 'weak' or 'strong' so you must have a quick and easy way of estimating that you have the correct strength spring. (The strength of the spring which closes the protection plate on a floppy disc is about the strength you will need, so use that as a guide. Don't be tempted to use a spring out of a ball pen because it'll be much too strong.

The 'split nut' can be replaced with an external circlip but it's much easier and just as effective to use a 6BA half-nut (that's a nut having half the thickness of a normal nut, often referred to as a lock-nut).

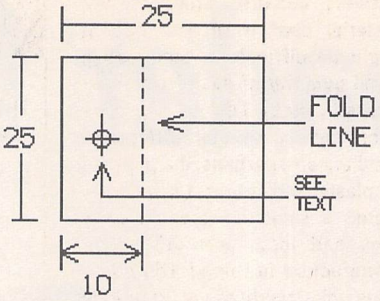
Construction

Prepare the push-rod. Cut off a length of rod, about 60mm long and thread one end 6BA for a length of 15mm or so. Then cut off part of the thread with a hack saw so that you're left with the rod with a short length of thread 3mm long. (The reason for cutting off some of the thread is that it is difficult to ensure when cutting a short thread that it finishes up true and not lop-sided. By making it longer than necessary the die will be able to straighten itself up and



MATERIAL: 1.5mm Aluminium

FIG. 2



MATERIAL: 1.5mm Aluminium

FIG. 3

give you the desired result). After cutting off the excess thread clean up the end with a few light file strokes.

Main support

Mark out the size of the aluminium strip as shown in Fig 2 and

cut to size using a hack-saw; do not use tin-snips because you'll end-up with a twisted piece of metal. Clean-up the cut edges with a smooth file or emery paper making sure that all the finished edges are square relative to each other. Now, you must start to be as accurate as possible.

The push-rod you have made should be 2.6/2.7mm in diameter so get yourself a drill bit very slightly larger (e.g. 3mm) - don't go too big or the push-rod will be a sloppy fit. If you're particularly good at marking out and drilling then you can settle for a clearance drill size; if you don't understand what that is then go for the drill described as 'slightly larger'.

Use a scriber to mark out the position of each hole in the main support carrier, centre pop and drill the holes. Deburr the holes. Position the carrier in the vice jaws so that the scribed bending line is flush with the vice jaws, the longer length of the plate being above the vice jaws. Use a piece of wood between a small hammer and the carrier and tap over for a right angle bend. Turn the carrier over in the vice, line up the other bending line and tap over again. If all is well you should now have a channel shaped piece of aluminium. Slide the push-rod through the holes to confirm that it slides easily with only a small amount of side-play.

Place the carrier on the piece of magnetic plastic, mark around carrier with a pencil or ball point then cut to size using a scissors or Stanley knife. Clean up the edges and corners of the carrier, strip off the paper on the magnetic plastic and carefully stick the plastic on to the bottom of the carrier. You now have to make the aluminium angle piece.

Mark-out a piece of aluminium as shown in Fig 3 but DO NOT mark or drill the hole. Bend the aluminium in the vice but this time use use the hammer directly on the aluminium (don't use the wood for protection). What you want is a sharp bend and the action of hammering, not too hard, will give you that. Now you have to be very careful once more. Clean up the edges of the angle piece then place the carrier on a flat piece of metal - a metal rule is ideal - the magnetic plastic will hold it in position. Place the angle piece up against the carrier with the hammered side vertical then insert the drill, used to drill the carrier, through the carrier holes so that its cutting end touches the angle piece. Hold the assembly firmly with one hand then turn the drill bit by hand several times and, hopefully, when you look at the angle piece you'll see a clearly marked area made by the drill. Centre punch the position and drill using a 2.7mm drill. Next partly countersink the hole (see fig 1a which indicates which side of the bracket to countersink) but remember that the material is very thin and if you're not careful the drill will bite and pull itself through the hole and ruin the angle piece. Don't try to fully countersink the hole, just do it enough so that when the countersunk screw is inserted it's head is not fully flush with the angle piece. Attach the threaded spacer to the angle piece using the countersunk screw and lightly tighten. Give the assembly a careful examination to make sure everything looks O.K. Screw the push rod into the free end of the spacer and again lightly tighten. Slide the push-rod through the holes in the carrier and place the assembly on the metal rule. Push the angle piece to and fro to confirm that it slides freely without dragging on the rule. It doesn't matter if it is touching the rule so long as it doesn't jam when slight additional pressure is applied to the channel piece. If all's well unscrew the push-rod from the spacer.

Hold the 6BA nut in the vice and use a junior hack saw to cut half way through the nut, see Fig.6. Check that the nut screws on to the end of the threaded rod then remove it.

Final assembly can now commence. Insert the push-rod, threaded end first, through one of the channel holes. Slide the spring, which should be about 25mm long, on to the push rod then screw the split 6BA nut on to the push-rod thread. You'll have to hold the spring slightly compressed to carry out the operation. When the thread on the push-rod end comes through the nut feed it through the other hole in the channel. The assembly will now keep itself in position. Clamp about 10mm of the unthreaded end of the push-rod in the vice and start to screw along the split nut. Eventually it'll reach the end of the thread and come up against the unthreaded part of the push-rod. Continue to turn the nut which will 'climb' off the thread on to the plain part of the rod. Carry on turning until it is about 10mm clear of the thread. Dismantle the screw and spacer on the angle piece. To reduce the possibility of the screwed pieces coming loose apply a spot of varnish (nail varnish is ideal) to the push rod thread and screw on the spacer tight. Re-fit the angle bracket with the screw using a spot of nail varnish and tighten securely but DON'T OVER-TIGHTEN because the angle piece is thin metal. You should now be able to push the angle piece towards the carrier piece against the spring pressure. Adjust the position of the split nut on the push-rod until you have about 6mm total movement of the angle piece then cut off the surplus length of push-rod leaving about 6mm protruding from the carrier when the angle piece is in its normal extended position. The screw head fixing the angle piece is still slightly proud so carefully file it flush with the angle piece face and at the same time lightly chamfer the two upright edges of the angle piece. See Fig.1b.

Paper Rear Stop

Make another angle piece to the dimensions shown in fig 5 but note that it needs to be 1mm thick material otherwise it might be too tight a fit under the DeskJet's paper back-stop slide. Check that the material to be used slides easily under the DeskJet's slide. It is best to fit this to the right of the existing centre guide groove. The shorter side should be fitted under the slider plate.

Testing

Position the AFIVER near the front left hand front corner of the DeskJet's metal paper tray with its rear edge level with the groove in the DeskJet's metal paper tray and then insert a stack of A5 paper (50 sheets or so) making sure that the stack is pushed fully forward and also aligned with the right hand paper guide in the same way as when using A4 paper. Slide the AFIVER unit so that the angle piece sits under the stack of paper with the upright part of the angle piece exerting light pressure on the side of the paper. Push the slider panel forward so that the angle piece is just touching the stack of paper. It is essential that you install the DeskJet's paper top-delivery tray because it plays an essential part in correct paper handling.

You're now ready to start testing. Set-up your software for printing a dummy run of about twenty blank sheets and away you go.

Problems

If you've made the unit correctly you should have no problems, but if you do have any then carry out a few simple checks:

1) Remove the A5 paper and check that the AFIVER's angle bracket is able to slide freely and is not fouling or jamming on the

DeskJet's metal paper tray.

2) It is essential that the AFIVER is positioned correctly otherwise it'll interfere with the rise and fall of the metal paper tray which helps correct paper handling. The unit must not overhang the groove in the metal paper tray.

3) Is the tension spring correct strength? It should present about the same strength as the normal A4 paper edge pressure plate. If it's too strong paper feed might be erratic. If it's too weak then paper might become mis-aligned. Move the AFIVER unit to the left or right to reduce or increase respectively the side pressure on the paper stack. If more than a sheet at a time gets loaded then check the paper stack which might have undue width variations, particularly if you're using paper which is your own cut-down A4. The DeskJet is 'touchy', even with A4 paper, if the sheet sizes vary in a stack of paper.

Final testing

Load a known number of sheets, say 50, then set-up your software to print 50 blank sheets without page numbering - why waste paper? Start your printing routine and let the printer run. Failure to pick-up a sheet or picking up two sheets will be evident during or after the test run.

Conclusion

The foregoing might sound complicated but the average DIY'er should have no real difficulty so long as he/she has a little patience to work accurately. I have made and tested several different versions and all worked successfully but the version offered here would seem to be the simplest to make without undue problems in getting hold of the necessary bits and pieces. Cost? Difficult to answer, because although the material used is of low cost it might be difficult to buy such a small quantity of each item. Fortunately, many DIY'ers will probably have the required items to hand except, perhaps, the magnetic plastic and spacer. I have contacted a small local engineering shop and they have offered to manufacture in lots of 100 complete units, ready to use, at a price which will enable me to pass them on to anyone interested for £3.65 each which includes post and packing. If only a few persons want one then it's 'hard luck'. I suggest that those who are interested write to me at the address given at the end of this article - sending no money but including an SAE for reply - and if numbers are sufficient then I'm prepared to place an order with the local engineering shop who have assured me that delivery of a 100 can be made in 14/21 days of giving them the go-ahead. The ball is now in your court.

Warning

If the AFIVER is made correctly then you should have no problem but neither the author nor the ST Club has any control over the quality of construction or how it is used so the responsibility is yours alone. The design described has been used with A5 paper for an estimated 2000 sheets and failure rate (picking-up two sheets at the same time) is less than 0.5% which compares favourably when using the DeskJet with A4 paper. Finally, since the device uses a magnetic material you must ensure that you do not allow it to come into contact with discs or any other magnetic storage medium - unless you like corrupted discs!

Material Specification

1) Push-Rod. Wire Clothes Hanger. Wire diameter 2.6/2.7mm. Not less than 60mm long. One end to be threaded 6BA.

2) One piece 50 x 25mm of 1.5mm aluminium sheet, half-hard.

" " 25 x 32mm " " " " "

" " 25 x 32mm 1.0mm " " " "

3) Magnetic Plastic. 25mm x 30mm) 1.5mm thick. (Material 2mm thick if offered as an alternative can be used).

4) 1-off 6BA brass half-nut (this is a nut having half the thickness of a standard nut). A full nut (standard thickness) can be used if preferred.

5) Threaded 6BA spacer. Metal not plastic. Length 6mm nominal.

6) Compression spring. Rate 50 grams per cm. Length 25mm.

7) 6BA Brass Countersunk Screw. Length 3mm.

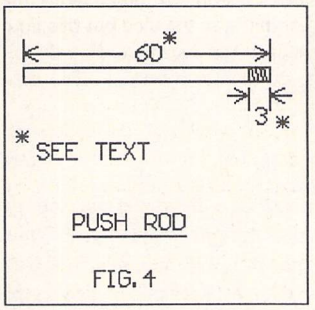


FIG. 4

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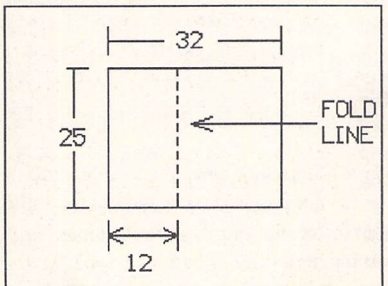

FIG. 5

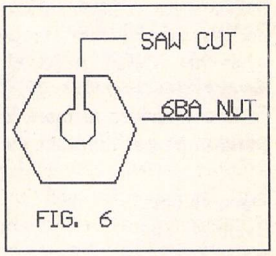

FIG. 6

```
        MOVE.W  #$20,-(SP)
        TRAP    #1

{* We are now in supervisor mode)

        MOVE.L #$FFFA01,  A0    { Address of busy signal      }

@Close: MOVE.B (A0),D1          { Get printer byte from port  }
        AND.B    #1,D1          { Test for bit 1 = 0          }
        BNE @Close              { Shutter closed so loop back }

{* Shutter has opened. Let's start counting)

        MOVE.L   #0,D2          { Zero our counter }
@Open:  MOVE.B (A0),D1          { Get byte from port }
        ADDQ.L   #1,D2          { Increment counter  }
        AND.B    #1,D1          { Test for bit 1 = 1 }
        BEQ @Open               { Shutter Open so loop back }

{* All done so let's go back to Pascal }

        MOVE.L  D0,2(SP)        { Exit SuperVisor mode }
        TRAP    #1
        ADDQ.W  #6,SP           { Cleanup stack }

       { Back in 'User' mode }

        MOVE.L D2, @result   { Move count to D0 for USR routine }
END; { Timer }


BEGIN
  {----------------------- Main Program -----------------------}
  {------------ To output results from timer code -------------}
  ClrScr  ;
  REPEAT
    Writeln ('Time = ',(Timer/386800):4:4, ' Seconds');
    writeln ;
    write('Again y/n ?');
    Readln(answer);
  UNTIL (Answer <> 'y') AND (answer <>'Y')
END.
```

Beginners' Forum

Number Bases – Part 1

Mark Baines

It is often taken for granted by writers that readers understand references to the various number bases 2, 8, 10 and 16 or binary, octal, denary (decimal) and hexadecimal. My experience is that this isn't so, especially older readers who never studied this sort of maths at school (if you can remember that far back – not sure I can!).

Back to basics

Let's start by looking at the system we know best, the denary system or base 10. Here we have ten characters or digits representing discrete units and having values from zero to nine – hence 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. One of the most important things to understand here – especially when we go on to the other bases – is what happens when we want a number greater than nine, as we have no more characters left. Well, we simply go back to zero again, but because we have gone through the sequence once, we put a '1' in front of the zero to signify that. Thus, the '1' represents one sequence of ten and therefore the denary number representation of '23' means 2 tens and 3 units.

In these number systems all digits therefore have a place value and its place affects its value. In '23' the '2' doesn't have a value of two but a value of two tens and hence in denary moving to the left one position at a time increases the place value by ten. So,

Place values	10^2	10^1	10^0
Decimal value	hundreds	tens	units
Denary number	2	5	5
	$2x10^2$	$5x10^1$	$5x10^0$
	200 +	50 +	5 = 255

OK, we all know that, but what most people don't know is that this reasoning is also the foundation for every number base we care to think of, be it base 16 or base 3,825!

Binary

Base 2 number representation is common in computers because of the way that most circuits can only represent two states, on and off, or high voltage and low voltage symbolized by us as one and zero.

Here, we have a system using just two digits, 0 and 1 and where the place values increase with the powers of two. We start at 0, then 1. After that we start at zero again but place a '1' in front to show we have been through the series of digits once, giving 10 meaning 1 times two and no units. The sequence (in binary) is therefore 0, 1, 10, 11, 100, 101, 110, 111, 1000...

One problem that arises when talking about different base systems is that the reader can be confused as to which number base a number belongs. Take 110. Is that binary for six or one hundred and ten in denary? To prevent this confusion it is customary to represent the number base as a subscript to the number e.g. 1101100_2. Where no subscript exists we assume base ten unless otherwise stated. Programmers also represent binary numbers with a '%' character (looks like 010), octal numbers with a '@' (looks like 'o'?) and hexadecimal numbers with a '$' or '&', e.g. %11011, @33 and $1B.

Place values	2^6	2^5	2^4	2^3	2^2	2^1	2^0
Decimal value	(64)	(32)	(16)	(8)	(4)	(2)	(1)
Binary number	1	1	0	1	1	0	0
Conversion	$1x2^6$	$1x2^5$	$0x2^4$	$1x2^3$	$1x2^2$	$0x2^1$	$0x2^0$
in denary	64 +	32 +	0 +	8 +	4 +	0 +	$0 = 108_{10}$

To convert any binary number to decimal do as above. Write down the binary number and then the powers of two above each binary digit starting at the right-hand or least significant digit (LSD). Add up all those powers of two where a binary '1' appears below it.

Converting decimal numbers of binary is a little harder. The best way is the 'repeated division by two' method. To convert 108 to binary:

108 ÷ 2 =	54	remainder 0	(LSD)
54 ÷ 2 =	27	remainder 0	
27 ÷ 2 =	13	remainder 1	
13 ÷ 2 =	6	remainder 1	
6 ÷ 2 =	3	remainder 0	
3 ÷ 2 =	1	remainder 1	
1 ÷ 2 =	0	remainder 1	(MSD)

We then take the column of 'remainders' making sure that the topmost one is the least significant right-hand digit and the bottom one the left-hand or most significant digit (MSD) – giving a binary number of 1101100_2.

Binary has the disadvantage that most numbers form long cumbersome strings of ones and zeros. In the above examples denary 108 consists of three digits whereas its binary equivalent has seven digits. To handle binary numbers more easily two other number bases are more frequently used, octal and hexadecimal. These are number bases based on powers of two – eight and sixteen.

Octal

Octal is base eight and uses the symbols 0, 1, 2, 3, 4, 5, 6, 7 to represent its numbers and, as always, the place values increase by powers of the base i.e. eight. So what comes after 7_8? Again, you start once more at zero and put a '1' in front to signify that you have gone round once. So after 7_8 comes 10_8 meaning 1 times eight and no units, the sequence (all in octal) being 0, 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16, 17, 20...

Place values	8^2	8^1	8^0	
Decimal value	(64)	(8)	(1)	
Octal number	1	5	4	
Conversion	$1x8^2$	$5x8^1$	$4x8^0$	
in denary	64 +	40 +	4 =	108_{10}

Again, this is the way to convert octal numbers to decimal. Write down the octal number and then the powers of eight starting at the right above it. Think along the lines of the denary system. Instead of powers of ten, it's powers of eight – that's all, and remember there's no '8' or '9' digit.

Converting from denary to octal uses the same repeated divisions method, but this time by eight.

```
108 ÷ 8 = 13   remainder 4 (LSD)
 13 ÷ 8 =  1   remainder 5
  1 ÷ 8 =  0   remainder 1 (MSD) = 154₈
```

As mentioned above, eight is a multiple of two, 2^3 in fact. Octal is therefore used as a shorthand for binary and an easy way to convert between the two is to use the following table:

Octal	0	1	2	3	4	5	6	7
Binary	000	001	010	011	100	101	110	111

Now, take the octal number 154_8. Using the table above you write down the three-digit (because eight is 2^3) binary equivalent of each octal digit, so:

Octal	1	5	4
Binary	001	101	100 = 0011011002 or 1101100_2

Binary to octal is the same. Convert 10101011010112 to octal. Divide the binary number into groups of three starting from the right or LSD. If necessary, add leading zeros to the left-most group.

Binary	001	010	101	101	011	
Octal	1	2	5	5	3	= 12553_8

Hexadecimal

Now things get interesting. Again, with large numbers octal is no better than denary when it comes to long strings of characters. Indeed, 10810 has the same number of digits as 153_8. The hexadecimal number representational system has the capacity to display numbers with fewer digits as it uses a base greater than ten.

You will realise by now that each place value in hexadecimal rises by a power of sixteen and that we need sixteen digits to represent the numbers. Sixteen? But we only have 0 - 9 available. We have to use other symbols representing digits larger than nine and so use the letters A to F. Don't let this confuse you, these symbols could have been anything but all that was available on early computers was the alphabet. The first sequence is therefore, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F where F is equivalent to decimal fifteen. And after F comes what? Yes, 10, signifying that we have gone through the series once and started again at zero. So, we can continue the series:

Hexadec.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hexadec.	10	11	12	13	14	15	16	17	18	19	1A	1B	1C	1D	1E	1F
Decimal	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Hexadec.	20	21	22	23	24	25	26	27	28	29	2A	2B	2C	2D	2E	2F
Decimal	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

and so on...

To convert a hexadecimal (hex for short) number to decimal we put the powers of sixteen in columns with the hex number below in the same way as before:

Place values	16^2	16^1	16^0
Decimal value	(256)	(16)	(1)
Hex number		6	C
Conversion		$6x16^1$	$Cx16^0$ ($12_{10}x16^0$)
in denary		96 +	12 = 108_{10}

To convert a decimal number to hexadecimal we again use the repeated division method.

```
107 ÷ 16 = 6   remainder 12 = C in hex (LSD)
  6 ÷ 16 = 0   remainder  6 (MSD) = 6C₁₆
```

It's the same as any other base except that any remainder greater than nine has to be converted to the equivalent character that represents it in hex. So the remainder of twelve is 'C' in hex.

Conversions between hex and other bases are best done through binary and using a table similar to that for octal. Here, because hexadecimal is base sixteen and sixteen is 2^4 we use groups of four binary digits.

Hex	0	1	2	3	4	5	6	7
Binary	0000	0001	0010	0011	0100	0101	0110	0111
Hex	8	9	A	B	C	D	E	F
Binary	1000	1001	1010	1011	1100	1101	1110	1111

Converting $6C_{16}$ to binary and octal:

Hex	6	C
Binary	0110	1100 = 01101100_2 or 1101100_2

Then binary to octal as above:

Binary	001	101	100	
Octal	1	5	4	= 154_8

Convert 1101001011000111112 to hex:

Binary	0011	0100	1011	0001	1111
Hex	3	4	B	1	F = $34B1F_{16}$

It might be worth your while constructing a table of decimal, binary, octal and hexadecimal numbers from 0 to 255_{10}. This will give you practice at some conversions, but after a while you will see the patterns emerging and once you have grasped that you will have a higher level of understanding of these 'computer numbers'.

Send me a letter or EMail with ideas for future articles. Thank you for the letters received so far. Although I can't promise to respond to all personal queries, I'll do my best if a SAE is enclosed. You will also find me on CIX and the NeST, TurboNet and FidoNet BBS networks where this magazine is supported.

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STA support in ATARIST echo

TurboNet: 100:106/0.10
STA support in T_ATARIS echo

DESKTOP DISCUSSIONS

New Beginnings

With the launch of the Jaguar, Atari's continued commitment to the personal computer market may be under scrutiny. William Hern argues why the company ought to stay in the market.

As I write this column, the midnight oil is being burned at the Atari headquarters in Sunnyvale as the final preparations are made for the commercial release of the Jaguar games console. The company desperately needs a hit product and is pulling out all the stops for the Jaguar. Every other project is secondary for the moment.

While this short term concentration on the Jaguar is understandable, there are signs that the company has decided to refocus its long term product strategy and concentrate on the video games market. Next year's sale predictions show that Atari expect to make eighty percent of their income from the Jaguar and cartridge sales. This means that for the first time in nine years, in fact ever since it was launched, the ST is not the core product in Atari's plans.

While I would like to see the Jaguar succeed (if it doesn't then there probably won't be an Atari) I'd hate the company to turn its back on personal computing. Over the past couple of years we've seen the number of manufacturers of alternative computers to the PC and Mac steadily decrease and Atari leaving the scene would be another major blow to the discerning micro user who values having a variety of choice.

There are plenty of good reasons why Atari should stay in the field. For a start, it would be dangerous for the company to have all its eggs in one basket and depend on the Jaguar for all its revenue. A downturn in the console market could place Atari in an even worse position than it is in today.

That downturn is not unlikely. The console market has continually cycled between bust and boom over the past fifteen years. From the explosive growth in the late seventies/early eighties (when the Atari VCS dominated) to the slump in the mid eighties that almost wiped out the market altogether through to the resurrection in the nineties and the domination of Sega and Nintendo, the sector could hardly be described as stable. OK, so the Sega cartridge "Sonic the Hedgehog 2" did gross more than any Hollywood movie released last year - but how long will this boom last?

What Atari needs is a spectrum of products so that if one fails, the others can continue to support the company. The Tramiel family ought to know this lesson better than most. Back in the seventies, the Tramiel controlled Commodore took in almost all of its revenue from the sale of desktop calculators using chips bought in from Texas Instruments. Suddenly TI woke up to the size and lucrativeness of the calculator market, decided to enter it itself and understandably became rather less enthusiastic to sell chips to what was now a competitor. This change in market forces almost wiped Commodore out and the company was saved only because of a talented designer by the name of Chuck Peddle and a computer called the PET 2001.

The home business/leisure computer market is an ideal market to act as an insurance policy for Atari. For a start it has shown steady growth over the past five years. In Canada, where I am currently on assignment, the home business market grew by thirty five percent in 1992 and is now worth more than $730 million. That's bigger than the small business market and a sign of the growing importance of this sector. Figures for the United States are similar and Britain is showing signs of following the trend. With more people taking up teleworking and choosing to work part-time from home, this market is likely to grow for the foreseeable future.

A sure sign of the market's potential is the number of large PC manufacturers who are now releasing machines specifically targeted at the home user. One is Compaq who have just introduced the Presario series. For two thousand dollars you get a fast 486SX processor, four megabytes of memory, a colour monitor, a two hundred megabyte hard drive and several pieces of application software including word processor and database. What makes the machine unusual is that it can double as fax and telephone answering machines thanks to its built-in modem. A CD-ROM drive can also be easily attached.

The key point to make about the Presario is that Compaq isn't selling it as a stand-alone system. It is designed to be part of the communication system and integrate into the home. Users aren't just buying a computer - they're getting a fax machine, an answering machine and something they can write letters on.

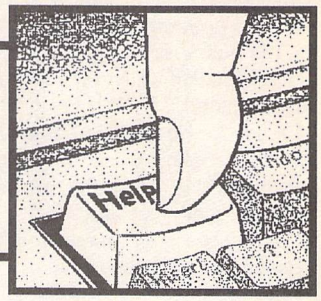
Wherever you look there are machines being introduced which have enhanced communication abilities. Apple's new Centris 660AV and Quadra 840AV machines can, in addition to acting as fax and answering machines, display video pictures from a variety of sources in a window and record and play compact disk quality sound. They also have voice recognition/synthesis abilities.

These machines are positive proof that to be a success in tomorrow's micro market, you need to design a computer which can interface with the other systems in the home. Atari, please take note. The Falcon is a powerful computer but that's all it is. The Falcon may indeed have been the first affordable micro to include a DSP chip but other manufacturers have now caught up and are offering systems with far greater network ability. It will be an uphill struggle for Atari to regain its edge.

I've said it before (Desktop Discussions August '91) and I'll say it again now - Atari need to design a new machine from scratch. Maintaining compatibility with the ST is just too large a millstone. A computer designed from the ground up and taking advantage of the latest processor technology and design techniques could be as radical as the ST was back in 1985. The operating system could be designed so that audio/visual facilities were a core resource, rather than merely tagged on as they are in most system of today.

For the last ten years Atari has been fighting its games image. One of the reasons that the ST didn't become a major player in the business market was that buyers couldn't take seriously a machine that came from, as they saw it, a video games company. Now Atari has returned to its roots. The Jaguar is a fine machine and is more than a match for any other console on the market today. My hope is that the profits from the Jaguar operation will be ploughed back into developing the next generation of home computer, one that is as ground breaking as the Jaguar console is.

FORUM



New Word

John Stean – Forum STA 34
Huw Williams – Forum STA 35
Alan Kennedy – Forum STA 36

I Thanks to Alan Kennedy for the tip. I knew that Chameleon was good but I would never have guessed that some accessories actually prefer this way of being loaded!

John Stean

Textstyle Trouble

Q With Textstyle loaded I select one of the supplied TS files and then save it as an IMG picture file – OK so far. Then I quit the program and load Publisher 2. Now I load the GEM (IMG) picture that I saved. Fine, it loads and prints.

If on the other hand I load Textstyle and select Text in order to make an image file containing my name, enter my name, choose a font (say Century 24) from the supplied fonts, style it, save a TS file for future use and also save a Textstyle image file, then try to load the image into Publisher 2, all I get is an error message: "Graphics import failed: could not interpret file format".

To save my sanity can you please suggest what I am doing wrong, or preferably send me instructions in plain junior language on how to use my own entered text and then style it and load into Publisher 2 as an IMG picture file?

G J Doodson

● You have missed out a step in the manual! Before saving an image you should use the Adjust option in the Size menu in order to reduce the size of the page (and so the image file). The default Textstyle page size is an A4 page at 300dpi – if you save all of this as an IMG file it will have an (uncompressed) size of over 1MByte. The disk file will look deceptiveley small, but, as you have discovered, programs like Publisher take a strong dislike to very large images. Imagecopy will happily print these large image files. To avoid a recurrence of this problem it would be useful to reduce the default page size to something more in keeping with your typical requirements, say 6" wide by 1" deep for single titles and headings, then adjust as necessary.

PC vs Atari

Wendy Durham – Forum STA 24
Alan Kennedy – Forum STA 24
Stephen Murgan – Forum STA 24
Gordon Carruthers – Forum STA 26
Dave Ansell – Forum STA 30
Alwyn Thomas – Forum STA 31
Bob Osola – Forum STA 31
K S Grings – Forum STA 31
Graham Curtis – Forum STA 32
Dave Ansell – STA 36

I As a long-standing subscriber to ST Applications (and to the original Newsletter) may I be permitted a few words of criticism.

I look forward to ST Applications each month particularly for news, reviews and comments from other ST and Falcon enthusiasts. In recent months I feel that too much space (particularly in Forum pages) is being given to those who are deserting the ST/Falcon scene. Why do these people feel the need to bore and annoy the rest of us with their excuses for buying PCs and MACs – and more to the point why do you continue to print these letters?

One would have to be a fool not to realise that the Atari scene is in a depressed state at the present time but I certainly don't expect to be constantly reminded of this fact in what is supposed to be a magazine for Atari enthusiasts – not PC defectors.

It is not just the Forum section which is displaying this trait. Recent reviews of Screenblaster, NVDI and SVGA monitors also took every opportunity to criticise Atari and the Falcon. I am not suggesting total bias, but ST Applications should be a bit more positive and upbeat and promote the many good things about the machines.

Paul Kelly

● Yes, the anti-Atari monologues have been brought to an end. Only funny, useful, or short submissions are welcome on this topic. But, how well the latest hardware from Atari matches up to the competition is (was?) of pressing concern to ST users looking to upgrade from existing 16-bit technology from Atari. It's difficult to be upbeat about the Falcon when, having promised to ship 7,000 units by Christmas 1992, Atari may – according to informed estimates – fail to ship anything appproaching that number by December 1993! Not that we should be confusing support for Falcon users with support for Atari and the Falcon.

Shopping List

Gary Coxhead – Forum STA 36

I I was recently thinking along similar lines to Mr Coxhead and, knowing that I could not afford a hard drive or Falcon, looked at various programs and upgrades which would enhance my system. After much thought I decided to 'upgrade' with a refurbished STE (currently on sale from First Choice for about

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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 condiderable 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.

Key:

The following codes are used for each Forum entry:

J Pringle – Forum STA 20: Author who first raised the subject, and in which issue.

Q Question

A Answer

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

● Editorial reply

£110). This route offers:
a) A form of multi tasking whereby two programs can be run independently. In some cases midi data or text can be exchanged between programs via midi or serial ports.
b) The ability to peruse a Read Me or other documentation whilst the main program is up and running.
c) A use for my old 256k Simms.
d) The possibility of networking the two machines, e.g. using the second disk drive from the main machine.
e) A way to run programs in different screen resolutions simultaneously.
f) Use incompatible cartridges, if necessary.
g) A way to use a large number of accessories on the second ST and for formatting, copying etc to be background operations, also freeing up memory for the main program.
h) A back up for programs with a shaky UNDO facility.
i) A standby machine in case of a breakdown.
j) A small boost for Atari sales.

Bearing in mind Mr Coxhead's description of his "poor old thing" I think that the present price level of the ST makes it a suitable choice. He would also have a modernised TOS.

John Stean

● Sounds daft, but at that sort of price an STe is cheaper than many 1MByte printer buffers!

Mac vs ST

I I have a real Mac Classic, and Spectre GCR linked with a Mega ST and a Megafile 44. With Warp 9 or NVDI 2.11 installed before launching Spectre, it's amazing to see the difference between the two machines when you want a directory tried by names. It's very slow with the Mac and works quite instantly with Spectre!

Herve Maire

Testing DMA Chips

David Bradley – Forum STA 35

A "Atari have never supplied DMA chips and will not supply them to owners to fit themselves."

This is plain simple wrong. I have a receipt to prove it.

According to Atari there were only 300 such machines produced. I've seen all 300 which is quite a coincidence. Get irate mister Bradley...

Adam, CIX 554

I That's odd as I have also seen those same 300 machines. :-) ATB

T Campo, CIX #556

A The STE medium resolution problem referred to by L Upton and Dave Bradley sounds very much like the TOS 1.6 bug where it is incapable of saving the medium resolution setup to the DESKTOP.INF file and subsequently booting into medium resolution. This was cured with TOS 1.62 and TOS 1.6 users can use the Atari patch program for the AUTO folder called STE_FIX.PRG.

I can't imagine that this particular problem has anything to do with the DMA chip.

Mark Baines, CIX 561

SuperBoot

Alan Kennedy – Forum STA 36

A SuperBoot allows you to select from up to nine different DESKTOP.INF files which are saved under the filename of your choice in a separate folder (typically C:\AUTO\SUPERBT), and written out as DESKTOP.INF in the root directory of drive C, overwriting any previous DESKTOP.INF that you may have saved from the desktop.

The trick is to remember to copy any newly saved desktop to the folder with a suitable name e.g. TERADESK.INF. That is to say: copy C:\DESKTOP.INF to C:\AUTO\SUPERBT\TERADESK.INF. When SuperBoot next runs you can select TERADESK.INF, or any of the other eight .INF files, which will be written as DESKTOP.INF in the root directory. This is not too easy using the Atari desktop, as there are so many windows to open and you can never remember where the .INF files are supposed to end up! Mr. Kennedy, and others in the same boat, may find it easier to use a little program I have written to automate the whole procedure. I have enclosed CopyDesk.PRG, which could perhaps be added to the ST Club library (disk DMG.38), which allows you to give the file a new name and remembers where it is supposed to go, after you've told it the first time.

Geoff Wilson

Mouse Problems

Huw Williams – Forum STA 35

A I have also used a 'Speedmouse' on my Falcon and found that the pointer has a tendency to move to the side of the screen by itself, which is most disconcerting. I obtained a replacement from Ladbroke Computing but found this exhibited the same behaviour. Thinking that the problem may lie with my Falcon I tried the mouse on my ST – same results, but less frequently.

I have reverted to using the original Atari mouse recently and have had no problems so I suspect the Speedmouse is at fault. Has anybody any views on which is the best mouse for ST/Falcons and what are optical mice like to use?

Paul Kelly

A I had a similar problem and tried two or three different mice. I had a real saga with a piece of hardware which was meant to connect a PC keyboard to the ST and provide nice new mouse holes for those clapped out on the ST – it didn't work and my mouse got more and more erratic. And I got more and more desperate.

My dyslexic, blind disobedient mouse has been tamed.

Having failed to find an interface for the PC keyboard, I decided to pull that of the ST apart and 'have a look'. After detaching the keyboard from the body of the ST by undoing all the usual screws (in my case, removing the sellotape, I'm in and out so often) and sliding off the connector for the wires, laid it on its back with keys held clear of the desk by resting it on some disks placed in strategic positions. There are lots of small screws on the underside of the keyboard and removing them was very easy. While I was getting them out I noticed the little holes which accommodate the drive and power-on lights, so I took a deep breath and lifted the board from those two corners first. Having pulled the two sections apart I was presented with a lot of rubber cups, some stuck to the keys and others stuck to the keyboard, not to mention the two which fell on the floor and took me a very long time to find.

At this point I thought it worth the effort to separate those rubber cups into two piles. Those from the most used keys and those hardly ever used. When I came to put them back I swapped them over and took six years off the life of the keys! Even if your mouse is well behaved you might consider it worth the effort to do just this for a better response from the keys.

The port for the mouse is soldered into the PCB and this is where I found the cause of the trouble. Two of the solder joints were loose and had lifted the printed circuit to the point where it only made contact if the wind was in the right direction.

The solution was obvious. Buy a PC with a mouse connection at the back out of harm's way. But that's too easy and only costs money so I simply gave the mouse a triple by-pass operation by soldering wires from the faulty joints to where the printed circuit was supposed to connect about an inch or so away. It's very easy to see where the wires need to go and I used the stiff type of wire from a piece of multi cored telephone cable so that it would lay snugly flush with the board. When I'd put everything back together and switched on, there was no red light glowing in the bottom left corner of the keyboard and for one awful moment I thought that I was really going to have to spend a grand on a PC after all. Very carefully I backtracked and found that I had not let the tiny bulb fit into its hole when I put things back together. I straightened out the wires, offered up a prayer and put back those lots of small scre... Success! The mouse is a slave to my every command and the keyboard feels as good as it's ever been!

Of course, the usual disclaimer about being careful with soldering irons and the inside of computers applies, but this really was a doddle.

David J Fright

3D Calc

E Mills – STA 30
Alan Kennedy – Forum STA 32

A I used 3D CALC v2.16 and had the same problems. I raised them with Microdeal last May and heard nothing. But they had in fact passed my letter on to the author who replied direct with Version 3 free of charge. Great.

My concern was relative cell addressing in formulae and – as Alan says – the fact that formulae are not updated when inserting or deleting rows and columns. Version 3 is now as per the "Lotus123 Standard", according to the author. He also tells me that justification of labels (left, right or central) is not possible, and will not be, as "further development has been discontinued". For Version 3, contact the author:
Frank Schoonjans, Broekstraat 52, B-9030 Mariakerke, Belgium; Tel/fax (091) 274997.

Richard A Carsons

Datalite 2

Michael Baxter – STA 35

I Thank you for the excellent review of Datalite2, a program which I received five weeks after its scheduled release date. I have a Mega 4 with TOS 1.4 a Megafile 60 Hard drive with 5 partitions (C to G) formatted with Supra Software, and I find the Hisoft suite of programs Datalite2, Diamond Edge and Diamond Back2 excellent in every respect.

Perhaps I can throw a little light on one aspect Michael mentioned in his last paragraph headed Compatability & Reliability which advises not using Diamond Edge with a Datalited partition. Having had much contact with Richard Kiernan of Hisoft Technical Support concerning Diamond Edge, my observations and experimentation brought me to certain conclusions.

The answer is very simple: Diamond Edge shows the fragmentation of files on each partition as files are deleted, saved or enlarged and this fragmentation increases the access time and wear and tear on the drive. Diamond Edge, when optimising, defragments the files and rewrites them in contiguous order, improving drive performance and access rate.

Diamond Edge, like Datalite2, is superfast and reliable. However, if you optimise a Datalited, fragmented partition, the process is considerably slowed down because the information is compressed and the reason that Hisoft put that disclaimer in the manual is not because Diamond Edge will not optimise a Datalite Compressed partition – it will do so admirably – but because it is compressed information it can increase the optimisation time enormously. Richard confirmed my assumptions to be correct.

For instance, my 15 meg partition 'D' had 14 fragmented files and optimised in 2 minutes 8 seconds; my Datalited partition 'D' now 29 meg with only 2 fragmented files took 1 hour 48 minutes to optimise; my partition 'E' 15 meg, compressed to 29 meg, with 1 fragmented file, took 2 hours 20 minutes to optimise. The obvious danger here is the length of time because of power fluctuations or cuts or accidents in the working area, which could cause loss of data and not because of the program itself. Also, you cannot use the machine whilst waiting.

I also experienced a 3 fragmented compressed file optimisation on drive 'D' in three and a half minutes, so perhaps the type of file that fragmented and its position on the partition, determines the length of time to correct it.

It is reasonable to assume that when Michael Baxter, in one of his "cooler moments" of course, tried to optimise a Datalited partition, there were no fragmented files on that compressed partition, and the time increase to optimise in those circumstances would have been an unnoticeable couple of seconds.

It is safe to Defragment or Optimise a Datalite2 compressed by using Diamond Edge but it is a very lengthy process which requires a reliable machine and a guaranteed uninterrupted power source, giving you the freedom to go and wash the car down or emulsion the bedroom ceiling whilst waiting for it to complete. The results are magnificent though.

In all fairness, you should know that in the ST Club's superb range of programs is an American Shareware program that does exactly the same thing as Diamond Edge. It takes a little longer to optimise on uncompressed partitions but is much quicker with Datalite2 compressed partitions, is reliable and simplicity to use and is called STTools Version 1.92. It really does return a partition to its original compressed but unfragmented state. I use it myself if I have allowed the partition to get more than a couple of fragmented files before optimisation. It's excellent.

Brian Mc Nulty

SharpScore

David Harvey – STA 34

I I can fully understand that reviewers are under pressure when assessing software and that they do not always discover the presence of bugs in a program. Following the favourable review by David Harvey of Sharpscore in the October magazine, I feel that I should point out the various bugs which I have discovered in the program, some of which are quite serious. What is extraordinary is that many of these problems did not exist in earlier versions and the programmers have made no attempt to put them right, in spite of having had them pointed out to them on more than one occasion.

1. There are a number of problems concerning beaming, but the most tedious is the fact that straight beams appear between notes which are a step apart on the stave, when in fact they should be slanting (this was not always the case in much earlier versions).
2. It is not possible to contract the length of staves (for making musical examples for instance); this was possible in all earlier versions.
3. The percussion clef in non-standard and double bars with repeat signs have slanting lines, top and bottom which is not standard notation.
4. There is no facility for producing tremolo signs between black notes.
5. Landscape printing does not work properly in this latest version of the program.
6. There are a number of problems connected with the importation of midi data which make this facility tedious to use.
7. The automatic centring facility no longer works in the latest version of the program and transpositions come out incorrectly.

If this were some early version of the program, one might be forgiving of most of these errors, but when one is asked to pay £50 for an upgrade one does not expect to get a program which has more bugs than before.

Robert Sherlaw-Johnson.

I I am grateful for Dr Sherlaw-Johnson's comments, in particular as I am not familiar with earlier versions of the SharpScore product. While some of his problems seem (to me) to be issues of preference or usability, others are undoubtedly errors. I have put all these points to Take Control, who inform me that a new release is being finalised which addresses (at least!) points 2, 5, 6, and 7. This upgrade will be sent free of charge to users early next year.

It is easy to assume that a new version of a product will always be more reliable than an older one: anyone involved in the production of complex software will realise that this is not so. Changes between major version releases of products can be extensive, particularly when software or hardware platforms change (Speedo GDOS and Falcon support, for example: both of which are new features in SharpScore 3.0). I suspect too that Take Control have been preoccupied with the new version of the product announced in December's ST Applications, using the Falcon's DSP chip to perform acoustic recognition: while applauding the commitment to the new Atari machine, and being suitably impressed at the power of the new software, I hope that Take COntrol will continue to bear in mind existing users of the product, particularly when it comes to releasing fixes.

David Harvey

Wordflair

I When I couldn't find a word processor that would work with my recently purchased SpeedoGDOS it all seemed a waste of time. No Calligrapher, no Wordflair from Hisoft, and Atari Works some way off on the (real soon now) horizon. After an initial flurry of activity, Speedo was consigned to the 'really nice but not very useful pile'.

As you will be aware, this month's ST Format includes a full copy of Wordflair I on the

cover disk. The magazine write-up says you must upgrade to WF II to get Speedo compatibility, but I tried it just in case. The program works very well indeed with Speedo except for the usual problem of limited fonts. As a fully GEM compatible document processor it stacks up very well against the likes of Calligrapher & Write On. Its frame-based approach makes it as useful as Timeworks DTP. All this for just £3.99!

Suffice to say I have ordered the upgrade to WordFlair II so that I can get font scaling 'on the fly', a thesaurus and dictionary among other things (see Martin Norfolk's review in STA 26). Until Atari Works materialises, I shall really enjoy using this program!

Graham Curtis

Atari Inside!

There must be a word to describe those of us who are suckers for emulators.

From the early days, there have been adaptations to software and hardware to make things something that they're not. It isn't simply a case of the grass being greener on the other person's monitor.

In my case it has always been necessary for me to keep reasonably informed of what was available on the PC, so that I could keep up with the changing routines at my place of work. However, in my spare time I like to fiddle with 'pooters', do a little drawing and programming. And, of course, find ways around things that don't work the way they're supposed to. The Atari has fulfilled this need since the mid-eighties when I abandoned the old Dragon 32 and the MSX machines in favour of the ST.

I hadn't had it for long when PC Ditto came along and I splashed out a lot of money on an external five and a quarter inch drive, switchable from DOS to TOS. This emulator was software only and it ran quite a number of the things I needed. Problem was that it was slow. By today's standards, it was standing still. The speed test (Norton) used at the time, showed that compared to the original IBM PC I was working at 0.3. At the time, we had a turbo machine at the office which ran at 3.7. However, undaunted, I had it up and running and it helped me understand the mysteries of DOS. It eventually came to a standstill just as PC Ditto II came along.

This was hardware and destined to revolutionise the way we work. Trouble was that it didn't fit inside the ST case. Even If I hadn't already put in a row of chips on a PCB (Xtra Ram) which made the case bulge, there was no way that this would fit inside so it had to hang outside. I actually put i into a seven by five wooden chocolate box with a long slit made in the back of the ST for the ribbon cables to stretch from the ST's CPU, to this external board full of chips.

I've forgotten the exact figure, but the Norton test was showing something around 4.0, so compared to the original PC Ditto (and the original PC) it was fantastic. Mind you, at about this time, the machine at the office was showing twice that. Nevertheless this was a good bit of kit and when it worked OK it worked OK. It ran just about everything that I tried on it. I even got the DOS version of GEM (if that's not a contradiction) running First Word which really made me feel at home and wonder why I'd bothered in the first place.

With the aid of PC DITTO II I managed to learn quite a bit about the PC, even though there has been no replacement for the ST as far as ease of use and sheer enjoyment is concerned. Not to mention the correspondence I have with various nutters around the country.

Eventually though, I bought a PC with Windows, but before splashing out the few quid the tax man lets me keep from my earnings, I got details of the Gemulator from the ST Club, in case that should influence my choice of PC.

The details came in the form of a little booklet which set out quite clearly what could be expected from the Gemulator. I felt that this information was put together in an honest way, even giving expected speed ratings from given set-ups. On my 486 DX/33 the results are more or less as the booklet says.

I ordered one. They weren't available!.. I waited..and waited, and phoned Paul Glover - more than once! Was this vapourware I wondered. I was anxious to clear my extensive Atari set-up from my desk because I now had this PC with its monitor sharing space with the two Atari monitors. I was getting cold feet and had almost got to the point of selling off the Atari regardless, when it arrived. Only two or three months late, but then, what's that in the Computer world?

Was it worth waiting for? In a word, "yes".

What we get for our money is something that we can install in an hour and forget. PC machines have expansion slots into which expansion cards simply slot. The Gemulator hardware is such an expansion card on to which we have put the TOS 2.06 ROM chips (supplied) before slotting it in. Incidentally, should you have the need for more than one TOS version, the manual says you can have up to four.

The software puts the ROM into memory at boot-up and prompts you for the size the ST is to be. This of course depends on the memory available; a 4 Meg machine gives you a 1040 ST.

A program is included which creates a partition on the hard drive, suitable for the ST only. This is the safest and easiest way to use the hard drive without backing up all your PC data and starting from scratch. The downside to this is that to move a file from DOS to TOS it has to go by floppy disk - who would want to do such a thing?

There is an initiation file which will allow you to set your boot-up defaults (fancy it all in Dutch?). Once up and running, the change from colour to mono is done with a key press! I don't have TT programmes, but the manual says that if I did have, the screen resolution would respond to them in 1280x960 if necessary.

The manual is a twelve page A5 booklet which covers various situations and generally gives clear instructions. With it comes a 40-page manual for TOS 2.06 which explains all the new gear that I never had in TOS 1.0 (the delightful control panel for instance).

There is a separate leaflet which explains how to install the Gemulator and another which explains how the TOS 2.06 EPROMS should be installed in an ST without using the emulator. Not to mention the Registration cards of course, one for Compo and the other for Atari ST Nieuws in The Netherlands. I searched in vain for a little sticker 'Atari inside!' to put on the PC next to the Intel one. I have now been using it for some weeks and once I determined which progs work and which don't, I settled for a few of my favourites and will take pot luck with the future.

Firmly installed and in use are, in no particular order: GFA Basic 3.5, First Word+, CAD 3D (Antic), Degas Elite, Write ON, JC View, and JC Label. Programmes of mine such as Polystar written in GFA work fine but some of my STOS prgs such as Pulser get hung up about the mouse routines.

STOS prgs which do not call the mouse seem to work OK but of course the language itself when used to write prgs uses the mouse so it's not usable with the Gemulator. Shame really, but unfortunately STOS has not been supported too well during the TOS changes so it has its share of problems anyway.

Fast Basic is a language I haven't used for some time but I dug out some of my early prgs and found that they work very well indeed. I haven't done any in-depth programming in Fast Basic on the Gemulator, but it seems OK.

My biggest disappointment was with Timeworks Publisher; it loads and runs and does all that it's supposed to do but at about five times slower than its usual 0 to 60 eventually. I had a meal while waiting for the FONTWID.PRG to run when I installed the printer. This may be a memory limitation, I don't know. It didn't take long to DE-install!

I don't drink Carling Black Label so I can't comment on Calamus etc.

If anybody ever actually used NEO then they too will be disappointed: it loads but flashes and jumps around.

SuperBoot (invaluable for switching GDOS off and on, among other things) works fine but the other member of my AUTO team - Headstrt - is sorely missed because that useful auto programme runner gave up the ghost. Is there an update out there for the later TOS?

The successes far outweigh the failures and once you've got used to a few idiosyncrasies it is a worthwhile system. Of course, the grey-faced bean counters would say that it's not a viable proposition, but then I'm less pragmatic when it comes to things Atari. Yet, upon reflection, look at the price of some of the progs available for both the PC and ST and make a few comparisons. Those bean counters might have to think twice.

One of the 'idiosyncracies' when using the virtual hard disk system is that whenever the 'desktop' is saved it will try to save it on drive C which on my system the Gemulator can't read. However, this is not a major problem because when you boot up and find only drives A and B shown, a click on 'Install Device' under Options on the menu bar will bring up your C and D icons instantly. Click on

the D drive icon and your virtual disk contents are displayed in the usual way and you are once more at home with the ST.

Of course my scanner won't work because different hardware interfaces are used. I shall replace that but in the meantime the software which came with the scanner is still serving its secondary function as a file converter to change various graphic file formats. I didn't tell it that it's no longer in an ST, and it doesn't seem to mind.

Universal Item Selector III is still in use, even though the item selector which comes with TOS 2.06 has one which is an improvement on my old (TOS 1.0) version. Sometimes, when reading or writing to the floppy, the drive appears not to respond (to use the words of the dialogue box) but it usually wakes up when you press Enter to Retry. Sometimes the filenames under icons change to what looks like Hebrew, but a forced re-read by hitting ESC acts as an instant translator.

Epilogue

About a week after I installed the Gemulator, and had decided that as an emulator it certainly put PC DITTO II in the shade and was well worth having, I picked up a comic in Smiffy's and noticed a review of the Gemulator which must have been written by someone who can't read. (Or perhaps he likes to drive the wrong way on motorways.) He slagged it off as having killed a PC when he tried to write to the hard disk. The Gemulator manual clearly explains how NOT to damage a hard drive. It gives alternative ways of using the hard drive to accommodate the restriction that Atari has regarding the 32 meg. barrier. This takes no understanding at all; just follow the instructions and it is all self-installing.

I have now sold my complete Atari kit to the first person who came round to look at it. A big selling point was my obvious enthusiasm for it, supported by the fact that I was not abandoning it with the sale.

In the clear-up which followed, I found an article about an emulator to enable the PC to act as a TV... now there's a thought.

David J Fright

● All permuatations of Calamus run fine with the Gemulator - a lot cheaper and quicker than waiting for Calamus for Windows NT! Timeworks may well spring into life with a future upgrade to the Gemulator software, or you could just buy a (very cheap) copy of the PC version of Timeworks Publisher!

GOGO ST and PD Updates

Q Disk INI.52 says it contains V3.2. In fact it is V2.3 (typo). Does anyone have a version between V2.3 and v5? I tried registering the Shareware but no reply, and am sick of the Log Facility. I can turn it off, but since you cannot save the configuration, it is on again next time. On earlier versions (after v2.3) you can switch it off and it stays off! Anyone? And please amend catalogue listing.

On the subject of the PD Listings, please can you stop printing them in the magazine? Over the months, to find anything, I have to refer to the main catalogue and then search for all the updates. Can you not print updates loose so we can keep them all together with the main catalogue?

Richard A Carsons

● PD Updates usually start on a right hand page so that you can cut them out and file them separately. It would be nice to be able to supply PD Updates on loose pages but the cost of printing and inserting is prohibitive.

Hard Drives and STOS

Q Some of my queries have been answered by Mark Baines's articles but... I have a Protar 80DC Series One hard disk - and am delighted with it, except for the fan noise. However STOS will not run properly when the HD is on. I can run STOS from disk and save and load okay but the same files will not load when STOS is run from the hard drive.

I spoke to the Helpline of the magazine that recently gave STOS away on their cover disk and they told me that the Protar driver uses some naughty addresses which clash with STOS. He suggested I speak to Atari and/or Protar to get an updated driver.

Atari were not interested as these are third party products. Protar seem to have gone out of business.

Someone mentioned ICD. Advise me please. Having been unemployed for some time, I cannot afford the £40-odd that the adverts suggest for this ICD product - yet Mark Baines talks about some PD drivers. Recommendations? Any suggestions?

Richard A Carsons

● Atari and ICD driver software is available on PD disks from our catalogue. Protar are back in the UK in the hands of Analogic.

DeskJet 510

Q Help! I am having difficulties with my new Hewlett Packard Deskjet 510. I'm using a 1 meg STE, with Timeworks Publisher 2 - but no matter what I adjust it will not print below 3 cm from the bottom edge of the page! I have set Timeworks DTP to A4, set the printer to A4 (as well as trying every other DIP switch combination!) but to no avail. But, as soon as I load up 1st Word+, everything is fine, print will continue to a reasonable 1.5cm or so from the bottom! Not a hardware problem then!

Frankly, I'm baffled. Has anyone else encountered this problem? (I have a friend who had absolutely NO problem printing from his HP Deskjet 500 with Timeworks 2 - it printed to about 1.5cm as you'd expect!) I'd appreciate any help!

Martin Waterhouse

● We too have no problems with Timeworks and the DeskJet 500. Which form of GDOS do you use? And which printer driver? (We use the Turbojet drivers for Timeworks, both for the DeskJet and for the HP Laserjet IV.) You could try changing the vertical and horizontal offsets in 'Set Column Guides' in the Options menu. We need to use +0.15" for both on the DeskJet and +0.45" (vert.) and +0.2" (horiz.) for the Laserjet. Plus values raise and move the 'page' to the left; minus values lower and move it to the right. (DFS)

Questions and Answers

I With the advent of new art packages along with ImageCopy 2 and SpeedoGDOS, things are certainly looking brighter for computer art enthusiasts such as myself. Having used Flexidump and, more recently, Flexidump Plus 2 to print unconverted PC files in colour and mono, I finally settled on PageStream 2.1 to do the necessary. Indeed, the latter is excellent where 'non-separated' colour output is concerned. Not only that, it enables one to scale pictures with ease. Mind you, with 4mb RAM and a hard disk, I suffer no lack of speed. Nevertheless, I wonder why reviewers, including the admirable Andrew Wright, haven't emphasised this facility more fully when describing PageStream's many virtues? I'm sure the tyros amongst us would have been interested.

Despite the fact that you, Sir, answer many of the questions raised in Forum, a number appear to remain unresolved in subsequent correspondence. Presumably - and quite understandably - you had hoped that your readers would take up the cudgels and answer such questions themselves. Unfortunately, as letter writing is anathema to many, it's inevitable that some questions will never be answered. In view of this, perhaps you would now consider introducing a "Questions and Answers" slot to be published monthly under specific headings; such questions to be answered in depth - in simple terms - by one, or more, of a panel of experts under the appropriate subject heading. Is an innovation of this nature feasible?

Perhaps some of your less technically minded readers might find such observations of interest... I hope so.

I'm now well acquainted with both Imagecopy2 and True Paint and must say that their image file conversion facilities are excellent. Both enable Degas PC picture file formats to be easily converted into IMG and TIFF formats - amongst others - before being exported as such. Additionally, True Paint allows PC picture file formats to be converted into JPEG (JPG) format before export. Having taken advantage of these facilities, I was amazed to view a number of my converted PC picture files on an SVGA monitor; each file having previously been imported into Coral Draw via a 486DX (PC) computer. Definition was terrific, not to mention the bonus of being able to enhance each picture using Coral Draw's extensive range of colours and tools. Even more impressive was the quality of output on a brand new Canon BJC600 (colour) printer producing 360-dpi. Never again will I

be satisfied with my 180-dpi Star LC24-200 colour printer!

Keith Markland

● We try and accommodate in-depth answers to queries in the Programmers' and Beginners' Forum pages. The danger with attempting to answer all of the questions raised in the Forum is that quick off the cuff answers tend to stifle in depth replies from readers who have more to say. And with the Forum being prepared precariously close to the magazine printing date there is a danger of getting the answers wrong, and little time to consult experts. ST Format and ST Review publish good Q&A columns - the Forum is meant to be something diffrent.

Modula 2

Q I have a question. Do you know of any company that could supply me with the Modula 2 programming language? I wrote to one company several weeks ago but they never answered the letter.

● There is a shareware Modula 2 disk in our catalogue - no details of any commercial offerings still available.

Modems, Viruses and OLRs

Q I am always careful about viruses when I obtain new disks and use UVK v5.9. But I am considering buying a modem and going on-line to BBSs, for contacts and to up/download files. What virus protection do I have when connected to some external computer? Is my hard disk at risk?

Secondly, I see plenty of PD Comms Programmes (Freeze Dried, etc.) and the commercial Stalker but what about Off-Line Readers? All articles suggest using an OLR to keep on-line costs down but I've not seen one recommended. I know you can read and prepare messages in a WP but what do I need to grab them quickly and store them when on-line? Are OLRs part of the comms programmes themselves or something separate? Are they all compatible with each other? Advice and recommendations please. Many thanks.

Richard A Carsons

● There are a number of OLR programs in the PD Catalogue - and many more available for download on BBS's. You should also check out Mark's Going On-Line comms columns in back issues of ST Applications - he has covered most aspects of comms in them.

There is virtually no chance of a BBS systems computer directly causing damage to your hardware and software. But there is every chance that you can download programs that can cause problems. The worst possible case I can imagine is an apparently useful program that when run simply deletes all of the files from your hard disk - the possibilities are endless! Treat all downloaded files with suspicion until you have checked them out; and turn off - or write protect - your hard drive when running new programs.

Don't get too paranoid - with an ST you are a lot safer from viruses than PC and Mac users whose systems have system files that can be invaded and infected. The vast majority of ST viruses are simple boot sector programs that are easily detected and removed.

Photographs

Q Thanks for the nice photos of the HiSoft team. Why not have photos on the cover too?

Printing good photos is a headache for me on my ordinary ST with ordinary software. I hope you will write some information about how you do it!

Paul Dion

● We cheat by simply sending the photographs to the printers along with scaling and paste up instructions. We could get good results (eventually) with a 256-grey scale scanner, PageStream or Calamus SL, and a LaserJet 4 printer, but why bother when printers will do the job on the best hardware money can buy for a few pounds per photograph?

If ST Applications was a news-stand magazine we would probably have to put photographs on the front cover. But photographs of what?

Streaky Printing

Q Why do I get horizontal gaps in the print out of colour pictures? This is driving me mad, especially as my son has spent hours drawing this picture for a school project, and I cannot print the picture to a good standard. Is this related to 'line spacing', if so how can I change the spacing?

My hardware is a 1040 STE with TOS 1.62, mono SM 124 monitor, 105MB hard-drive, Citizen 24-pin colour printer. The software is the Duluxe Paint V1.00B printing utility using its printer driver Epson Marco, but the same problem occurs in NEC Marco.

I also wrote to Citizen Europe help line with the same information only to be told there is nothing wrong with my printer, but no answer on how to correct it. Please can you help me?

Paul H Finch

● Sounds odd. Do you get the same sort of results when printing in graphics mode from other programs? Try the demo version of Imagecopy Colour or something similar. Double check the printer set-ups if the results are still wrong and contact Citizen again if the problem does not go away.

Programming Problems

Q The series produced by Andy Pennel was particularly interesting to me. One aspect I am currently struggling with whilst attempting to write a database program for cataloguing my 35mm Slide collection is the scrolling of windows using Power Basic. Would it be possible to either include this part of my letter in the Forum section asking for help, or perhaps persuade Andy to do an article covering this?

Thank you for your magazine and its support and encouragement to the faithful!

Peter Benson

Reducing Colours

Q A couple of months ago I bought a Video Master (by Microdeal). At about the same time I purchased a camcorder. On October 20th 1993 I visited nearby Soesterberg AB to film F-F15s of the 32nd Fighter Squadron, USAF Europe. These aircraft are about to abandon this base, and this was their going away party.

Yesterday I put the Video Master into my cartridge slot and started to digitize my footage shot at Soesterberg. Recently I learned that if you want to digitize "real" colours you then need an extra device, next to your Video Master, named an Electronic Color Splitter, which would cost about 400DM! Since I don't plan on spending that much money yet I am satisfied with the grey-scale-picture...

The reason I am writing you is that I wanted to add bright colours to these grey scale pictures. That's when I found out that the VideoMaster uses up all 16 colour slots when in low resolution which makes it impossible to make one colour slot, say bright red.

Has anyone got a program that reduces these VideoMaster pictures to, say, 8 different grey-scales, which frees up 8 slots for other colours? I would also be interested in a program that converts a greyscale picture into a high resoslution b/w picture and saves the result into a PC3 file!

Aljo Wijnands

● Many picture file conversion programs will reduce the number of colours in a picture from 16 to 4 (medium res) or 2 (high res), but obviously no-one has ever perceived a need for anything in between. High end graphics applications such as Retouche can undoubtedly do this type of operation, but this is an expensive application for such a trivial problem.

One possibility would be to go in the other direction and use a paint package such as Spectrum 512 to increase the number of available colours. Failing this you will need to analyse the palette used in each picture and find one that can be sacrificed by touching up the areas used by that colour with an adjacent colour. Fine if you want just one or two additional colours - but very tiresome for reducing the number of colours right down to eight.

Wish List

I One for the wish list. I can't understand why there isn't a utility to convert between popular text formats. It's easy to convert graphics, even sound files, so why not text? There are so many formats (ASCII, RTF, 1st Word, That's Write etc etc - not to mention PC or MAC files), and it's frustrating to have to convert everything to ASCII to get it over.

Martin Burrough

Readers' Survey Results

David Smith takes a brief look at what the returns from the Readers' Survey in issue 34 reveal...

The overall picture drawn by an analysis of the returns shows that our readership is in the main satisfied with the magazine as it is. There was no weighty evidence that readers wanted to push the magazine into either a different format (colour, layout style) or a different direction regarding contents or balance. 94% thought that the present general level of the magazine was just right, with only 5% thinking it too 'heavy' and 1% thinking it too 'light'. 27% were in favour of a move towards colour (and a 50% increase in price), whilst 73% were happy with the current monochrome presentation, a good number of them adding that the "content" mattered more than a glossy colour finish. 74% were happy with the subscription rate then in force, 24% thought it was 'cheap' and only 2% thought it too expensive. How well these figures would still hold today is, of course, another matter!

More or Less?

Those questions that pinpointed specific areas of interest showed that the general subject areas such as operating systems, letters, reviews and utilities were more popular than the 'niche' topics such as Art, CAD, MIDI and Comms. In the "More/Same/Less" section there was a majority in favour of more h/w and s/w reviews (60% and 55%), tutorials (51%), PD Reviews (63%), s/w comparisons (72%) and Utilities (56%). In those areas that currently do not get as much treatment as they could (should?) - s/w comparisons, for example - this is hardly surprising; but the heavy 'More' votes combined with a substantial 'Same' vote for areas such as reviews, tutorials and utilities, that are already the mainstay of the magazine, surely show that we are more or less on the right track.

The areas that got low 'More' votes and high 'Less' votes (more correctly 'Fewer' in most instances) were again the niche subjects - MIDI, Comms, Art and CAD. No prizes, incidentally, to those of you who spotted our deliberate mistake; namely, the impossibility of having less than nothing in the Games arena! Our Forum pages already constitute a large proportion of the magazine's pages, but 35% of you wanted more and none of you wanted less! Some of the 'Further Comments' at the end of the survey showed that areas such as WP and DTP might be slightly overdone, but in this section at least only 9% of you wanted less of either. Programming fared quite well with 35% for more and 22% for less.

Marks for the Regulars

The first part of the survey (the one that asked you to give marks between 1 and 5 for our regular features) backed up the results of section two, outlined above. The maximum mark obtainable from the returns was 565, and the top three features were Forum with 503, the News pages with 453 and PD Update with 449. Next came Desktop Discussions with 422 and Beginners' Forum with 394. Again, the more specialist areas did not fare so well. Going On-Line came bottom with 270, showing perhaps that if this is the sort of thing you are into you are far more likely to read about it and exchange views and information on the comms lines themselves rather than in the pages of a magazine...

Question 1

Marks awarded from a possible total of 565:

Beginners' Forum	394
CAD Column	305
Desktop Discussion	422
Falcon Applications	313
Forum	503
Going On-Line	270
Grafix Arts	283
News	453
PD Update	449

Furthermore...

52% of you wanted the Disk Mag to stay as is, with only 19% opting for a monthly issue and 29% saying they'd prefer none at all. Only 6.4% of you said you intended to buy a Falcon unconditionally, whilst 62.4% said they definitely wouldn't. 31.2% ticked the 'only if' option and the top four conditions were:

1) reduction in price
2) Atari get themselves together
3) new casing
4) more compatibility with existing ST s/w

The 'Further Comments' section showed some degree of concord in one or two areas:

- ✓ too much knowledge/expertise taken for granted, especially in programming and the use of jargon and acronyms;
- ✓ Falcon Applications should *not* take over too great a portion of the magazine;
- ✓ more reviews of PD s/w;
- ✓ more articles on how to use s/w, such as the Protext ticket printing;
- ✓ more (editorial) comment;
- ✓ competitions;
- ✓ binders (incidentally, W.H. Smith does a magazine binder with steel rods for £4.99);
- ✓ yearly index of articles;
- ✓ promote STA for wider readership.

"I meet a lot of ST owners who aren't aware of the existence of this mag. If we could only find a way of getting their attention (I sometimes feel like an ST Applications Evangelist!), particularly for more 'serious' applications."

"If the Falcon takes off, the ST content of STA will, presumably dwindle. Please make it clear to readers when you switch. Perhaps a separation would be fairest with STA continuing as a bi-monthly but with a section on Falcon affairs."

THE WINNERS of the 6-issue subscription prize draw are:

GJ Williams from Bicester, *Sam Marshall* from Nottingham, *AC Baxter* from Leicester, *PJ Tjaden* from Southampton, *KJ Wood* from Crawley and *P Catmull* from London.

Question 2

We give only the More and Less results, as these are the more telling:

	More %	Less %
H/ware reviews	60	1
S/ware reviews	55	0
Tutorials	51	3
Art	12	22
CAD	16	27
Comment	30	4
Comms	5	42
Dbase/Sheets	31	12
DTP	45	9
Games	9	48
MIDI	16	45
Operating Systems	34	9
PD Reviews	63	0
Programming	35	22
Letters	35	0
S/w comparisons	72	0
Utilities	56	0

Programmers' Forum

In this month's edition of ST Applications' regular programming column, we look at a variety of issues raised by one reader.

The Letter

Every now and again, *Programmers' Forum* receives a letter from a reader that occupies a whole month's column. This may be because the programming issue is particularly juicy (for example the joystick-mouse code published in STA22 and STA23). Alternatively, the material may be of sufficient general interest that it warrants such attention. Such is the case for this month's column, which is devoted to a letter from **Matthew Hardy** of London SW18.

Matthew begins with a word or two of introduction:

I own a 2Mb 520STE and am currently developing some MIDI software for home use with a Yamaha TG33 tone generator. It is written in C and the user interface comprises a few dialogue boxes with which to interact.

The subject of MIDI is one that interests many ST owners and is, in part, responsible for such success as the machine has enjoyed. GEM programming can be one of the trickier aspects of writing software for the ST. Put the two together, and there should be something of interest for most ST programmers.

GEM problems

Matthew's letter continues:

Having completed most of the work as a GEM program (.PRG), I then set about the task of converting it into a desk accessory since it will be much more useful as such. Having done so, a rather noticeable reduction in performance appeared in one particular area of code. I need to monitor and act upon both left and right mouse buttons - thus preventing me from using the standard form_do() routine - so I wrote a very simple routine using graf_mkstate(). I put this in a loop which executes some code when an object on a dialogue box is pressed (with either mouse button) and exits when the user then releases the button.

Running as a program, this worked fine and even the quickest press of a mouse button produced the desired result. However, as a desk accessory, I have to hold the mouse button down for a noticeably longer period of time before anything happens. The code is something like this:

```
finished = FALSE;
pressed = TRUE;
do
    {
    graf_mkstate(&x,&y,&b,&d);
    if ((b != 0) && (!pressed))
        pressed = TRUE;
    if ((b == 0) && (pressed))
        {
        pressed = FALSE;
        finished = TRUE;
        }
    }
while (!finished);
```

Does the problem lie in the graf_mkstate() call?

The difference Matthew observed between GEM programs and desk accessories in their responsiveness to mouse clicks seems to be real. As he surmised, the problem does appear to lie in the graf_mkstate() call. Quite why this should be, I'm not sure, but it might be related to another odd interaction between mouse clicks and desk accessories.

There is a known bug in TOS mouse-click handling that first appeared in TOS 1.04. A single click on window scroll bars often results in two clicks being processed. It may not be entirely coincidental that a cure for this rather annoying effect is a desk accessory (BUTTNFIX.ACC by Charles Johnson). The accessory works by simply waiting for the spurious double-clicks and ignoring them. Why this should affect the number of clicks received by the foreground process is not clear.

Listing 1 contains source code for a short accessory to use as a test-bed for exploring this area of programming. As it stands, Listing 1 suffers from two problems - the sluggish response to clicking, and the fact that the Desktop or main application's menu bar will still be active while the dialogue box is displayed.

Replacing the do_dialogue() function with the modified version in Listing 2 solves both problems. The inclusion of wind_update() calls bracketing the dialogue handling loop serves to lock out other uses of the mouse during the dialogue interaction. The replacement of graf_mouse() with vq_mouse() gives a much better response.

However, by doing custom dialogue handling in this way, all the benefits of using form_do(), such as radio-buttons, TOUCHEXITs and so on, will be lost. Interested readers who would like to solve the problem neatly might like to look at a back issue of ST Applications (number 3) where there are some listings showing how to make a form_do()-like routine. With a little experimentation, it should be fairly easy to make something work as required.

MIDI processing

Matthew's second question moves on from the quirks of the GEM interface to the practicalities of processing MIDI data:

My other problem is encountered when trying to receive MIDI bulk dump data from the TG33. It transmits approximately 30Kb of data from which I need to extract 512 bytes. Since I don't need to store all 30Kb, I don't want to have to declare a buffer this size and capture all the data (although I wasn't fully successful when I tried this), so I tried extracting the relevant data as it came in. No joy. The code looks something like:

```
while (!Bconstat(3))
    {
    }  /* wait for MIDI data */
while (Bconstat(3))
    {
    x++;
    d = Bconin(3); /* Get MIDI data*/
            /*while it's coming in */
    /* Code to store MIDI bytes when */
    /* x reaches certain values */
    }
```

One problem may be that the TG33 transmits the data in 16 batches, each of which is separated by a 100ms delay. However, in trying to diagnose my code, it doesn't seem to fail at one of these 100ms boundaries. Can you throw any light on my problem? Am I going about it in the right way?

I would guess that the problems may be caused by a lack of speed. The BIOS Bconstat() and Bconin() routines are notoriously slow, hence the profusion of 'fast-print' patches for printers with large buffers like the DeskJet. By the time the system has signalled that a character is present, the C program recovered it and decided what to do with it, several more characters may have arrived.

There are several ways to approach the problem. The first and simplest, the 'sledge-hammer' technique, is to use malloc() to temporarily allocate a buffer for the whole 30Kb dump. This would be filled by a tight loop which simply gets characters from the port and stuffs them into the buffer as fast as

possible without attempting to interpret them. After the acquisition is complete, the required block can be extracted before the space occupied by the buffer is recycled by calling free().

This approach would probably be feasible in this case, where the data stream is restricted in volume. Attempting to apply such a technique to larger blocks of data is likely to result in problems. A more interesting and general method is to write a flexible MIDI input-handling module that bypasses the slow BIOS routines. Some code that meets this specification is presented in Listing 3.

Design and Implementation

The strategy adopted in this code is to provide a programming interface to a low level routine which is designed to read MIDI input soon after its reception by the hardware. This routine sits at the level beneath the slow BIOS code, and so has time to process the data. The programming interface hides the low-level details from the rest of the application.

The package allows an application to specify chunks of data which should be captured from a stream of arbitrary length. Any number of chunks can be grabbed by the routine. Each chunk is described by an element in an array of MIDI_BLOCK structures. The structure specifies the start and finish offsets of a chunk within the data stream (mb_start and mb_end), and the address of a buffer into which the chunk data should be placed (mb_buffer). The other member of the structure, mb_valid, is a flag which is initialised to FALSE when the data acquisition begins, and is set TRUE when the chunk has been acquired.

To use the system, an application should call start_capture(), supplying a list of chunks to be captured. The chunks should be arranged in chronological order within the data stream, and should not overlap. The list must be terminated by a structure with a NULL mb_buffer member, and should not be altered while start_capture() is active. The first byte to arrive after start_capture() is called is deemed to be byte 0 for the purpose of locating chunks.

start_capture() installs the new MIDI input handler which accumulates the data until the last chunk is captured, when it becomes inactive. The is_capture_finished() function will return FALSE while the handler is active, and TRUE when the last chunk has been processed. Capture of individual chunks can be monitored using the mb_valid flags. The total number of bytes captured is made available to the application through the bytes_captured() function. After all the required data has been obtained, the package should be unhooked from the system using the end_capture() function.

The core routine in Listing 3 is MIDI_capture(), which appears towards the end of the listing. This function is hooked into the system 'MIDI data received' interrupt, which is part of the keyboard vector block (see Box). In a traditional program this function would have been written in assembly language. As written, the program makes use of the excellent control over code generation offered by the Lattice C 5.5 system. The function is called in supervisor mode every time a character is received from the MIDI port. The newly-received character is held the lower eight bits of in d0. After processing, the function returns using the rts opcode. The operating system preserves the values of the registers that it needs across the handler invocation. Porting of the listing to other C compilers may require that this function is recoded in assembly language.

Listing 4 shows how the package might be incorporated into an application. The capture list consists of two blocks, of 16 and 256 bytes, which start at offsets 16 and 512 within the data stream. To cope with possible errors in the input link, a timeout of 60s is used. If the acquisition is not complete within this time, an error is signalled, and the package unhooked.

The system seems to work well in practice. In a very useful follow-up letter, Matthew suggested that data chunks which consist of ASCII text could be captured directly into the strings used to process them elsewhere in the program:

One of my main aims with the part of my program which handles MIDI capture is to extract the names of 64 voices which my TG33 transmits (it also transmits loads of extra information (586 bytes of it) with each voice - but I don't need this). I was planning on storing the names in a character array (similar to other static voice arrays which I have already set up).

This is easily done, as the following fragment shows:

```
#define VOICES 64
#define NAME_LENGTH 8
char voice_name[VOICES][NAME_LENGTH+1];
MIDI_BLOCK block_list[VOICES+1];
for (f=0; f<VOICES; f++)
    {
    block_list[f].mb_start = (586 * f) + 29;
    block_list[f].mb_end = (586 * f) + 37;
    block_list[f].mb_buffer =
                    &voice_name[f][0];
    }
block_list[VOICES].mb_buffer = NULL;
```

The list of MIDI_BLOCKs set up by this code can then be used to direct data acquisition using the package. Of course, if the voice names are to be processed as C strings, it would be necessary to ensure that they were properly null-terminated after acquisition is complete.

Keyboard Vectors

The interrupt structure of the ST has been discussed at length in other issues of Programmers' Forum, so a full description will not be attempted here. Suffice it to say that interrupts from both the keyboard and MIDI hardware are serviced by a single channel of the MFP 68901. Interrupts may be due to the arrival of MIDI, joystick, mouse, clock or keypress data or even serial transmission errors. The funnelling of so many interrupt sources through one pathway is responsible for some of the unfavourable interactions that can occur when large numbers of MIDI and mouse events occur in a short period of time.

A central low-level routine catches the signal and decides what has caused the interrupt. Control is then passed to an appropriate specialist routine for higher-level processing using a jump-table located in RAM. The address of this table is obtainable using the XBIOS call Kbdvbase(), which has the function code 34. Kbdvbase() returns a pointer to a list of addresses of handler functions. This list format is shown in Figure 1.

By writing an appropriate handler function and inserting its address into the jump-table, it is possible to take over processing of particular interrupts. This is the purpose of the MIDI_capture routine in Listing 3. Other vectors from this block (particularly the mouse vector) have been featured in past issues of Programmers' Forum.

Next Month

Next month, *Programmers' Forum* will feature some more newly-rediscovered questions and tips from readers' letters. Keep the letters coming in - the more we receive, the better the column gets! Hints on any subjects, or questions about programming problems should be sent to the address below. All contributions, no matter how simple or advanced, are most welcome. Please include your address on the letter, so I can get back to you if anything in your contribution is unclear. Email addresses are useful too.

One last point, about email. Whilst I am very happy to receive contributions by email, please include your real name in the message, as cryptic alphanumeric user identifiers are not terribly useful. Please send a disk (or email) if there are large chunks of text or ASCII source code: I have no time to retype lots of material. Naturally, disks will be returned if an SAE is included.

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Figure 1

Offset	*Handler Name*	*Function*	*Input Data*	*Return*
$00	midivec	MIDI byte received	Character in d0.b	rts
$04	vkbderr	Keyboard serial link error	None	rte
$08	vmiderr	MIDI serial link error	None	rte
$0C	statvec	Keyboard status packet handler	Ptr to packet in a0	rts
$10	mousevec	Mouse movement/button packet handler	Ptr to packet in a0	rts
$14	clockvec	Real-time clock packet handler	Ptr to packet in a0	rts
$18	joyvec	Joystick packet handler	Ptr to packet in a0	rts
$1C	midisys	Lower-level MIDI handler	Untouched hardware	rts
$20	ikbdsys	Lower-level keyboard handler	Untouched hardware	rts

```
/*
** Listing 1.
** Programmers' Forum STA 37 (January 1994)
**
** Demonstration accessory shell for showing
** techniques for dialogue handling by accessories.
**
** Compiler system: Lattice C v5.51
** Compile options: Phase 1: -cargfku Phase 2: -ms
** Link with CACC.O, LCG.LIB and LC.LIB
** Written on 14th June 1992
*/

#include <aes.h>
#include <portab.h>
#include <vdi.h>

/*
** Resource data produced by DERCS
*/

#define BUTTON1 2
#define BUTTON2 3
#define CANCEL  4

TEDINFO rs_tedinfo[] = {
/*0*/   {"Test dialogue box", "", "", IBM,6,TE_CNTR,0x1111,0,2,18,1),
};

OBJECT box_rsc[] = {
/*0*/   {-1,1,4,G_BOX,0x0,0x10,(void *)0x21100,1,1,31,8},
/*1*/   {2,-1,-1,G_BOXTEXT,0x0,0x10,&rs_tedinfo[0],6,1,21,2},
/*2*/   {3,-1,-1,G_BUTTON,0x11,0x1,"Button 1", 4,4,9,1},
/*3*/   {4,-1,-1,G_BUTTON,0x11,0x0,"Button 2", 19,4,9,1},
/*4*/   {0,-1,-1,G_BUTTON,0x27,0x0,"Cancel", 12,6,8,1},
};


/*
** Global variables...
*/

short ap_id;                            /* AES application ID           */
short menu_id;                          /* Our menu entry ID            */
short AES_handle;                       /* The VDI handle used by AES   */
short VDI_handle;                       /* Our VDI handle               */
OBJECT *box;                            /* Pointer to dialogue box tree */
short sx, sy, sw, sh;                   /* Position and size of box     */
short work_out[57];                     /* Arrays for v_opnvwk          */
short work_in[11] = {1,1,1,1,1,1,1,1,1,1,2};

/*
** Internal function prototypes...
*/

int main(void);
void do_dialogue(void);
void initialise(void);


/*
** Begin here with normal desk accessory
** initialisation and installation.
*/

int main(void)

{
    short pipe[8];

    initialise();
    while(TRUE)
        {
        evnt_mesag(pipe);
        if (pipe[0] == AC_OPEN && pipe[4] == menu_id)
            {
            VDI_handle = AES_handle;
            v_opnvwk(work_in,&VDI_handle,work_out);
            do_dialogue();
            v_clsvwk(VDI_handle);
            }
        }
    return(0);
}


/*
** Function to initialise the parts of the
** program concerned with the GEM interface,
** and also to oversee the splicing in of the
** system hooks.
**
** Usage:   void initialise(void);
*/

void initialise(void)

{
    short dummy, f;

    ap_id = appl_init();
    menu_id = menu_register(ap_id,"  Test Accessory");
    for(f=0; f<5; f++)
        rsrc_obfix(box_rsc,f);
    box = box_rsc;
    form_center(box,&sx,&sy,&sw,&sh);
    AES_handle = graf_handle(&dummy,&dummy,&dummy,&dummy);
}


/*
** Function to handle the display of the program's
** dialogue box.  The data for the resource file is
** in the assembler module, and it should be fixed
** up before use.  There are no arguments and no
** returns.
**
** Usage:   void do_dialogue(void);
*/

void do_dialogue(void)

{
    int finished, pressed;
    short mx, my, b, d, obj, click_obj, state;

    form_dial(FMD_START,0,0,0,0,sx,sy,sw,sh);
    objc_draw(box,ROOT,MAX_DEPTH,sx,sy,sw,sh);
    finished = FALSE;
    pressed = FALSE;
    do
        {
        graf_mkstate(&mx,&my,&b,&d);
        obj = objc_find(box,ROOT,MAX_DEPTH,mx,my);
        if (b != 0 && !pressed && obj != NIL && ((box+obj)->ob_flags & SELECTABLE))
            {
            click_obj = obj;
            state = (box+click_obj)->ob_state;
            objc_change(box,obj,0,sx,sy,sw,sh,state|SELECTED,1);
            pressed = TRUE;
            }
        if (b == 0 && pressed)
            {
            objc_change(box,click_obj,0,sx,sy,sw,sh,state & ~SELECTED,1);
            pressed = FALSE;
            if ((box+click_obj)->ob_flags & EXIT)
                finished = TRUE;
            }
        }
    while (!finished);
    form_dial(FMD_FINISH,0,0,0,0,sx,sy,sw,sh);
}

/*
** Listing 2.
** Programmers' Forum STA 37 (January 1994)
**
** Replacement version of the do_dialogue()
```

```
** function from Listing 1, suitable for use
** by desk accessories.
**
** Compiler system: Lattice C v5.51
** Compile options: Phase 1: -cargfku Phase 2: -ms
** Optimisable: Yes
** Link with CACC.O, LCG.LIB and LC.LIB
** Written on 14th June 1992
*/

/*
** Function to handle the display of the program's
** dialogue box.  The data for the resource file is
** in the assembler module, and it should be fixed
** up before use.  There are no arguments and no
** returns.
**
** Usage:   void do_dialogue(void);
*/

void do_dialogue(void)

{
    int finished, pressed;
    short mx, my, b, obj, click_obj, state;

    form_dial(FMD_START,0,0,0,0,sx,sy,sw,sh);
    objc_draw(box,ROOT,MAX_DEPTH,sx,sy,sw,sh);
    finished = FALSE;
    pressed = FALSE;
    wind_update(BEG_MCTRL);
    do
        {
        vq_mouse(VDI_handle,&b,&mx,&my);
        obj = objc_find(box,ROOT,MAX_DEPTH,mx,my);
        if (b != 0 && !pressed && obj != NIL && ((box+obj)->ob_flags & SELECTABLE))
            {
            click_obj = obj;
            state = (box+click_obj)->ob_state;
            objc_change(box,obj,0,sx,sy,sw,sh,state|SELECTED,1);
            pressed = TRUE;
            }
        if (b == 0 && pressed)
            {
            objc_change(box,click_obj,0,sx,sy,sw,sh,state & ~SELECTED,1);
            pressed = FALSE;
            if ((box+click_obj)->ob_flags & EXIT)
                finished = TRUE;
            }
        }
    while (!finished);
    wind_update(END_MCTRL);
    form_dial(FMD_FINISH,0,0,0,0,sx,sy,sw,sh);
}

/*
** Listing 3.
** Programmers' Forum STA 37 (January 1994)
**
** Module containing functions for capturing data
** from the MIDI port.  Some of the functions may
** be somewhat difficult to port to other compilers
** as they depend on the superb flexibility of the
** Lattice C runtime model.
**
** Compiler system: Lattice C v5.51
** Compile options: Phase 1: -cargfk Phase 2: -ms
** Optimisable: No
** Link with: C.O and LC.LIB
** Written on 3rd July 1992
*/

#include <osbind.h>
#include <portab.h>

/*
** Declarations for objects visible from outside
** the module.
*/

typedef struct
    {
    unsigned long mb_start;
    unsigned long mb_end;
    short mb_valid;
    unsigned char *mb_buffer;
    } MIDI_BLOCK;

void start_capture(MIDI_BLOCK *);
void end_capture(void);
int is_capture_finished(void);
unsigned long bytes_captured(void);


/*
** Declarations for private functions...
*/

static void __asm __saveds MIDI_capture(register __d0 unsigned char);

/*
** Declare the private module global variables...
*/

static void *oldMIDI;                   /* Pointer to old MIDI handler      */
static void **vectors;                  /* Pointer to Kbdvbase table        */
static short installed;                 /* TRUE if capture system running   */
static short capture_finished;          /* TRUE if last block has been got  */
static unsigned long bytes_received;    /* Number of bytes received         */
static MIDI_BLOCK *block;               /* Pointer to array of block specs  */


/*
** Function to install and initialise the MIDI
** data capture system.  The argument is a pointer
** to an array of MIDI_BLOCK structures, the end
** of which should be marked by an element containing
** a NULL buffer pointer.  There are no return values.
** Attempting to install the system twice has no effect.
**
** Usage:   start_capture(specification_list);
**
**          void start_capture(MIDI_BLOCK *);
*/

void start_capture(list)

MIDI_BLOCK *list;

{
    MIDI_BLOCK *mbptr;

    if (!installed)
        {
        installed = TRUE;
        bytes_received = 0L;
        block = list;
        capture_finished = FALSE;
        for (mbptr=list; mbptr->mb_buffer != NULL; mbptr++)
            mbptr->mb_valid = FALSE;
        vectors = Kbdvbase();
        oldMIDI = *vectors;
        *vectors = MIDI_capture;
        }
}


/*
** Function to remove the capture system from
** the MIDI vector.  This MUST be called before
** program termination.  If the capture system
** is not installed, there is no action.
**
** Usage:   void end_capture(void);
*/

void end_capture(void)

{
    if (installed)
        {
        *vectors = oldMIDI;
        installed = FALSE;
        }
}


/*
** Function to determine whether the capture list
** has been satisfied yet.  Returns TRUE if so,
** FALSE if not.
**
** Usage:   result = is_capture_finished();
**
**          int result, is_capture_finished(void);
*/

int is_capture_finished(void)

{
    return(capture_finished ? TRUE : FALSE);
}

/*
** Listing 4.
** Programmers' Forum STA 37 (January 1994)
**
** Code fragment showing how to use the MIDI
** capture code.
**
** Compiler system: Lattice C v5.51
** Compile options: Phase 1: -cargfku Phase 2: -ms
** Optimisable: Yes
** Link with: C.O, LISTING3.O and LC.LIB
** Written on 3rd July 1992
*/

#include <portab.h>
#include <time.h>

#define TIMEOUT 60                      /* Timeout dump after 60s           */

/*
** Buffers to write the captured blocks into.
*/

unsigned char buffer1[16];
unsigned char buffer2[256];
```

```
/*
** List of blocks to be captured.  MIDI_BLOCK
** is specified in capture module listing - either
** repeat declaration here, or better, incorporate
** it into a header file.
*/

MIDI_BLOCK block_list[] {
                          { 16, 31,FALSE,buffer1},
                          {512,767,FALSE,buffer2},
                          {  0,  0,FALSE,NULL}
                        };

        .
        .
        .



/*
** Function to handle the MIDI capture process.  It
** initiates a capture with the specified block list,
** waits until the data has been accumulated, or a
** fixed time has elapsed, then returns TRUE if all
** proceeded OK, or FALSE on a timeout.
**
** Usage:   result = get_MIDI_data();
**
**          int result, get_MIDI_data(void);
*/

int get_MIDI_data(void)

{
    time_t countdown;
    int result;

    result = TRUE;
    start_capture(block_list);
    countdown = time(NULL);
    while (!is_capture_finished())
        if (time(NULL) >= countdown + TIMEOUT)
            {
            result = FALSE;
            break;
            }
    end_capture();
    return(TRUE);
}
```

```
/*
** Function to allow access to the number of
** bytes captured.  Returns the current value
** of the internal counter variable.
**
** Usage:   count = bytes_captured();
**
**          unsigned long count, bytes_captured(void);
*/

unsigned long bytes_captured(void)

{
    return(bytes_received);
}


/*
** Function to receive and save MIDI bytes into the
** appropriate buffer.  This will be called in supervisor
** mode by TOS upon receipt of each MIDI byte. The
** byte will be passed in d0.  The function should return
** with an RTS and is allowed to change any registers
** it likes.  The function relies on the array of MIDI_BLOCKs
** being correctly sorted. There are no return values.
**
** Usage:   <Called only by system>
*/

static void __asm __saveds MIDI_capture(register __d0 unsigned char input)

{
    if (block->mb_buffer == NULL)
        capture_finished = TRUE;
    if (capture_finished)
        return;
    if (bytes_received <= block->mb_end)
        {
        if (bytes_received >= block->mb_start)
            *(block->mb_buffer + bytes_received - block->mb_start) = input;
        }
    if (bytes_received == block->mb_end)
        {
        block->mb_valid = TRUE;
        block++;
        }
    bytes_received++;
}
```


X-Debug

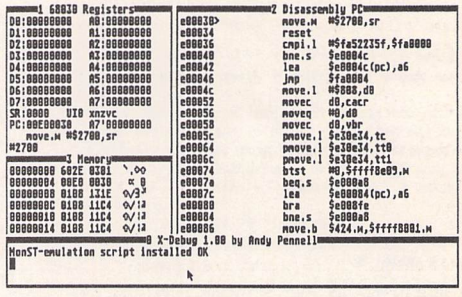
Advanced Debugger for Atari ST/TT computers

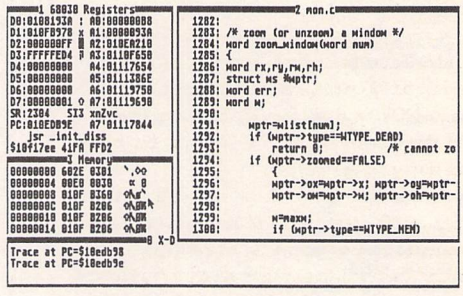
X-Debug is an advanced debugger for the Atari range of computers. It is both a low-level debugger, showing memory dumps and register contents, and also a medium-level debugger, understanding about certain high-level languages and allowing source display single-step, and local variable access, for example.

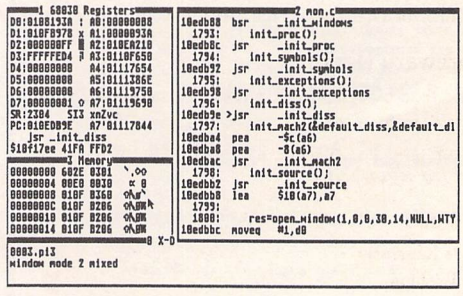
The best support is for Lattice C, as that is the only compiled language that outputs full debug information, but it also supports line-number debug (as created by HiSoft Basic and Devpac 3), and symbol-only debug (usable with virtually all ST compilers).

Crucial to the whole debugger is the X-Debug language. This is a simple yet powerful script type language that allows complex operations to be built up from a sequence of standard operations. It supports a full expression evaluator, aliases, and procedures with parameters. It is also an important factor in customising the user interface, allowing specific commands to be attached to particular keypresses.

X-Debug runs on STs and TTs with any monitor type. One megabyte of RAM is recommended, and TOS 1.4 or later avoids problems with larger programs. Written by Andy Pennell, the creator of MonST.





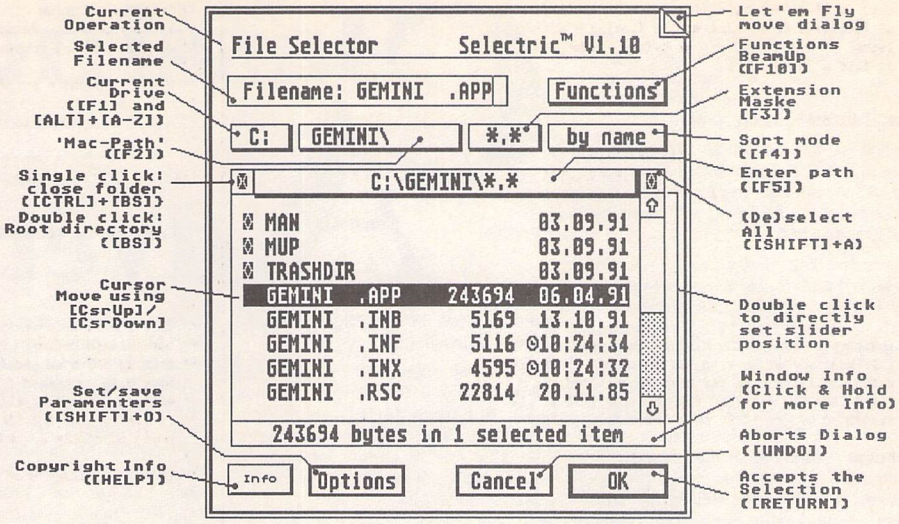


£24.95

The ST Club
2 Broadway
Nottingham
NG1 1PS

CAD Column

Joe Connor announces another Falcon compatible Shareware product and asks for your continued support...



I've used UIS since 1989 and had happily come to overlook its idiosyncrasies because it was the best productivity utility around. Faced with a stylish alternative which uses pop-ups, flying dialogs and neat option buttons I was forced to think again. Maybe you've got used to the strange method of accessing the alternative extension filenames - does '[right button down]+[left mouse click] on the leftmost extension' really seem normal to you? Maybe you even got used to the odd idea of hiding the most important Option dialog under the title bar? Or maybe, like me, it was simply all too much and you only ever found or remembered half the options.

Selectric (with typical Teutonic efficiency) doesn't bother hiding things away; if you want Options you click on the Options button, if you want to set a file extender click on the extenders pop-up and so on. Call me fickle if you like but this seems like a sensible approach to me.

Ah yes, but does it...?

I followed my normal procedure of taking screenshots of each interesting Selectric dialog but there were so many I had to leave most of them out! Everything you could want in a File Selector is available. Here's a few of the nicer less obvious features:

The Auto-Locator: has it ever occurred to you whilst scrolling through file lists there ought to be a better way to find a file? Often you can even partially remember the filename? This is what the Auto-Locator attempts to do. When Selectric is called it tries to find, and highlight, any filename(s) passed by the calling application. Additionally, as you manually enter characters into the 'Filename' field, the Auto-Locator continually refines its selection. When the desired file is highlighted simply hit the Return key to select it; often a single letter is enough!

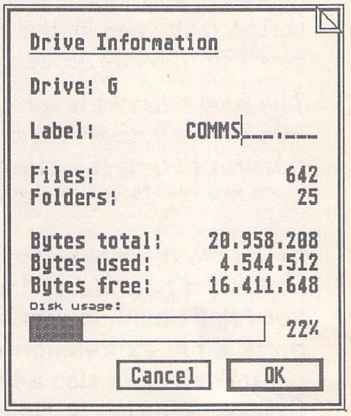
Another example showing how Selectric does the thinking for you is when you open a folder and close it again the slider remains where you left it, instead of returning to the top!

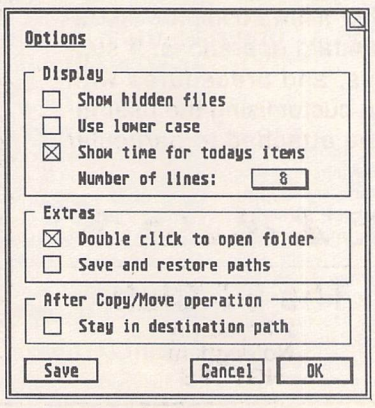
Most of the functions can be keyboard controlled and the author recommends the installation of Let 'em Fly! to take care of the dialog boxes.

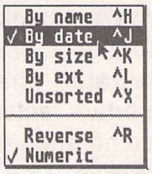
Extended Unix-style Wildcard entries are supported which will probably appeal to users who know what to expect when they enter lines like: '*MOUSE*.[A-Z]??'

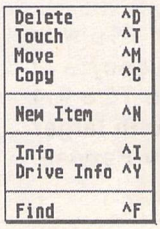
Selectric works on all post-ST Atari models with any graphic card and is fully Falcon and MultiTOS compatible.

And the catch? Well, there must be one mustn't there? Selectric can only display 8 files on a standard ST. It's not in the same league as UIS and in response to demand the author is working on a new version. In the meantime he's added a user-definable option to increase the number of files displayed up to a maximum of 24 in TT high. It certainly doesn't bother me, as the slider moves smoothly up and down the file list in real time and the other features easily outweigh this minor (and temporary) shortcoming.









Selectric Registration

Try the Shareware version from the ST Club on disk UTI.323.

If you would like to register:

a) Make a cheque for £13 payable to J. Connor

b) Be sure to include your Surname, Forename and address.

c) If you would prefer to have your Key number Emailed or Telephoned please enclose your details.

d) Send to: 65 Mill Road, Colchester, Essex.

Please do NOT send cheques for Shareware supported by this column to the ST Club as this causes unnecessary postage charges.

Cheques are held until I have approximately ten cheques. At this stage I cash all the cheques and send the money to Stefan who sends out the Keys.

Registered users can at any time send (to my address) a Stamped Addressed Envelope enclosing a double-sided disk for a free copy of the latest version.

Shareware Report

At the time of writing this report I've received 25 registrations for Kandinsky, around 10 from CIX and the rest via ST Applications. Not bad but I'm expecting better this month!

Versions

V1.57e Kandinsky
V6.6 Winlupe
V1.10 Selectric

Classified Adverts

For Sale

Citizen 1200 9-pin dot matrix printer complete with parallel lead and mains lead, 2 ribbons also included. Good condition in original box, ideal first buy: £40. Tel: 0257 252875. (38)

HiSoft 'C' Interpreter £20, Microprose Grand Prix £15, Digita Home Accounts £7. ST Assembly language workshop book vol. 1 £6. All boxed with manuals. Tel: Dave on 0602 397354. (37)

Speedball 2 & Cadaver (boxed together) £25, Super Space Invaders & Pit Fighter (together) £25, Robocop 2 £15, Lemmings £15, Manchester United £10, Borodino £5, Defender of the Crown £3, Dungeons, Amethysts, Alchemists £3. All in original packaging with manuals. Also: STOS Basic, STOS Compiler, STOS Maestro sound module, STOS Sprites 600 sprite collection. All are unused and unregistered, in original packaging with manuals and user registration cards: £50. Also: DeLuxe Paint ST, unused and in original packaging with manual: £30. Tel: 021 358 2843. (37)

Mega ST 4MB Ram fitted; 20MB Seagate hard disk with ICD Ad-Speed interface; EOS TOS operating system; Overscan fitted for extra screen area - all installed in Lighthouse Tower case; SM124 monitor; software loaded includes: First Word Plus v3.15, PageStream 2, Superbase Professional, K-Spread 4, Technobox CAD, Neodesk 3 and Harlekin 2. All original manuals etc. supplied. This is a thoroughly reliable system, so try an offer around £450. Also available: Spectre GCR Macintosh emulator inc. ROMs: £100; Turbo 16 v2.0 16MHz processor upgrade, unused: £70; AT-Speed PC emulator and Speed-Bridge for Mega ST fitting: £50. Everything must go so ring with your best (sensible) offers or for an appointment to view. Phone Nigel on 0372 274410 (Surrey). (38)

Atari ST computer £50; Philips CM33 colour monitor £100; 80Mb Supra drive £150; Supercharger PC emulator + DOS £100. Microtext teletext adaptor £60; plus lots of serious software & books. No games. Phone Horsham (0403) 262472. (38)

Atari STFM 2.5MB £150, Progate 30 Hard drive £120, SM125 mono monitor £60, Forget-Me-Not clock £10, V21/23 modem £25, Rombo complete colour solution £50, STOS Maestro £20, Protext v6 (latest version) £60, plus many original software titles too many to list. Southampton (0703) 867640. (38)

STFM 2.5 Meg, 50 Meg hard drive, mono/colour monitors, hand scanner, second disk drive, monitor switch box; PageStream v2.1, Timeworks 2, That's Write v1.5, GFA Draft v3.0, Diamond Edge, XBoot, Master CAD, lots more. Games and PD disks. All must go. Offers to 0837 86435 evenings. (38)

ST books all in good condition: Glentop - Using ST Basic, 1ST Publishing - Tricks and Tips, Graphics and Sound, other publishers: 68000 assembly language, Assembly Language Programming for the 68000, Program Design Techniques; zzSoft - Introducing ST machine code (with disk): £5 each or £25 the lot. Abacus - 3D graphics, Basic Training Guide, Disk Drives Inside and Out, GEM Programmers' Reference, Machine Language, ST Internals. Kuma - Atari ST Explored. Sigma - Advanced Programmers' Guide: £5 each or £30 the lot. 97 Lincoln Rd, Fratton, Portsmouth PO1 5BQ. (37)

Golden Image mouse, Zip-Stik joystick, Superbase Personal, Signum Script WP, Flight Sim. 2 + scenery disks, F19 Stealth Fighter, F15 Strike Eagle, Falcon + Missions, Airbus A320, Populous, Atari ST User and ST Format mags (+disks) in binders 1990-1993. Will split. Offers please: 081 673 0153. (38)

Infocom Adventure games software: Planetfall, Stationfall, Starcross, Infidel, Sorcerer, Ballyhoo, A Mind Forever Voyaging. All £6 inc. P&P. Tel: 031 445 1566. (38)

Atari STFM 1040 (boxed) £175. External floppy disk drive 83 tracks £25, GFA Draft 3.1 (manual & disks) £20. Flexi-Dump manuals and disks £15. Loads of others, magazines, PD disks and blank disks. No reasonable offer refused. Phone Stevenage (0438) 728124. (38)

Mark Williams C version 3 complete with source debugger etc. £30. FTL Modula 2 developer edition £25. Logistix Spreadsheet/graphics £25. K-Graph 3 £15. Personal Pascal £15. Monitor switch box £7. Tel Paul on 0772 797125. (38)

Tower system (separate keyboard) containing: 2.5MB STFM, TOS 1.4, 32MB hard drive, ICD host adapotor with on-board clock, two 1MB floppy drives, new colour monitor (approx. 20 hours' use), dot matrix printer, various business and games software, 100 PD disks (catalogued), computer workstation trolley. £450. Call Paul on 0308 424072 evenings. (38)

External 5.25" floppy drive Atari/PC switchable £25. Easydraw 2 £15, Fontkit Plus 3 £10, Knife ST £15 (all complete with manuals). Tel: 081 422 9099. (37)

Mega ST2, Blitter, Expansion Bus, etc. Atari SM125 Monitor. Progate 100MB Hard Drive. All excellent condition and boxed. Plus Software. Bargain £650 the lot. Tel 081-521 5271. (37)

I have a few brand-new books - Practical Logo for the Atari ST - RRP £8.95 for only £4.95 inc P & P or only £5.95 including the DR Logo Language Disc. Contact Nigel Vandyk on 081-349 4705 for further details. (37)

Redacteur Full Version £40; Proflight £15; Wordflair £20; Forget-Me-Clock £5: Tel 0494 - 436143 (Bucks). (37)

Atari STE 4MB + Second Drive + Gasteiner 52MB Hard Drive, Atari SM124 Monitor, large amounts of software, Neo-Desk 3, Hisoft Basic Ver 2, Harlekin Ver 2.04, GFA Draft and many more. Large collection of Mags, £500 the lot. Tel 0692-670133, anytime. (37)

1MB STE. PageStream V2.1 cost £119 new, 8 boxed games including Robo-

Authorware

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.

Morse Master

The complete morse trainer and simulator, with realistic 'on-air' emulator and integral editor, with complete control of your listening equipment. In addition to sending, your Atari can also receive and decode morse from your own key using the supplied interface cable. Send Cheque/PO for £29.99 payable to Boscad Ltd at: 16 Aytoun Grove, Balbridgeburn, Dunfermline, Fife, KY12 9TA. Telephone (0383) 729584 evenings for technical information.

STEN

ST ENthusiasts disk magazine - for your copy send a disk + SAE to: Dave Mooney, 14 School Road, Morningside, Newmains, Lanarkshire.

SynTax

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. Cheques made payable to S. Medley should be sent to: 9 Warwick Road, Sidcup, DA14 6LJ.

Clip Art

Clip Art specifically for Christian and Community Magazines. Seven disks of IMG images for DTP programs supplied with a printed picture catalogue of every image. Cost: £3 per disk plus P&P: total of £23 for the set. Cheques payable to: Peter Kempley, KemCom Designs, 21 Chart House Road, Ash Vale, Aldershot, GU12 5LS.

Calamus Manual

This self-tutorial guide incorporating sections on frame drawing, entering text, changing fonts and styles, importing text and images, drawing boxes and lines, loading, saving, printing, text rulers, headers and footers and page numbers. Available at £5 (including postage) from: David Waller, The Sandon School, Molram's lane, Great Baddow, Chelmsford, Essex, CM2 7AQ. Cheques should be made out to 'Sandon School'.

Genealogy

Newgen, my genealogy program, runs on any ST(E) or TT and is easy to use; it will print family trees, etc. Send large SAE for details or £17 for program. E G Richards, 2 Peckarmans Wood, London SE26 6RX.

Educational Adventures

For ages 5-13. 88% in ST Format. £12 each. 50p per disk for demo's. CVS, 18 Nelson Close, Teignmouth, TQ13 9NH. Tel: (0626) 779695.

Sonix Sound Sampling

We will sample your sounds from tape to disk. Ideal for demos, games and your own programs. 3-day turnaround guaranteed. Write for free details to: The Lodge, Delly End, Hailey, Witney, Oxon, OX8 5XD.

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For demo, just send 4 first class stamps OR s.a.e. + disk.

Circuit Designer

Create good quality circuit diagrams quickly and easily. Comes with laser printed manual. Works with any ST or STe computer with monochrome monitors. Costs only £7.00: Send Orders to:

Darren P. Goodwin, 4 Coniston Drive, Bolton on Dearne, Rotherham, S. Yorkshire S63 8NE.

STTrack

Use up to four light beams with your ST. Measure speed and acceleration. Write data to disk for spreadsheet. Invaluable for science National Curriculum AT4. High resolution only. Software and manual with full details £20. Cheques payable to:

F.J. Wallace, 9 High Elms Road, Hullbridge, Essex SS5 6HB.

Scanner Manager

A specialised database system for all scanner owners, this software has been designed to be very easy and quick to use. For further details contact: Stuart Coates. 9 Links Road, Kibworth Beauchamp, Leicester LE8 0LD.

Graph, Euclid and Stack

GRAPH can draw simple functions, implicit functions, parametric and polar functions and display the gradient functions of any of these. It will also display the solutions to first order differential equations and do a simple plot of complex functions. The zoom facility can also be used to find

cop 3, F19– Stealth Fighter and Lemmings 2, 10 ST Format magazines containing coverdisks with £200 + software. 30 + PD Disks, Joysticks, 9 ST Applications magazines. All for £300. Will split – Open to offers. Call Jonathan 0222 757022. (37)

Low cost hardware and software with original manuals & packing! 1Mb STFM with SM124 monitor and second drive £150, Calamus 1.09 with extra fonts £50, Fleet Street Publisher version 3 £25, Didot Line Art with Bezier curve tracer £40, Convector curve tracer £30. Near offers considered; please ask about other items. Tel: Watford (0923) 266636 evenings. (38)

Protar Host Adaptor (inc. DMA Cable to connect adaptor to ST & SCSI cable to connect hard drive to adaptor). In perfect condition with software. To make use of this you will need an SCSI Hard Drive and a power supply and possibly a fan – £40 (worth £100), I will pay postage. David Haider, 061–764–2442 between 4pm and 10pm. (38)

Gajits Breakthru Midi and Sample Sequencer, Drum Grid, Score Editor STE DMA Sample output or any Microdeal sampler, STFM Monitor Output, 8 16 Bit, mono samples. 64 Track, needs 1Mb Mono & Colour Display. Cost £130 sell £60. Tel Jon 0323 500910. MS DOS to work with P.C. Ditto Wanted. (37)

Police Quest 2, Hyperdraw, Intro to Sound & Music – £5 each. Phone Paul 0962 854726. (37)

Steinberg Pro 24 III Brand new, unopened £35 including postage. Michtron Utilities Plus £15 including postage. 0257 272119. (37)

ST Magazines: Atari ST User Jan 88 – July 90 (most issues) plus odds 91/92. Total 31 Mags. Atari ST World Oct 87–Dec 90 (issues 20–52) complete set barring 3 issues (Total 30). A few ST Format also, offers? (Buyer pays carriage!) Call Jon or Jeff (0992) 574973. (37)

Protar 50 DC Series 11 Hard Drive – £230. Philips CM8833 MK II Colour Monitor – £130. Tel 0903 690142 Evenings. (37)

That's Write 2.07 with DeskJet Special Disc £40, PageStream 2.2 Assistant £16, Data Manager Professional £15, Superbase Personal £13, K-Graph 3 £5, K-Spread 3 £5, Users' Guide to Timeworks £4, Atari ST Internals £6. Tel Chris 0272 781178. (37)

1MB STFM, Colour Monitor, 85MB Hard Disk, modem, 75+ magazines and over £1500 of software. Worth over £2300 in total, sell for £950. Write to Peter Strath, 75 Cavendish Road, Highams Park, London E4 9NQ. (38)

Mega 4 STE for sale. 16MHZ CPU, CAHCE RAM, 57 meg Internal hard disk, Vortex 386 PC hardware emulator with own fast and cache RAM. Separate high quality keyboard, VME bus, 3 serial ports. Almost new. All offers considered. Ring Adam (081) 989 9672. (37)

68882–16 Coprocessor for Falcon, new £49, TOS 2.06 kit incl. Roms, requires soldering: £39; Books – Abacus ST Tricks & Tips £6, Compute's Tech Ref. Guide ST TOS £9, ZZSoft Intro. Machine Code (incl. disk) £10, Glentop using ST Basic £1. Phone 0224 86 9558 after 6.00pm or weekends. (38)

Gasteiner Hard Disk (Seagate 50Meg) 1 year old, Internal Clock, ICD Host Adaptor and software, Plus Neodesk 3, Ultimate Virus Killer 5.9 and Useful PD Software – £200. Civilization, Monkey Is, Loom £10 each. Maniac Mansion, Zak McKracken £5 each. Wonderland £8, Cadaver £5, Deja Vu, Shadowgate, Uninvited £10 the lot. 021 429 8153 after 6pm (Birmingham). (37)

Atari ST User magazines, May 87–Aug 91. 50p each + p & P. Tel (0827) 330427. (40)

Automatic Sheet Feeder for Panasonic Dot Matrix Printer KX–P1124, Complete with instructions – In very good condition. £40 ono. – Tel. 081–330–3531. (37)

Protext 5.53 – £40; Ultimate Ripper Cartridge – £10; Hyperdraw, Hyperpaint – £4.00 each; Robokit – £20. All + P & P; tel. 0722 334929. (37)

Wanted

Hand scanner for STE including software, also cheap hard drive and Lattice 'C' v5 (unregistered). Phone 0532 750563 and ask for Adrian. (37)

Calligrapher Professional (not Gold). Please phone Steve Hill on 0732 456537 with details of printer drivers and price required.

FM Melody Maker, any reasonable price paid. Contact Graham Nash on 071 234 5098 – 9am–6pm. (38)

Atari SM146 Hi–res Monitor and a copy of Script II. Tel 081–521 5271. (37)

Modem in good condition 2400 baud or faster. Will pay up to £50. Contact Jonathan on 0222 757022. After 4pm weekdays or weekends. (37)

Redacteur 3. Will swap complete authorised copy of Signum 2 including extras. Ring John on 031 226 7092 after 7pm. (37)

Atari Editor/librarian for Crumar/Chase Bit 01, or MIDI SysEx in order that I can make one. Will buy or swap. Please write to J. Gouveia, Rua Marques de Pombal 20, Alvor, 8500 Portim?o, Portugal. (38)

Midi Mother Keyboard (No Sounds of its own) to work with Yamaha Midi Portasound Synth and Atari STE 1040 Micro. Tel 0745 825 036 anytime – Ask for Paul. (37)

General

I am deserting the Atari for the PC so I have loads of stuff to get rid of, willing to exchange for anything for the PC. 0983 615987 or 30 The Mall, Binstead, I.O.W. PO33 3SF. Wanted $3\frac{1}{2}$" Disks. (38)

Calamus 1.09 and S files printed on Laserjet 4; 300dpi at 20p per sheet; 600dpi at 30p per sheet. Send disk with fonts used, and a stamped addressed A4 envelope. Also very cheap litho printing A4/A5/business cards etc. SAE for price list & samples. Cheques to G. Franklin + S Russell, 67 The Avenue, Camberley, Surrey, GU15 3NF. (38)

Call the Fractal BBS. Loads of features and very friendly. 2400BPS after 9pm on 0305 266304.

The Bird Brain BBS – 0305 860245 10pm – 10am every night, all welcome. (43)

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My Little Phoney BBS (0793) 849044 – all speeds up to V32bis and HST. Specialist Atari ST BBS, carrying all Atari-relatedfidonet and Nest Echoes, and importing international ST file echoes (AFN/ADN). High speed and technically aware callers are especially welcome! (R)

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User Group

Are there any ST User Groups in Sussex or Surrey? Write Sydney Vale, 3 Albany Mews, Fourth Avenue, Hove, Sussex BN3 2PQ. (37)

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Demo disk of the above compart tutorial is now available. Please send a cheque/P.O. for £1 or a blank DS disk and an SAE to Keith Markland, 15 Stourton Road, Ilkley, W. Yorkshire LS29 9BG.

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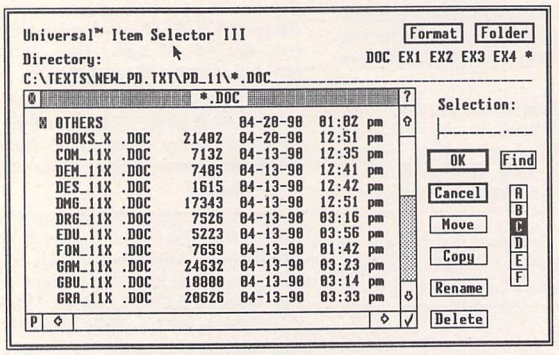

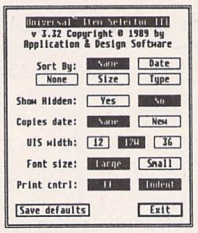

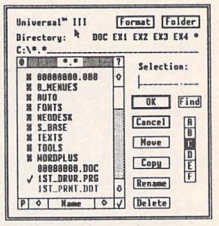

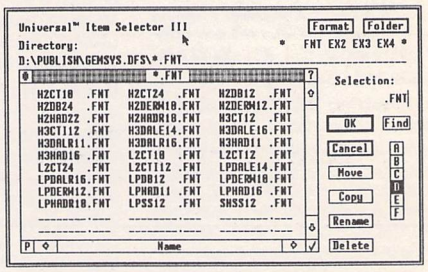

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Copies of issue 14 of the ST Club Catalogue will be mailed to subscribers over the last three weeks of December. We now carry four ranges of PD and Shareware disks and the new prices will take effect from January 1st 1994.

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Premier Disks (AB.123 - £1.25 ea.)

These disks contain the best and most popular titles that we have. For maximum value for money many of the files on these disks are compressed. Uncompressing the files is simple - we use the same methods as some magazine cover-disks and our Disk Mags.

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These disks are semi-commercial products (see 'What is PD Software' box in our catalogue) and we pay royalties to the authors of the programs on these disks. Licenseware disks have the disk code prefixes GBU, GBD, BPR, and LCW. These disks cost £2.75 each and are they are kept in stock so that we can offer a same-day despatch on orders for them.

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Version 14 of our catalogue describes all of the disks in our Premier range and the more popular disks in the Licenseware range. The disks in our Standard, Licenseware and ST Computer ranges are described in two disk based catalogues - see order form for details.

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Warning: It is illegal to sell unauthorised copies of commercial software - All software offered for sale must be in the original packaging with manuals etc. Anyone found to be selling pirated software through the classified advert listings will be reported to the appropiate authorities. Software publishers do not normally offer user support or upgrades to users of software purchased second hand.

ST Club Product News

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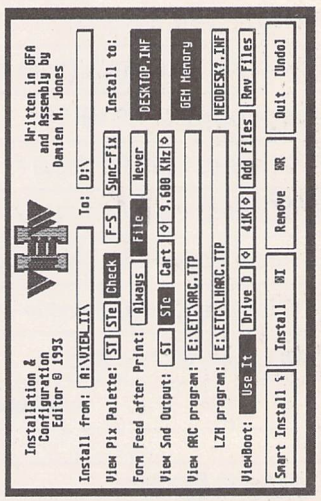

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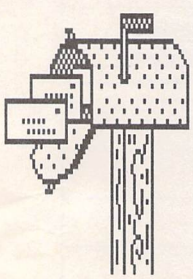

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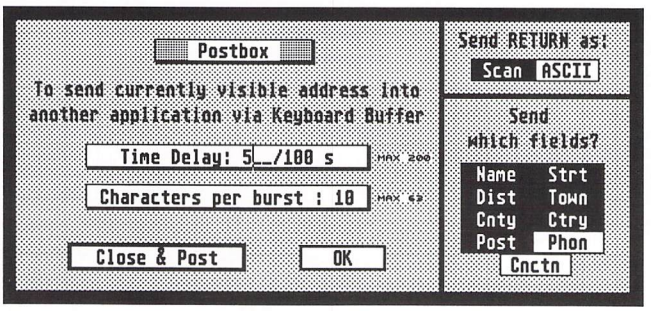

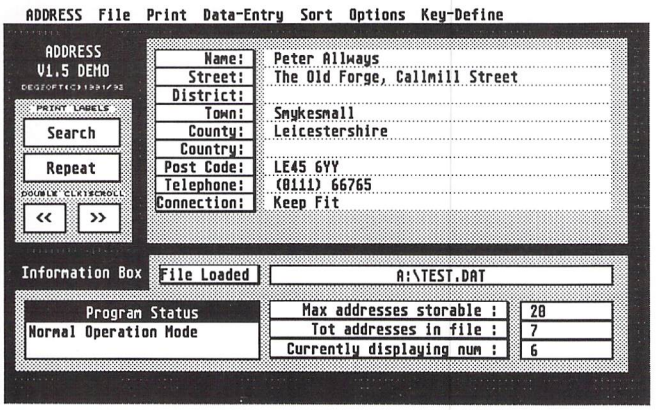

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